This document contains transcripts of papers and panel discussions of a workshop conducted in Texas on the integration of academic and vocational education. The following papers and sessions are included: "Integrated Curriculum and Performance-Based Education: A Strategy for Systemic Change" (Jerry D. Pepple); "Toward the Integration of Vocational and Academic Education: A Group Process"; "An Overview of Integrating Vocational and Academic Education" (Michelle Sarkees-Wircenski); "Texas Education Agency Symposium"; "Setting the Stage for Integration at the Local District Level" (Mary W. Hendrix); "Integrating Technology Education and General Education" (Cam O'Keefe and others); "Principles of Technology: The Marriage of Academic and Vocational Education at Leander High School" (Mark Kincaid); "Physics-Technology Integration" (Tony Bertucci); "Mathematics Skills Meeting Vocational Needs" (Don Westbrook, Sherri Frost); "Developing Integrated Curricula" (Jerry Wircenski); "Evaluation of Programs that Integrate Vocational and Academic Education" (Jerome T. Kapes); "8th Grade Pre-Vocational Program for At-Risk Students" (Dianne Petty, Lolly Flores); "Integration of Academics and Vocational Education 'West of the Pecos Style'" (Steve Forsythe); "Incorporating Language Arts into Vocational Classrooms" (Debbie Johnson, Rebecca Miller); and "Closing Remarks" (Patricia S. Lynch). Also included in the report are a summary of the Texas State Board of Education Long-Range Plan, the workshop evaluation, a list of participants, and 46 references.
Integrating Academic and Vocational Education

Workshop Proceedings
April 18-19, 1991
Marriott at the Capitol
Austin, Texas

Compiled by
Patricia S. Lynch
Research Associate
and
Linda H. Parrish
Project Director

Sponsored by
Vocational Special Needs Program
Texas A&M University
and
Texas Education Agency

BEST COPY AVAILABLE
These proceedings from the Integrating Academic and Vocational Education Workshop were compiled pursuant to a contract with the Texas Education Agency's vocational education program division. Contractors or grantees undertaking such projects under Agency sponsorship are encouraged to freely express their professional judgement in the conduct of the projects. Points of view or opinions stated do not, therefore, necessarily represent official Texas Education Agency position or policy.
About the Workshop

This workshop was conducted as part of a Texas Education Agency funded project entitled Vocational and General Education Personnel Training. The project was designed to address the current issues of the integration of vocational and academic education, and one of the objectives was to conduct a statewide workshop on integrating academic and vocational education. Superintendents in all school districts in Texas were sent letters informing them of the workshop and asking them to provide the Vocational Special Needs Program at Texas A&M University with names of interested persons within their district. Each district was encouraged to send a team of educators, representing both vocational and academic education. The workshop was designed to provide some information regarding research in the area of integrating academic and vocational education and some examples of ways schools in Texas were integrating the two. It was hoped that then the teams could return to their districts and begin to implement some integration strategies there. What follows are the proceedings from the workshop.
Table of Contents

Foreword vii
The Vision viii

I. Integrated Curriculum and Performance-Based Education: A Strategy for Systemic Change 1

II. Toward the Integration of Vocational and Academic Education: A Group Process 49
   Nominal Group Technique 50
   Barriers to Integration 51
   Solutions to Barriers 54

III. An Overview of Integrating Vocational and Academic Education 57

IV. Texas Education Agency Symposium 65

V. Setting the Stage for Integration at the Local District Level 67

VI. Integrating Technology Education and General Education 72

VII. Principles of Technology: The Marriage of Academic and Vocational Education at Leander High School 79

VIII. Physics - Technology Integration 81

IX. Mathematics Skills Meeting Vocational Needs 84

X. Developing Integrated Curricula 94

XI. Evaluation of Programs that Integrate Vocational and Academic Education 96

XII. 8th Grade Pre-Vocational Program for At-Risk Students 99

XIII. Integration of Academics and Vocational Education "West of the Pecos Style" 124

XIV. Incorporating Language Arts into Vocational Classrooms 126

XV. Closing Remarks 132

XVI. Workshop Evaluation 134
XVII. Appendices

Appendix A: Workshop Participants 136
Appendix B: Texas Education Agency Staff 141
Appendix C: References 144
Appendix D: Miscellaneous 149
Acknowledgements

Many people helped in the implementation of this project. We would like, first of all, to thank our advisory committee, whose input and guidance helped shape the two day workshop. Members were Jay Eudy, Texas Education Agency; Judy Hetherly, Texas Education Agency; Susan Kemp, Austin ISD; Bobby LaBouve, Texas Education Agency; Margaret Lindsey, Austin ISD; Eleanor Mikulin, Texas Education Agency; and Cathy Seeley, Texas Education Agency.

We would also like to thank the others, in addition to our advisory committee, who provided their services at the workshop and helped ensure its success: Laurel Flanagan, Spring ISD; Dinnah Funderberg, Texas A&M University; Rick Hernandez, Texas A&M University; Neil Jeter, Texas Education Agency; Linda Patton, Texas A&M University; and Rae Wyatt, Spring ISD.
Foreword

With the reauthorization of the Carl Perkins Vocational Education Act, there is a focus on integrating academic and vocational education. Educators realize that not only are both aspects of a student's education important, but that the integration of the two, with a coordinated effort, can increase the effectiveness of the student's education. A student entering a job not only needs to be able to understand the technical aspects of his or her job and perform the specific skills, but also to be able to write and read memos, to converse effectively with employers and co-workers, and to calculate his or her hours.

The Integrating Academic and Vocational Education Workshop was designed to address these issues. The proceedings of that workshop are presented here, arranged in order of their occurrence at the workshop. Each session is identified by a cover page and notes, handouts, and/or overheads presented by each speaker are presented.

The first session was a keynote address by Jerry Pepple from the University of Illinois. That was followed by a group session, involving the nominal group technique, which generated a list of barriers to integration as well as solutions to these barriers.

The third session was another keynote address by Michelle Sarkees-Wircenski from the University of North Texas. That was followed by a Texas Education Agency Symposium, with Grace Grimes and Robert Patterson as speakers. The next ten topics were presented simultaneously in round table sessions.

Also included in this handbook are a summary of the workshop evaluation and appendices with information pertinent to the workshop.
The State Board of Education of Texas envisions a state whose first priority is its children. The vision of this Board of Education, therefore, is limited neither to schools as they currently exist nor to education.

The society in which Texas' children develop into Texas' leaders must provide enrichment and nourishment for their minds and bodies, high expectations for their future potential, and recognition of their current demands. Such a society will ensure that infant and child care are secure and attentive and that parents have the resources to meet their children's intellectual, physical, and social needs.

Texas schools will welcome children who, because of their experiences prior to entering school, are ready to learn. They will provide programs to parents who need literacy, job training, and parenting skills. They will be located on campuses, community centers, and job sites. They will be equipped with the technology that promotes effective learning and efficient management.

The public education system will take the lead in ensuring coordination and provision of the services that children and their families need in order for children to succeed in school. Schools will not succeed, however, if they act alone. Attaining this vision demands the concerted and coordinated dedication not only of educators but also of all of those who interact with children and who share responsibility for their growth and welfare. These include parents, teachers, and other direct care providers, members of the health care, human services, and judicial and legal systems at the local, state, and federal levels, as well as neighbors, employers, and other community and business members.

This theme of mutual effort on behalf of children pervades this Long-Range Plan. Public education is responsible—and will be held accountable—for providing the multiple appropriate instructional environments, effective materials, qualified staff, and suitable facilities that yield student achievement. The State Board of Education recognizes, however, that too many children enter school less ready to learn and less healthy than their peers. Too many children suffer from deprivation and low expectations which jeopardize their ability to achieve. The need for common effort is great.

With this effort, the Texas public education system will be one in which:

* Schools vary widely in practice, site, and curriculum delivery in response to the needs of their students.

* Teachers have the responsibility, training, and the resources to guide developmentally appropriate instruction efficiently.

* Performance, rather than process, determines advancement.

* Performance and socioeconomic status are unrelated.

* Adults can enhance their job and life skills.

The future of Texas—social, economic, and environmental—depends upon the quality of its educational system. The quality of our lives and that of our children requires the strongest...
possible commitment to this future. The State Board of Education rallies all Texans to join
in being advocates on behalf of our children.

*From Quality, Equity, Accountability: Texas State Board of Education Long-Range Plan
for Public Education, 1991-1995*
Summary of Goals

Goal 1: Student Learning. All students will achieve their full educational potential.

Goal 1 emphasizes closing the achievement gap between populations of students, eliminating the gap between students' performance and their potential, and reducing the dropout rate through a variety of means. State actions include raising expectations, eliminating legal and regulatory barriers to student progress, expanding early childhood programs, and advocating integrated social services.

The key role of regional education service centers throughout the plan is to provide assistance to districts and campuses in meeting each goal. Suggested district and campus actions include expanding early childhood and before- and after-school programs, coordinating ancillary services with communities, and mainstreaming special education students.

Goal 2: Curriculum and Programs. A well-balanced and appropriate curriculum will be provided to all students.

Goal 2 focuses on meeting the curricular and program needs of all students, regardless of learning style, level of performance, or special abilities or needs. This goal also addresses lengthened school day and year. Key state actions include reviewing and revising the curriculum, providing incentives for a lengthened school day and year, encouraging alternative school configurations, and attending to special programs.

Districts and campuses are encouraged to focus on instruction, to integrate technology, and to adapt the state curriculum for local needs.

Goal 3: Personnel. Qualified and effective personnel will be attracted and retained.

Goal 3 focuses on preparation of all personnel, recruitment and retention of teachers, and on enhancing the responsibility of campus staff. State actions include monitoring certification programs, implementing teacher and administrator evaluation systems, increasing teacher salaries, and providing other incentives for recruitment and retention.

Districts and campuses are encouraged to involve teachers in decision-making, to help teachers vary instruction and provide other staff development, and to implement the induction year program. Colleges and universities are urged to prepare prospective teachers and administrators to help students master the state curriculum and to share in campus decision-making.

Goal 4: Organization and Management. The organization and management of all levels of the educational system will be productive, efficient, and accountable.
Goal 4 emphasizes management and performance of the educational system and accountability. State actions focus on performance-based accreditation, coordinated planning, implementation of the Public Education Information Management System, other services to support and improve local management, and methods for increasing local authority. Suggested district and campus actions include developing school-based decision-making councils, applying for waivers to rules and laws, improving curriculum and services in small districts, and training school board members.

**Goal 5: Finance.** The financing of public education will be adequate, equitable, and efficient.

Goal 5 focuses on adequacy, equity, and efficiency of funding for a quality education program, including funding necessary variations in programs and providing funds for facilities. In addition to increased funding, State Actions support funding incentives to encourage efficiency, coordination of federal, state, and local funds, and maintenance of the integrity of the Permanent School Fund. Districts and campuses are encouraged to place priority on efficient use of funds for instructional quality and student progress.

**Goal 6: Parent Responsibility.** Parents will be full partners in the education of their children.

Goal 6 encourages parents to take responsibility for their children's education and provides for parenting education and adult literacy. State actions call for a plan for parental involvement and coordinating state services for parent training and adult literacy. Districts and campuses are asked to involve parents and children in school decision-making, offer adult literacy and parenting programs, provide or locate extended-day child care services, and train staff in involving diverse groups of parents. Parents are encouraged to convey the expectation that their children can learn and to take responsibility for encouraging their children's and their own continuing education.

**Goal 7: Community and Business Partnerships.** Businesses and other members of the community will be partners in the improvement of schools.

Goal 7 encourages cooperation with the private sector and community organizations. State actions encourage reciprocity between schools and the private sector, programs for out-of-school youth and adults, and partnerships between schools and community-based organizations. District and campus actions conform to these. The private sector is asked to encourage school-age employees to stay in school, to participate in educational planning, and to provide employees a re parents with release time to participate in parent responsibility activities. Community-based organizations are encouraged to coordinate with school activities for students and out-of-school youth.

**Goal 8: Research, Development, and Evaluation: Instruction and administration will be improved through research that identifies creative and effective methods.**

Goal 8 calls for a state research agenda and for applying research and technology to improve instruction and management. State actions address a research plan and clearinghouse, cooperative and longitudinal research, and implementation of technology. Districts and campuses are encouraged to examine research and to develop innovative practices. Institutions of higher education are urged to conduct cooperative research with schools and to incorporate research findings into the preparation of prospective educators.
Goal 9: Communications. Communications among all public education interests will be consistent, timely, and effective.

Goal 9 focuses on conveying policies and information on school, campus, and district performance, soliciting perspectives from the field, and recognizing achievements. State actions include expanding telecommunications and disseminating information on the performance of the educational system. Districts and campuses are asked to follow suit and to expand local recognition programs.

Integrated Curriculum and Performance-Based Education: 
A Strategy for Systemic Change

Jerry D. Pepple
University of Illinois

General Session
INTEGRATED CURRICULUM AND PERFORMANCE-BASED EDUCATION - A STRATEGY FOR SYSTEMIC CHANGE

APRIL 18, 1991

Dr. Jerry D. Pepple
University of Illinois
Department of Curriculum and Instruction
Champaign, Illinois

1991 Workshop on Integrating Academic and Vocational Education

Austin, Texas

(This presentation is based on an original paper presented by Drs. Dale A. Law and Jerry D. Pepple and presented at a conference on Integration at Greeley, Colorado, November 1990.)
INTEGRATED CURRICULUM AND PERFORMANCE-BASED EDUCATION - A STRATEGY FOR SYSTEMIC CHANGE

Integration of Curriculum

The U.S. Secretary of Education, speaking at the School to Work Transition Conference last May stated that integrating academic and vocational studies is a key "for all students". Noting current programs around the nation linking academic skills and vocational education, he further stated "early results suggest that far from being mutually exclusive, job training and academics can be mutually reinforcing. . . A new focus on the application of mathematics and scientific principles is a promising approach to both meeting the education goals and improving school-to-work transitions."

A recent joint policy statement by the National School Boards Association and the National Association of State Boards of Education stated that schools should broaden vocational education to include stronger academics and that broader vocational education curricula should reach all students, not just those in job training. The statement urged local educators to consider the changing job market, modern work technologies and new teaching methods.

President Bush, in an article published in Industrial Education (1990, March) said "I'd like to encourage you to think about ways to integrate vocational education with your schools traditional curriculum. . . ."

In addition to the government, politicians and business and industry supporting the concept of integrating academic and vocational education, other interest groups are also supporting the concept to some degree or another. Not, I might add, all for the same reasons.

Parents support the concept because they want the best possible education for their child so he/she can get into the best college and then succeed in a satisfying high paying job.
Academic teachers as represented by their national spokespersons and associations such as the National Council of Teachers of Mathematics are interested in using new procedures in teaching math so students can readily see the relationship between mathematical concepts and their application in the real world. Project 2061: Science for All Americans (1989) proposes new curricula for science, math and technology that are different from today's school curricula in two ways: 1) boundaries between traditional subject matter categories are softened and connections are emphasized; and 2) the amount of detail that students are expected to retain is considerably less than in traditional science, mathematics, and technology courses.

Charles Benson (1989), Director for the National Center for Research in Vocational Education, in testimony before the Senate Subcommittee on Education, Arts and Humanities in support of the new Carl Perkins Vocational Education Act reported that "the case for integration stands on three main-and somewhat interrelated-arguments: economic necessity; findings from the field of cognitive science; and social justice."

In terms of economic necessity, fundamental changes are occurring in the nature and structure of work, reducing the number of the very lowest level jobs and increasing skill demands at all levels. The proportion of jobs requiring a thinking, learning, analytical worker is rising and is expected to continue to rise, but the proportion of jobs based on repetitive acts, easily learned by imitation, is falling. Employees must have a greater ability to work in a more uncertain and non-routine environment and to interact with a wider variety of individuals.

To illustrate he used the example of welding. Welding is a traditional vocational subject. Not many academic teachers would claim welding in their realm of responsibility. But for a career in welding, he proposes that "students are likely to need computer literacy, metallurgy, blueprint reading, heat control, distortion control, as well as knowledge of new and emerging welding techniques, such as robotic welding, laser beam welding, plasma arc welding, arc brazing, resistance brazing, laser beam cutting,
carbon arc cutting, etc. These new knowledge areas and new kinds of skills appear to require enhanced academic background and an increase in process comprehension." (J. C. Papritan, "Trends in Welding Training in Vocational Education: The Curriculum, Parts I and II," Welding Journal, April/May, 1985) Students enrolled in agricultural education programs learn more than raising animals and planting seed. They study the total farm or agribusiness - animal husbandry, finance, management, marketing, safety and health - they investigate the total operation and not just one narrow occupational area.

From the field of cognitive Science, he reports that "Recent work by cognitive scientists suggest that for large numbers of people, possibly a majority of the student population, 'theoretical ideas' -- meaning reasoning power, skills in problem solving, skills in knowing how to learn in the workplace, the ability to plan, to anticipate and avoid difficulties in productive processes -- are taught most effectively when they are taught in a practical context."

He further reports that

"...learning by doing is an effective instructional strategy over a wider span of the measured ability spectrum than is traditional academic instruction based on lecture and text. Teaching theory in a practical context appears to offer much transferability from the study of instructional modules to the solving of problems in the workplace."

Cognitive scientists are now saying that for most people effective learning requires a context that matters to them. In particular, most learning (including learning in the workplace) takes place in ways quite different from the form it takes in schools: it takes place in groups and often requires cooperation, while most school-based learning is an individual activity; it relies on using both simple and complex tools, whereas school-based learning emphasizes thinking that is relatively independent of tools; and most importantly schools emphasize relatively abstract forms of learning disconnected from the "real worlds" of work, family and community -- as schools themselves are disconnected from these worlds -- rather than connecting learning to events, people, and
objects that have some meaning to them, like the tasks required on the job, the chores necessary around the home, or the activities connected to lives as community members and citizens (Resnick, 1987; Raizen, 1989).

Benson (1989) suggests that integration of academic and vocational education "is the best shot we have" for overcoming the form of social injustice that occurs by tracking students.

The division or separation between academic and vocational education did not exist in the early period of education in this country. During most of the nineteenth century, little specific vocational training was found in the public schools. There was a general belief that all students of every vocational ambition should learn the same subjects.

The manual training movement of the 1880's developed a set of graduated exercises in woodwork and metal work, not to give students the specific skills necessary for immediate employment but to train them in the uses of tools and the manipulation of materials, to round out their education, to "train the mind by training the hand" (Grubb, 1990).

Russell (1938), in the report of a committee appointed by President Roosevelt, criticized vocational education for promoting a narrow conception of vocational education with overly specific training and for encouraging a dual structure segregating vocational education from academic education.

Reports in 1963 and in 1968 also criticized the narrow approach practiced by vocational education and pointed to a need to broaden its scope (Grubb, 1978). The recent passage of the reauthorization of the Carl Perkins Act was preceded by much discussion about the need to broaden vocational education and integrate it with academic education.

Keep in mind that nothing I've said at this conference will have any practical affect on education until it is acted upon locally. Kolberg (1990) stated "This is a national problem that will be solved locally...." It's at the local level where the most exciting,
innovative developments are occurring with regard to integrating the curriculum. Local schools are experimenting, often by trial and error, to determine what makes sense and what works for them and their students in the context of their resources, personnel, and labor markets.

To make integration work locally, a school district must have a vision of what schooling should be and a commitment to seeing that vision accomplished. There is an ancient proverb which says "Where there is no vision, the people perish" (Proverbs 29:18).

That proverb has application to the business of education today. In education, we have to have a vision, we have to have a philosophy about education, what it is, what it ought to be, what it can and can’t do, who it can serve, how it can serve whom, what its end products (that is its graduates) should know and be able to do.

The vision conceptualized through integrating academic and vocational education is designed around the following observed benefits derived from integration:

- increased quality of vocational instruction through greater use of academic material and of applied academic courses;
- increased quality of academic instruction through increased use of applications and problem-oriented approaches to teaching;
- upgraded curriculum through the replacement of diluted academic (general) courses with more rigorous applied academic courses;
- improved "coherence" in the sequencing of four year programs of study as a result of vocational teachers, academic teachers, and counselors cooperatively defining such sequences;
- improved integration and increased understanding between academic and vocational teachers as a result of working together on new curricula;
decreased segregation of academic and vocational students through the development of courses and programs which eliminate the divisions between academic and vocational subjects;

increased enthusiasm of teachers for teaching and students for learning.

Do these observed benefits to an integrated curriculum fit into your vision of what education should be and do in your school district? Whatever your vision, you then develop goals and objectives, and a plan of action steps to help you get there. I'm sure your school district has a mission statement and goals for education and a plan for reaching those goals. But the question that I would ask you is simply this: When did you last revise it? In other words, how old is it? Is it still relevant in today's society? Does it produce graduates who can go on to college or immediately take their place in the world of work as knowledgeable, skillful employees or students?

Commitment to your vision is extremely important. There are a lot of barriers to making change in education. Innovation causes resistance to stiffen, defenses to set in, opposition to form. It often takes repeated attempts, endless demonstrations and persistence before your new ideas will be accepted. The point is that everyone in your district is not likely to jump on the bandwagon and think this is the greatest idea to come along.

Benson's (1989) testimony identified seven barriers to integrating academic and vocational education. These barriers that you will need to overcome include:

-- lack of well-established models of integration
-- new demands on teacher time
-- lack of resources for staff development
-- the need for consistent support of efforts at integration
-- inadequate funding and leadership in schools targeted by federal policy
-- the absence of appropriate instruments of assessment
-- an incomplete grounding in cognitive science
As educators, we need to keep in mind that integrating academic and vocational education is not an end in itself. But it does provide a vision of improving education for all students and making education real. It is an opportunity to move in the direction of responding to concerns highlighted in the Unfinished Agenda report by the National Commission on Secondary Vocational Education (1985) which states "What is really required today are programs and experiences that bridge the gap between the so-called academic and vocational courses."

There are several models of integration to choose from, and you may even develop another one, or certainly use a combination of elements from the various models as you seek to design a program that fits your situation for your students. The next section of this paper will focus on specific models of integration.

A Way to Think About Integration: Some Possible Models

Generally, researchers, policy makers, vocational teachers, academic teachers, business and industry leaders, and a host of others are supporting various efforts of integration. Interestingly, each of these groups has its own reasons for wanting to integrate programs. However, as stated earlier one can not think about integration as an end but as a means to an end: Improving some serious deficiencies in the American School System. Recently NCRVE researchers (Grubb, 1990) have attempted to define some of these efforts of integration as "models" which can be evaluated and/or modified to better fit local needs and conditions. At this time there is still a great deal of experimentation going on across the country and a paucity of hard data about integration. Grubb and Plihal use these models because, in their view, they have each changed educational practices in some manor or degree and not just renamed an existing practice.
Model 1: Incorporating academic competencies into vocational courses

a. Probably simplest form of integration
b. Relabeling of the informal reinforcement of basic academic skills in vocational classes.
c. Using develop off-the-shelf curriculum materials which identify academic competencies.
d. Academic competencies stressed are generally simple or lower level.
e. Does nothing to change the separation between academic and vocational teachers, programs and students.
f. Taught by vocational teachers.

Model 2: Combining academic and vocational teachers

a. Academic teachers initiate the teaching of academic competencies in vocational programs.
b. Assigning academic teachers to AVC part or full time to work with vocational teacher or team teaching.
c. Strength of this model is in collaboration.
d. Presence of academic teacher gives status to academic skills.
e. Most academic content is remedial.

Model 3: Making academic curriculum more vocationally relevant

a. Academic teachers incorporate vocational examples into their courses.
b. Some what like the "career ed" movement.
c. More common approach is to introduce specific new courses "applied academics".
d. Some times used to substitute for lower level academic courses.
e. Used as electives with no courses dropped from the course offerings.
f. Most popular form of integration.

g. Unless linked to vocational programs and teachers true integration may not take place.

Model 4: Modifying academic and vocational education - curriculum "alignment"

a. Changes the content of both academic and vocational courses.

b. Coordinates existing teachers and courses.

c. Relies on locally developed curricula or modified "off-the-shelf" curricula.

d. Incorporates elements from Models 2 and 3.

e. Many teachers use Applied Academic materials.

f. Teacher collaboration and student mixing.

g. Cooperative learning.

Model 5: Academy model

a. Operate as schools within schools.

b. Teacher collaboration.

c. Student groups work with teacher groups.

d. Business, industry relationships.

e. Motivate potential drop outs.

f. Does not reduce tracking of students.

Model 6: Replacing conventional departments with occupational clusters

a. Replace conventional departments.

b. Departments organized along occupational lines.

c. Career-cluster departments recommends specific course sequence.

d. Promotes teacher collaboration.

e. Reduces "turfism".

f. Expanded Academy Model.
g. Reduces tracking of students.

Model 7: Single-occupation high schools

a. Similar to academies except occupation emphasis is school-wide.
b. Academic instruction is more vocational.
c. Reduces student tracking.
d. Promotes opportunities for teacher collaboration.

Model 8: Electing career paths or occupational majors

a. Use occupational cluster as in Model 7 but still have conventional departments.
b. Students elect a "career path" to follow.
c. Integrate career-related information into academic subjects.
d. Reduces "curriculum cafeteria" approach.

These eight models are still being studied and others will probably emerge. Before school officials buy into some reform effort such as integration, there are some factors which need careful consideration and study by all stakeholders. Policy makers must determine, through some procedure, the indicators of program quality that they want to use to evaluate their strengths, successes, and areas of concern. In working with policy makers at various educational institutions, several measures of success have been identified:

a. Increased scores on standardized tests in mathematics, science, and language arts;
b. Increased selection of upper level courses on the part of vocational students;
c. Increased post-secondary enrollment;
d. Reduced unemployment of graduates;
e. Increased wage earning capacity and job quality;
f. Increased employer satisfaction; and
g. Decreased drop-out rates.

Identifying and framing these outcomes will determine what evaluation data should be collected. These outcomes will also determine which, if any, integration model should be promoted. Possible factors which will need some degree of consideration by stakeholders are:

a. Education Objectives
b. Curriculum Design
c. Textbooks
d. Teachers and Staffing Patterns
e. Staff Development
f. Student Assignment
g. Resource and Time Allocation
h. Testing
i. Organizational Structure
k. Incentives

The degree of consideration for each of these factors will be guided by state and local policy. This will require involvement of all stakeholders if we are to make progress in school improvement.

Assessing Performance-Based Learning

At the education summit in Charlottesville, the President and the Governors declared that "the time has come... to establish clear national performance goals, goals that will make us internationally competitive" (National Goals for Education, 1990).
The statement was made that

"Education is central to our quality of life. It's at the heart of our economic strength and security, our creativity in the arts and letters, our invention in the sciences, and the perpetuation of our cultural values. Today, a new standard for an educated citizenry is required... all of our people, not just a few, must be able to think for a living, adapt to changing environments, and to understand the world around them."

Goal 3 of the 6 goals established at this conference states: "By the year 2000, American students will leave grades 4, 8, and 12 having demonstrated competency in challenging subject matter including English, mathematics, science, history, and geography; and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy."

The report calls for reorienting schools so they focus on results, not on procedures. A restructuring of education that will work toward guaranteeing that all students... acquire the knowledge and skills necessary to succeed in a changing economy. What they are really saying is—we want graduates and employees who can THINK! Individuals who know the basics, but who can also solve problems, look at a set of factors and make a decision. Individuals who can transfer what they have learned from one circumstance to another. This will necessitate the teaching of less detail, but more understanding, more relationships, more cooperative efforts. As educators, we need to recognize that our students can't learn everything. There is an explosion of knowledge! Just too much for anyone to know. When you think about it, any one of us concentrates on, and uses, only a small fraction of all the knowledge available. I believe that we are doing a disservice to our young people by teaching them a lot of specific data and details that will soon be out-of-date, or even if it isn't out of date, will soon be forgotten when school is out. Technological change is occurring so rapidly that much of what we learn today will not be needed in 3 or 5 or 10 years. We ought to be teaching young people how to find the information they need and then how to use the information they have.
found. We should be teaching young people **how to learn**, and how to think through a
given set of circumstances. How to transfer what they know from one situation to
another.

Integration of academic and vocational education has peoples’ attention and is
focusing on these ideas.

In terms of assessment, the national report says "what students need to know must
be defined". There is no lack of individuals and organizations willing, at least
informally, to help define what students need to know. Everyone seems to have an
opinion.

Carnevale, Gainer, and Meltzer (1989), in a summary of research conducted under
a joint project of the American Society for Training and Development and the U.S. Dept.
of Labor titled Workplace Basics: The Skills Employers Want report that employers say
the most important skills for any employee are the three Rs- reading, writing and
arithmetic. And increasingly, employers are telling the media they will train new
employees if they have these three basics. But, they report that if you probe a little
further, you find that employers want good basic academic skills and much more.

"Employers want employees who can learn the particular skills of an
available job—who have **learned how to learn**. They want listening skills
and good oral communication skills, "employees who can think on their feet
(problem solving) and who can come up with innovative solutions (creative
thinking)."

"Employers want employees who have pride in themselves and their
potential to be successful (self-esteem); who know how to get things done
(goal setting/motivation); and who have some sense of the skills needed to
perform well in the workplace (personal and career development)."

"Employers want employees who can get along with customers,
suppliers, or coworkers (interpersonal and negotiation skills); who can
work with others to achieve a goal (teamwork); who have some sense of
where the organization is headed and what they must do to make a
contribution (organizational effectiveness); and who can assume
responsibility and motivate coworkers when necessary (leadership)."
Harms (1981) has proposed several new and dramatic changes for science programs at the elementary, middle, and high school levels which should address some of the above concerns. At the elementary level, science needs to be considered as a "basic" with assistance from local support groups to provide training, materials, and organization as needed. For example, the use of science "kits" or "tubs" is gaining in popularity among elementary teachers. This method is not new, it has been around for about 25 years. However, the science tubs used today are more "teacher friendly". But the problem of resupplying and maintaining them is still a problem. Dale Law and I are currently working on a research project to try and look at this problem (K-6 Curriculum Development, 1991). Over the last couple of years our research team has developed 10 new science tubs (grades 4-6) which also emphasize careers in agriculture:

1. Agriculture Measures Up: Using Mathematics in Agriculture
2. Agriculture Renews Our Planet: Growing Energy for the Future
3. Animals in Agriculture: Their Growth and Development
4. Dairy Delights: Good Nutrition from Milk
5. Eggciting Experiments: Chick Incubation and Embryology
6. Growing Better Everyday: Using Genetics to Improve Agriculture
7. Insects: Agriculture’s Friends or Foes
8. Probing Our Soils: Getting to the Roots of Agriculture
9. Protein Providers: The Superb Soybean
10. Rain or Shine: Weather’s Effect of Agriculture

We are providing inservice workshops to elementary teachers on how to use these new biological science tubs. We have also been talking with other groups, such as secondary agricultural education teachers, ag-in-the-classroom representatives, and regional superintendents, about maintaining the tubs for the elementary teachers. The reception so far is very encouraging and they seem anxious to get started.
Harms suggests that the science curriculum at the middle school and junior high school level shift to address issues and topics related to personal, societal and career choice needs. Decision-making and problem-solving skills would receive increased emphasis. The secondary curriculum would also shift to a science literacy context. Topics would be presented in a personal and societal context. In addition, new courses need to help students cope with an increasingly technological world stressing real-world applications.

The common theme weaving through the reform reports is the importance of applications. We need to develop strategies that connect mathematics and science problems to real-world issues - both personal and societal. The shift toward teaching the full spectrum of cognitive levels is another thread in the reform fabric. The teaching of isolated, discrete facts and principles is no longer adequate - students will need to demonstrate their understanding of the science, mathematics, and technology concepts through some means other than pencil and paper tests.

Wirt (1991) encourages the states to provide the needed leadership in developing and/or assisting local districts in designing performance-based assessment strategies. Many states are in fact using performance-based learning and assessment strategies as tools to promote school reform in general education. The strategies and action plans being formulated to promote performance-based learning and assessment in general education programs are not that different from those which are currently used by vocational, music, and art teachers.

The process is very generic when developing performance-based tests. The following steps are generally included:

a. Identify information/skills to be tested.
b. Determine if process, product, or both are to be assessed.
c. Prepare draft of assessment items.
1. process - critical steps
2. product - desirable characteristics.

d. Determine rating scale
e. Determine acceptable score for mastery.

Through various integration efforts, such as having faculty across program areas to focus on the school-wide performance-based outcomes, which have been identified at the state and/or local level, much more progress can be made than having each discipline area working in isolation. There are school districts and states around the nation which are emerging as leaders in promoting performance-based learning - but so far these tend to be isolated groups and not organized into a large scale coordinated reform efforts.

State and federal governments along with business and industry groups can be the glue to make this a cohesive and systemic reform plan. A recent report published by Allstate (1989) stated the following:

"Yet, despite the fact that everyone profits from a better school system, few communities have launched comprehensive efforts to improve education - even though the criticism and questioning of America's schools have become widespread in recent years.

What's been lacking... is a coordinated approach; a plan that provides for ongoing cooperation among education, business, and the community as a whole.

...they concluded improving education should not be left solely to educators and executives. If the system serves the community as a whole, then the community must help the system understand its needs and meet its objectives.

Hence, this report...outlines a mechanism for generating that kind of community involvement and support."

Business and industry groups are pursuing active ongoing partnerships education, business, and the whole community. They want to share ideas and resources to bring to fruitions the communities educational vision. For example, grants to the Learning Research and Development Center, University of Pittsburgh and the National Center on
Education and the Economy have been awarded over $1 million dollars each to develop and produce assessments which use, (a) performance examinations, (b) projects, and (c) portfolios. These are intended to be used as national assessments on a voluntary basis by local school districts. The funding for this effort is provided by the private sector. Their interest is to develop an assessment strategy which measures the students' ability to think and apply their knowledge to workplace problems (Workforce Development Strategies, 1991).

The Educational Testing Service (ETS) is securing funding to work with the Center for Occupational Research and Development (CORD) and the Agency for Instructional Technology (AIT) to develop performance-based assessments. Their efforts are focusing around the concepts taught in the Applied Academic Curricula. Again, the desire is to develop something more than a pencil and paper instrument. Recent research (Pepple, Law, and Valdes, 1990) indicates that these materials are accepted by many academic and vocational teachers and are being widely used in both areas for integration and performance-based learning activities, it seemed appropriate to develop performance-based assessments which can be made available to local districts.

Many local districts are currently meeting to develop their own performance-based assessments which they need for local goal assessment plans and school improvement plans. The schools are being encouraged to work with teachers across-the-board when developing their assessment strategies. Teachers are being encouraged to compare their curriculum with each others to identify where important skills and knowledge concepts are being taught and reinforced. Many times teachers are amazed at what is actually taught in other program areas and quickly see ways to align their content and share resources.
Preservice and Teacher Preparation

Pipho (1991) reported on a study conducted by the Education Commission of States (ECS) which attempted to get a measure of the progress states are making in educational reform. Two of the factors they looked at were obstacles and emerging strategies which are being proposed and debated. The obstacles identified were:

a. Lack of clear, widely accepted, and compelling vision for reform;
b. Inadequate measures of progress in student learning and system reform;
c. Doubt among people in the trenches about whether there is a deep, long-term commitment to change;
d. Lack of support for innovators and risk-takers;
e. Reform efforts that do not easily transfer from pilot sites to the entire state;
f. Lack of coordination between approaches to reform, which sends inconsistent messages to school leaders and paralyzes their will to change;
g. Lack of people who know how to lead in reform settings; and
h. A large gap between advocates of reform and parents, the public and many educators.

Pipho also listed some strategies which were being tried out or proposed in the surveyed states. These included:

a. Restructuring state departments of education;
b. Moving toward integrated curricula;
c. Using alternative forms of assessment;
d. Decentralization and site-based management;
e. "Report cards" and other forms of public accountability;
f. Earlier childhood education assistance;
g. Interagency cooperation;
h. Funding formulas designed on a more equitable basis; and
i. Interventions or sanctions for failing districts.

It is obvious that universities will also need to change how they have been doing things in teacher education programs. Preservice programs must model and demonstrate how to effectively teach in a student-centered and activity-based learning environment. If change is to occur, beginning teachers must be aware of the reform strategies such as those listed above and how to cope with one or more of the barriers which could present.

Preservice programs need to develop strategies for working across discipline areas, i.e. academic teachers working with vocational teachers, mathematics teachers working with science teachers, etc. Currently, student teaching and methods courses still have students isolated from those in other discipline areas. Collaboration and cooperation among programs are not widely practiced - they may be mentioned, but students are not shown how to do it, or lead to believe that the schools that hire them expect this type professional training.

Many other exciting efforts are emerging at the university level. Colorado State University has a federal grant to develop and disseminate teacher education and counselor education modules for pre-service training programs. These materials will be pilot tested this fall in selected sites throughout the nation. Other efforts like those at Eastern Illinois University, University of Illinois, Texas A & M University, Ohio State University, Colorado State University, and a score of other colleges and universities have begun research in the areas integration, and performance-base learning and assessment. Another research project I am currently co-directing involves coordinating one or more vocational Tech/Prep grant projects with a state board (academic) Science Literacy grant. This will allow us to use a holistic approach to school reform - K - 14+ which is coordinated and supported by state and local stakeholders.

One more obstacle to performance-based education seems to be university admissions wanting to see course records and standardized test scores with student applications for admission. Again committees are working on this and some colleges are
considering portfolios or other forms of records in place of course transcripts. Again, not everyone is up-to-speed on this reform effort. Communication and buy-in among all stakeholders takes time and compromise in the drafting of policies and strategies is a given.

Another factor is that most college teaching is very traditional in its delivery. This is changing in many colleges, especially among the professional schools who are responding to the changing business and industry climate. These curricular changes toward emphasizing "employability skills" are the same as those vocational and technical education programs are incorporating into their courses. Once key stakeholders agree that these outcomes are the same for all students, educational reform should, for the first time be coordinated and supported across school discipline areas, educational levels, state and local governments, and business and industry professionals.
References


INTEGRATED CURRICULUM AND PERFORMANCE-BASED EDUCATION — A STRATEGY FOR SYSTEMIC CHANGE

April 18, 1991

Dr. Jerry D. Pepple
University of Illinois
Department of Curriculum and Instruction
Champaign, Illinois

1991 Workshop on Integrating Academic and Vocational Education

Austin, Texas

(This presentation is based on an original paper presented by Drs. Dale A. Law and Jerry D. Pepple and presented at a conference on Integration at Greeley, Colorado, November 1990.)
Eight Models of Integration

Model 1: Incorporating academic competencies into vocational courses

Model 2: Combining academic and vocational teachers

Model 3: Making academic curriculum more vocationally relevant

Model 4: modifying academic and vocational education — curriculum "alignment"

Model 5: Academy model

Model 6: Replacing conventional departments with occupational clusters

Model 7: Single-occupation high schools

Model 8: Electing career paths or occupational majors
Levels of Instruction for Applied Academics

*Based on Bloom’s Taxonomy*

“All employees will need to apply logical thinking to define problems, collect data, establish facts, and draw valid conclusions.”

Judy Whipple, Briggs and Straton
Workplace Basics
The 7 Skills Groups

• Organizational Effectiveness/Leadership

• Interpersonal Negotiation/Teamwork

• Self-Esteem/Goal Setting-Motivation/Personal & Career Development

• Creative Thinking/Problem Solving

• Communication: Listening & Oral Communication

• 3 R's (Reading, Writing, Computation)

• Learning to Learn
# One Approach to Integration

<table>
<thead>
<tr>
<th>Pure Applied</th>
<th>Applied Academics</th>
<th>Pure Academics</th>
</tr>
</thead>
</table>
| - can't generalize  
- too fragmented  
- lower-level learning  
- based on job tasks  
- no theory  
- turns off many students | - student centered  
- empowers the learner  
- not remedial  
- promotes cooperative learning/teaching  
- uses holistic approach to education  
- targets the middle 50% of student population | - abstract  
- turns off many students  
- no applications  
- repetitive drill  
- authoritarian model |
Changing Policies and Administration to Integrate Academic and Vocational Education

Existing policy and administrative structures may be barriers to integrating academic and vocational education; removing barriers and creating new policies and administrative procedures may be necessary to integrate academic and vocational education.

_NCRVE Summer Conference on Integration_  
_August, 1990_  
_Berkeley, CA_
Critical Questions

What is the purpose of schooling in your district?

How does integration fit into this purpose?

How are you measuring your outcomes?

How can integration enhance these results?

Process

- collaboration
- staff development
- administrative
- commitment
- teaching practices

Product

NCRVE Summer Conference on Integration
August, 1990
Berkeley, CA
Integration — Positives

- Better product/employable student
- Improved learning
- Program survival and recognition
- Cooperation/collaboration between vocational and academic education
- Staff desire and motivation

Pickens Tech
Aurora Public Schools
Aurora, Colorado
Integration — Negatives

- Lack of time and resources
- Staff variables (expertise, attitudes, etc.)
- Student variables (boredom, time, etc.)
- Communication/coordination problems

Pickens Tech
Aurora Public Schools
Aurora, Colorado
Developing Performance-Based Assessments

• Identify information/skills to be tested

• Determine if process, product, or both are to be assessed

• Prepare draft of assessment items
  Process — critical steps
  Product — desirable characteristics

• Determine rating/grading scale

• Determine acceptable score for mastery
Strategies for Reform

- Restructuring state departments of education
- Moving toward integrated curricula
- Moving away from course requirements and requirements for specific amounts of seat time
- Using alternative forms of assessment (portfolios and performance assessments)
- Decentralization and site-based management (including the push for building professionals to share decision making with parents and community members)
- "Report cards" on the schools and other forms of public accountability
- Early childhood education assistance (both preschools and parent training)
- Interagency cooperation (e.g., cooperation with physical and mental health agencies)
- Funding formulas designed on a more equitable basis
- Interventions or sanctions for failing districts
Obstacles to Reform

• Lack of a clear, widely accepted, and compelling vision for reform

• Inadequate measures of progress in student learning and system reform

• Doubt among people in the trenches about whether there is a deep, long-term commitment to change

• Lack of support for innovators and risk-takers

• Reform efforts that do not easily transfer from pilot sites to the entire state

• Lack of coordination between approaches to reform, which sends inconsistent messages to school leaders and paralyzes their will to change

• Lack of people who know how to lead in reform settings

• A large gap between advocates of reform and parents, the public, and many educators
A Time for Leaders and Managers

- Must create an environment for diverse groups to come together and address problems
- Rewards and assessments must reflect new goals
- What is measured is what gets done
- Must take time to create infrastructure and environment to support systemic change
- Must begin to think through total process
- Use holistic approach
- Identify and remove barriers

1991 IMSA Leadership Conference
Accountability System — Four Measures of Quality

- Measures and standards must be clearly defined

- The numbers and measures and standards should be manageable

- The data for measuring performance indicators must be reasonably accurate, timely, and easy to measure

- Measures and standards information must be provided regularly enough to make it useful

Gareth Hoachlander
Vocational Education Journal
Feb., 1991
Elements for Integration

- Vision and commitment
- Consistent support
- New resources
- Autonomy for teachers
- Teacher training and retraining
- Sustained efforts

"There is no substitute for teachers and administrators sitting down and defining for themselves what problems they want to address, what they most want to accomplish and what resources they have to meet their goals."

W. Norton Grubb
Vocational Education Journal
Feb., 1991
“The Perkins Act is an important step in redirecting vocational education and, ultimately, in restructuring our high schools for the 21st century.”

Larry Rosenstock
PDK
Feb., 1991
"The performance measures are to include gains in the mastery of basic and more advanced academic skills, gains in competency in one or more occupational areas, plus retention in school or graduation and subsequent employment."

John Wirt
PDK
Feb., 1991
“This theme of ‘integrating’ academic and vocational education establishes a new direction in federal policy that is likely to grow in importance over time. The basic concept is that academic education and vocational education (or preparation for work) should grow out of and complement each other.”

John Wirt
PDK
Feb., 1991
“Presentation and repetition help students do well on standardized tests and lower order skills, but they are generally ineffective as teaching strategies for long term learning, for higher-order thinking, and for versatile problem-solving.”

Everybody Counts, 57
"We have drifted into a curriculum by default, a curriculum of minimum expectations that resists the changes needed to keep pace with the demands of preparing students for contemporary life."

John A. Dossey
Professor of Mathematics
Illinois State University
"We no longer need hundreds of people to do things by hand. We need people who can read digital read-outs, take statistics and numbers off machines, and write them in charts for further analysis."

Susan Hooker
Motorola
“Pursuing integration with academic education requires us to adopt a different view: That vocational education is a different way to learn the same academic concepts and skills that nonvocational students learn.”

“A true integration requires nothing less than a full restructuring of high schools.”

“With the new Perkins Act, the federal government has forged a powerful tool for re-creating schools.”
"The primary goal of integrating academic and vocational education is to make the experience of applied vocational education more accessible to academic students at the same time that advanced academic courses are made more accessible to students concentrating in vocational education."

"The integration of academic and vocational education is a movement to reform not just vocational education but the entire secondary education curriculum."

Kenneth Gray
PDK
Feb., 1991
"We’re already spending $117 million a year on training at Chrysler. But it doesn’t all go to train workers how to run computers or robots or stamping presses. A big part of it goes to teach our people the three R’s they didn’t learn in school. In some of our plants, we have about 25 percent of our people reading at grade six or below, many of them functionally illiterate."

Lee Iacocca
1989 National Education Association meeting
Toward the Integration of Vocational and Academic Education: A Group Process

Facilitated by

Jerry D. Pepple
University of Illinois

General Session
NGT has six steps:

1. Presentation of the task to be accomplished.

2. Silent generation of ideas for ten minutes. Each participant is charged to silently write down the short phrases of statements which answer the question. The intent is to get as many answers as possible from all group members.

3. Round-robin recording of ideas. The participants are asked to read their ideas, one idea per person at a time. Each will be recorded, and numbered, on the master list. No discussion takes place. One-by-one, each participant either gives an idea or passes until all of the ideas generated by the group have been recorded. No editing of material and no evaluative comments are desired at this time. All participants are encouraged to "hitch-hike" on the ideas of others and add new ideas to the list. The point is to allow all members equal opportunity to contribute to the group.

4. Ideas clarified and discussed. This step is designed to promote a clear understanding of each idea. Over-lapping or similar ideas may be merged.

5. Valuation of relative importance of ideas. Each participant ranks the top five items out of all of those recorded. Five points are given to the relatively most important idea; four points given to the second most important idea; three points go to the third most important; two points go to the fourth most important; one point is given to the fifth most important. The votes, on note cards, are counted and tallied for each item.

6. The process yields a list of answers, in order of ranking.

This final vote summarizes the NGT process: it provides a measure of the relative group consensus as to the value of the many ideas generated, it provides a sense of closure and accomplishment, and it documents the group judgement.

Barriers to Integrating Academic and Vocational Education

1. turf, territorial issues
2. time restrictions
3. coordination/cooperation
4. graduation requirements/advanced diplomas; Carnegie units; no room in four year plan; graduation credits; new report card
5. Image of vocational education; labeling; vocational stigma; stereotypes; parent/community perception; prejudice
6. Ignorance between groups; lack of understanding and communication
7. inservice time, time for teacher training
8. School board agreement
9. Priorities
10. Makes electives "not fun"
11. Community/parental involvement - understanding - ignorance - lack of understanding
12. Attitudes: counselors, apathy, business, parents, students, community
13. Traditional separation of all courses; separate inservice schedule; program stratification; division of students academic/vocational
14. Need to focus on future
15. No consensus of definition - vary among levels
16. Organizational funding structures; difference in funding, goals
17. National trends don't favor Vocational education
18. No credit for applied courses - dual credit
19. Community pre-conceptions
20. No requirements except for Vocational education
21. TEA regulations (funding); federal legislation
22. Logistics; locations, physical separation; facility differences; isolation; existing school structure; building proximity
23. Site-based management
24. In rural area, breaking with tradition
25. Selling the "concept"
26. No guidelines, mandates, funding
27. Concept of college for everyone
28. Limited curriculum materials (integrated materials, applied materials)
29. Resistance to change; easier to stay same; apathy; teacher mind set; mistrust
30. Shortage of resources
31. Time and money for planning and developing programs
32. Overcrowded curriculum in academics
33. Vocational responsibility
34. Vocational educators think that they already do it
35. Lack of leadership, facilitators (national, state, and especially local); lack of initiative
36. Where does it begin - who starts it, and where?; lack of clear vision
37. Lack of knowledge of our work force by academic teachers
38. Job security
39. Lowering of standards by academic teachers
40. Political issues/gaining consensus
41. Curriculum specialist in academic/lack of knowledge in vocational area
42. Raw materials
43. Finger point...
44. Different goals - elitism
45. Counselors; inadequate counseling; schedule/choices, can't do both, registration bias; registration bias to academic
46. Resource and facility management
47. Teacher background
48. Staffing logistics and curriculum (cross-training)
49. Conference time between academic and vocational
50. Lack of knowledge of curriculum
51. Lack of models/integrated curriculum; lack of curriculum coordination
52. Lack of support from the top/leadership, administration, board, parents, teachers, counselors, community
53. Size of class loads
54. Wide range of entry-level academic abilities
55. Doesn't always fit essential elements
56. Out of date terminology - stigma about vocational education (students and teachers)
57. Limited knowledge of academic teachers; lack of teacher know-how; knowing changes to make
58. Lack of good staff development; lack of staff development time
59. Scheduling problems (especially small schools)
60. Teacher philosophy about what an educated person is
61. Teacher preparation at college level
62. Assessment, non-competitive testing to performance; mandated testing; teaching TAAS tests
63. Whole system is barrier (regulations, law restrict sharing)
64. Teacher preparation pre- and post-; certification; teacher preparation at college level
65. Concentrating resources on top students
66. Vocational teachers not good role model
67. Instructional arrangements
68. Mandates biased to academic
69. Vocational educators feel unqualified
70. Academic education feels vocational is unimportant
71. Vocational resents spending their time on academics

<table>
<thead>
<tr>
<th>Barriers Listed as Top Five</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Community/parental involvement - support - understanding - ignorance - lack of understanding</td>
</tr>
<tr>
<td>2. Turf, territorial rights</td>
</tr>
<tr>
<td>3. Coordination/cooperation</td>
</tr>
<tr>
<td>4. Graduation requirements/advanced diploma</td>
</tr>
<tr>
<td>5. School board agreement</td>
</tr>
<tr>
<td>6. Attitudes: counselors, business, parents, students, community</td>
</tr>
<tr>
<td>7. Stereotypes, stigma, image, perception, apathy, tradition</td>
</tr>
<tr>
<td>8. Lack of organizational leadership/support - (national, state, and especially local); undefined responsibility</td>
</tr>
<tr>
<td>9. Community pre-conceptions</td>
</tr>
<tr>
<td>10. Organizational funding structure; TEA regulations - funding</td>
</tr>
<tr>
<td>11. Distrust between teachers and lack of communication</td>
</tr>
<tr>
<td>12. Concept of college for everyone</td>
</tr>
<tr>
<td>13. Selling the &quot;concept&quot; - vocational education</td>
</tr>
<tr>
<td>14. Tracking issues</td>
</tr>
</tbody>
</table>

52
<table>
<thead>
<tr>
<th>Barrier Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. Resistance to change; no change</td>
</tr>
<tr>
<td>16. Lack of time/money for planning and developing; time for teacher training</td>
</tr>
<tr>
<td>17. Lack of school/community support; teacher support</td>
</tr>
<tr>
<td>18. Lack of articulation</td>
</tr>
<tr>
<td>19. Isolation; traditional separation</td>
</tr>
<tr>
<td>20. Planning time for academic and vocational teachers</td>
</tr>
<tr>
<td>21. Testing; assessment</td>
</tr>
<tr>
<td>22. System - regulations, laws</td>
</tr>
<tr>
<td>23. Teacher philosophies</td>
</tr>
<tr>
<td>24. Teacher preservice training, preparation</td>
</tr>
<tr>
<td>25. Lack of models integrated curriculum</td>
</tr>
<tr>
<td>26. Resources - time, space, funds, facilities</td>
</tr>
</tbody>
</table>

---

**Barriers Listed by Entire Group**

1. Attitudes, vocational and academic - administration
2. Lack of organizational leadership, all levels
3. Community Preconceptions
4. Funding structure
5. Planning and development time
6. Lack of models
7. Time for teacher training
8. Resistance to change
9. Graduation credits
10. Advanced diploma
11. Fear issues - turf
12. Apathy
13. Curriculum
14. Counseling - inadequate
15. Articulation
16. No transfer of knowledge by students
17. Lack of definition of integration
Solutions to Barriers to Integrating Academic and Vocational Education

1. Train teachers better/differently; reform teacher preparation program; develop university support (training, technical support)
2. Target all students for vocational education
3. Do a LOT of PR for vocational education
4. Team teach/planning by teachers, students, administrators, counselors, community
5. Cross hire positions into vocational education department
6. Mentoring span academic and vocational
7. Provide conscience-raising sessions for all
8. Time (school periods, day, year); longer day - year - with increased salaries
9. Administrative commitment for change
10. Community needs assessment
11. Eliminate/rethink advanced diploma
12. Local level planning and restructuring
13. Flexibility in TEA regulations; state approval of applied academics courses
14. Provide training for all involved; cooperative effort - NGT set-up; explain education achievement for life-long learning
15. Field trips or industry tours for academia; monthly trips for all counselors
16. Community, industry, business involvement and support
17. Re-education of administration; ask for administrative support
18. Move to competency-based education; performance-based assessment
19. Commitment across all levels
20. Reverse statutes that are barriers; educate legislature
21. Start out with volunteer teams; exemplary pilot programs; have teams visit these programs
22. Incentive program
23. Public relations/advertising/mass media - sell everyone
24. Develop integration plan
25. Ownership from all levels, teachers, counselors
26. Vocational education is not the same as it was "yesterday"
27. Curriculum integration; develop curriculum materials that integrate; joint development by academic and vocational; competencies in all courses; eliminate curriculum overlap; coordinated curriculum documents from TEA
28. Set goals/district philosophy; create district vision for integration
29. Release time
30. Flexibility in graduation requirements - textbook proclamations
31. Activities - school-wide
32. Rearrange master schedule
33. Involve younger students in technical education
34. Change philosophies "we vs. them" to "us"
35. School personnel in-service (training); staff development (district-wide); bring in inspired people
36. Extended contract for teachers for articulation
37. Required attendance at vocational workshops for academic teachers
38. Vocational teachers learn about each other
39. Academic teachers see what they teach applies
40. Mandate overall participation of integration; provide funds to do so
41. Rethink agency organization (TEA)
42. Teachers return/go to industry in the summer; shadow business experience in the community
43. Do away with the career ladder (no one shares ideas)
44. Clear definition coordinated with essential elements
45. Do away with the essential elements - let the teachers decide what to teach
46. Use shared problem-solving techniques among teacher practitioners
47. Increased vocational counseling; promote job (career) awareness
48. Pro-active role by TEA leadership
49. Site-based management
50. Give academic credit for vocational courses where appropriate
51. Make it a part of accreditation
52. Re-examine the whole issue of the Carnegie unit
53. Communication and coordination; provide training
54. Utilize team teaching or planning; cross-departmental teacher teams; pair teachers (Voc. & Acad.) communication, instruction, student activities, resources
55. De-emphasize isolated courses and instruct from holistic approach
56. Revise federal legislation to promote comprehensive planning
57. Develop rules that promote multidisciplinary instruction
58. QWIP, PIC
59. Designate the leadership
60. Academic teachers see how what they teach applies
61. More information provided
62. More cooperative training with industry
63. Public forum - parents, industry, community, school
64. New leadership and guidance and teachers with right philosophy (integration)

Solutions listed as Top Five

1. Public relations; professional mass media
2. Ownership from all levels, teachers, counselors (ALL LEVELS); commitment from all levels
3. Curriculum integration; coordinate curriculum documents through TEA
4. Set goals/district philosophy
5. Funding/release time
6. Use shared problem-solving techniques among teacher practitioners
7. District-wide staff development on this subject; inservice/staff development to explain educational achievement for lifelong learning; more information provided for teachers, parents, administration, etc.; training for all involved; cooperative effort (NGT set-up)
8. Model programs; visit model program at a pilot site (how-to)
9. Do away with the essential elements - let the teachers decide what to teach
10. Focus resources to meet this objective
11. Communication, coordination, and cooperation
12. Mandate overall participation
13. De-emphasize isolated courses and instruct from holistic approach
14. Increase vocational counseling
15. Develop integration plan
16. Cross-department teacher teams; pair teachers to work together and develop curriculum; teaming (training, planning, cross-hiring, teaching, staffing)
17. Greater flexibility from state agency
18. Academic teachers see how what they teach applies
19. Designate the leadership
20. Definitions
21. Revise graduation requirements/statutes/rules/textbook proclamations/TEA organization
22. Revise federal legislation to promote comprehensive planning
23. Revise teacher preparation; train teachers better; increased funding for teacher training
24. Set goals/philosophy/district-wide
25. Funding/release time
26. Change philosophy - "we vs. them" to "us"
27. Public forum and cooperation - school, community, business
28. Attitudes - compassionate training
29. Modeling/assessment
30. State leadership
31. Restructure the bureaucracy (federal, state, local)
32. Local planning/restructure; create district vision
33. Longer day, year, salaries
34. Community needs assessment
35. Community/business involvement
36. Flexibility in TEA requirements, state approval of all applied academic courses

Solutions Listed in Main Group

1. Change in philosophy "we vs them" to "us"
2. Coordinated curriculum documents through TEA
3. More inservice and staff development (PAID)
4. More information (quality) provided
5. Public forum and cooperation among schools, community, and business
6. Assertive leadership (compassionate, new)
7. Training - life-long learning
8. Communication, coordination, and cooperation
9. Mandate overall participation
10. De-emphasize isolated courses - holistic approach
11. Increase in vocational counseling
12. Local planning - community involved
13. Comprehensive planning
14. Funds with mandates
15. Longer day, longer year, more money
16. No career ladder
17. Re-evaluate district philosophy
18. Public relations activities
19. Greater flexibility from state agency and board
20. Academic teachers discover how what they teach applies
An Overview of Integrating Vocational and Academic Education

Michelle Sarkees-Wircenski
University of North Texas

General Session
NEED FOR STRONG BASIC SKILLS

* A Nation At Risk, released in 1983 by the National Commission on Excellence in Education, stressed a need for renewed emphasis on basic skills instruction and increased academic performance.

* The increasing public concern regarding the academic outcomes of high school graduates and the growing demand for accountability from the public school curricula.
* The increase in the academic courses necessary for graduation in many states in the nation's search for excellence and the resulting changes in curriculum.

* Requests from business and industry that graduates be prepared with a foundation of basic academic skills that can be related to entry level jobs.

* Advances in technology which have increased the necessary levels of math, reading, communication skills, and critical thinking skills for emerging occupations.

(Pritz and Crowe, 1987)
In the widely quoted publication entitled, Workforce 2000, it is stated:

If this bright future is to be realized, the educational standards that have been established in the nation's schools must be raised dramatically. There is no excuse for vocational programs that "warehouse" students who perform poorly in academic subjects or for diplomas that register nothing more than years of school attendance. From an economic standpoint, higher standards in the schools are the equivalent of competitiveness, internationally.

(Johnson and Packer, 1987)
FIGURE 2
THE 7 SKILL GROUPS

Organizational Effectiveness/Leadership
Interpersonal/Negotiation/Teamwork
Self-Esteem/Goal Setting-Motivation/Personal & Career Development
Creative Thinking/Problem Solving
Communication: Listening & Oral Communication
3 R's (Reading, Writing, Computation)
Learning to Learn
# Basic Competencies

## Entry Level Prerequisite Skills

- Use our words appropriately in writing and speaking.
- Use appropriate contractions & shortened forms of words with an apostrophe in writing.
- Use appropriate abbreviations of words.
- Use words appropriately which mean the same as other words but are spelled differently.
- Use words appropriately which are opposite of one another.
- Add appropriate word choices in writing and speaking.
- Add appropriate beginnings (prefixes) and endings (suffixes).
- Use accurate spelling of words.
- Use correct agreement of nouns, verbs, pronouns, adjectives, and adverbs.
- Use correct person, gender, number, case, and tense.

## Reinforced and Integrated during Vocational Training

## Problem Solving Applications

**Minimal Competency** - 85% or as designated in the Competency Achievement Plan

<table>
<thead>
<tr>
<th>BASIC COMMUNICATION SKILLS</th>
<th>ALLIED HEALTH CAREERS</th>
<th>AUTO MECHANICS</th>
<th>BUSINESS/OFFICE</th>
<th>CARPENTRY</th>
<th>DATA PROCESSING</th>
<th>D.E./MARKETING</th>
<th>DIESEL MECHANICS</th>
<th>HOME ECONOMICS</th>
<th>INDUSTRIAL TECH.</th>
<th>PRACTICAL NURSING</th>
<th>VOCATIONAL AGRICULTURE</th>
<th>WELDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use plural words appropriately in writing and speaking.</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
</tr>
<tr>
<td>2. Use appropriate contractions &amp; shortened forms of words with an apostrophe in writing.</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
</tr>
<tr>
<td>3. Use appropriate abbreviations of words.</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
</tr>
<tr>
<td>4. Use words appropriately which mean the same as other words but are spelled differently.</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
</tr>
<tr>
<td>5. Use words appropriately which are opposite of one another.</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
</tr>
<tr>
<td>6. Add appropriate word choices in writing and speaking.</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
</tr>
<tr>
<td>7. Add appropriate beginnings (prefixes) and endings (suffixes).</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
</tr>
<tr>
<td>8. Use accurate spelling of words.</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
</tr>
<tr>
<td>9. Use correct agreement of nouns, verbs, pronouns, adjectives, and adverbs.</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
</tr>
<tr>
<td>10. Use correct person, gender, number, case, and tense.</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
<td>ABC</td>
</tr>
</tbody>
</table>
### SAMPLE CROSS-CORRELATIONAL MATRIX DISPLAY

#### ELECTRONICS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic Whole Number Skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computers and Calculators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordinate Geometry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decimals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Directed Number (+, -)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exponents, Powers, Roots</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formulas and Equations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fractions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geometric Plane Figures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graphs and Tables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logarithms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matrices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement, Linear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement, Electrical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parallels and Perpendiculars</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polynomials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Products and Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ratio and Proportion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rational &amp; Irrational Numbers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solving Inequalities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Triangles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigonometry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vector Applications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metric Prefix</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base Number Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boolean Algebra</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**COMMITTEE:**

Bill Ford, Burlington High School  
Bill Richards, Essex Junction Area Vocational Center  
Richard Robinson, Rutland Area Vocational Center  
Luther Tabor, Trade and Industry Consultant

We recommend that Electronics full program completers be granted Math equivalency.

**MAY 20, 1985**
## MATRIX: MATH APPLICATIONS BY CONTENT UNITS

<table>
<thead>
<tr>
<th>MATH TOPICS</th>
<th>CONTENT UNITS IN WHICH MATH TOPICS ARE COVERED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MECHANICS</td>
</tr>
<tr>
<td>A. BASIC ARITHMETIC SKILLS</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>1. WHOLE NUMBERS</strong></td>
</tr>
<tr>
<td></td>
<td>Timing (also degrees)</td>
</tr>
<tr>
<td></td>
<td>Grade - rages</td>
</tr>
<tr>
<td></td>
<td>Engine rebuilding</td>
</tr>
<tr>
<td></td>
<td>Cylinder displacement</td>
</tr>
<tr>
<td></td>
<td>Place valve</td>
</tr>
<tr>
<td></td>
<td>Micrometer readings</td>
</tr>
<tr>
<td></td>
<td>Brakes</td>
</tr>
<tr>
<td></td>
<td>Displacements</td>
</tr>
<tr>
<td></td>
<td>Tolerances</td>
</tr>
<tr>
<td></td>
<td>Micrometer readings</td>
</tr>
<tr>
<td></td>
<td>Brakes</td>
</tr>
<tr>
<td></td>
<td>Displacements</td>
</tr>
<tr>
<td></td>
<td>Tolerances</td>
</tr>
<tr>
<td></td>
<td>Ratio</td>
</tr>
<tr>
<td></td>
<td>Coolant system</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Applications in this area are found in all levels of the four-year sequence of electronics.
Texas Education Agency Symposium

Moderator: Jerry D. Pepple  
Univeristy of Illinois

Speakers: Grace Grimes  
Assistant Commissioner,  
Curriculum and Instruction  

Robert S. Patterson  
Director,  
Vocational Education

General Session
Texas Education Agency Symposium

Grace Grimes
Texas Education Agency

Robert S. Patterson
Texas Education Agency

Comments by Grace Grimes:

Teachers need to address education for all students and make connections between general and vocational education for all students:

1. Reinforcement of academic skills in vocational courses.
2. Reinforcement of academic skills by academic teachers.
3. Academic teachers need applications in courses for every concept taught.*

*Why don't we have these applications? We don't know. We came up in this same educational system.

We need massive restructuring of preservice and inservice for teachers. I strongly recommend it.

Comments by Robert S. Patterson

1. We need to change attitudes, the way we look at things. Tracking vocational students builds barriers; students are branded.

2. The Carl Perkins Act and money is a vehicle, not a reason to integrate general and vocational education. The reason is to better serve or develop total students.

Education is presented in "packages", each course being a package. At the end of high school, a student has a basket of packages. We need to teach our part of the puzzle, but show how it fits together.

Educators are encouraged to go home and look for common topics and build bridges.

A ring was used as an example of integration. By looking at a ring one can consider history (Why do people wear rings? What is the history of rings?), geography (Where do the materials used to make a ring originate?), science (What elements make up the ring? How are these elements processed?), manufacturing (How is the ring made?), marketing (What is the process of selling the ring?), and art (Consider the design of the ring.).

It is not a sin for a student to do one project for grades in several courses; this will help enable students to see the bridge between subjects.
Setting the Stage for Integration at the Local District Level

Mary W. Hendrix
Educational Development & Training Center
East Texas State University

Topic C1
Setting the Stage for Integration

at the Local District Level

Mary W. Hendrix, Director

Educational Development and Training Center

East Texas State University

Texas A & M University

Integration of Vocational and General Education Conference

Austin, Texas

April 19, 1991
The Five Most Common Integration Fallacies

Integration is:

1. vocational education instructional materials that emphasize academic principles.

2. vocational teachers emphasizing academic principles in their instructional deliveries.

3. an event and can be accomplished during a one-day workshop.

4. academic teachers grading the academic skills emphasized in vocational education classes.

5. for the educationally disadvantaged.
Five Points to Remember About Integration

1. The term integrate means to form, coordinate, or blend into a functioning or unified whole.

2. Integration is a process not an event—not one specific strategy will suffice—it is a continuous operation.

3. Both vocational and academic teachers must collaborate, as well as communicate, for integration to occur.

4. Integration is for all students! It establishes motivation and relevancy for learning.

5. Integration cannot occur simply by providing correlated instructional materials.
Plan for Integration at the Local District Level

I. Provide key administrators with the background information necessary to secure their support and commitment.

II. Form a committee comprised of: academic and vocational teachers who are considered leaders; administrators, counselors, parents, business and industry representatives, community leaders, and school board members.

III. Develop a three-year integration plan with goals, objectives, specific strategies, and performance measures.

IV. Conduct an eight-hour overview training session for all staff—vocational teachers, academic teachers, counselors, and administrators.

A. Begin the training by citing the benefits of integration.
   
   Examples:
   1. Students are motivated to learn—they see the relevancy of learning.
   2. Students' scores on the Texas Assessment of Academic Skills' scores will rise!
   3. Students become equipped with workplace basic skills.
   4. The public obtains a more positive view of public schools.

B. Describe your local district's integration plan.
   
   1. Allow participants to voice their concerns and any problems they foresee in implementing the integration plan.
   2. Respond to their concerns.

C. Provide opportunities for vocational and academic teachers to communicate and collaborate.
   
   1. If possible, pair a vocational teacher with an academic teacher (rotate the academic teacher) to determine correlations for application.
   2. Provide a conduit for teachers to communicate.
      Examples: TAAS objectives, essential elements from both courses to determine correlations.
   3. Assign teachers a written task to complete.

D. Secure feedback from participants—have each participant state something he/she learned from the experience.

V. Conduct weekly faculty meetings to discuss progress toward meeting the goals and objectives of the district integration plan.

VI. Provide all faculty with an annual report describing the integration activities, goals and objectives achieved, and concerns raised.

VII. Revise integration plan as needed.
Integrating Technology Education and General Education

Cam O'Keefe
EIMC
University of Texas at Austin

Clif Wendel
Technology Teacher
Grisham Middle School

Karen Kamenzind
Social Studies Teacher
Grisham Middle School

Susam Schwausch
Language Arts Teacher
Grisham Middle School

Educational Development & Training Center
East Texas State University

Topic C2
DEVELOP INSTRUCTIONAL MODULES INTEGRATING APPROPRIATE GENERAL EDUCATION AND INDUSTRIAL TECHNOLOGY EDUCATION ESSENTIAL ELEMENTS
TEA Curriculum Development Grant #C-02

OBJECTIVES:
The general objective of this project is to identify general education essential elements which are currently taught and/or reinforced in identified Industrial Technology Education courses and develop instructional modules that will enhance the teaching and application of the selected essential elements.

Specific objectives include the following:

1. To identify the language arts, mathematics, science and social studies essential elements that are currently taught and/or reinforced in selected Industrial Technology Education courses.

   Selected Courses as Identified in TEA Grant #C-02:
   - Introductory Industrial Technology I
   - Introductory Industrial Technology II
   - Technology Systems
   - Production Systems

2. To develop instructional modules which will enhance the instruction of these identified essential elements in general and Industrial Technology Education.

3. To develop recommended teacher in-service strategies and guidelines for implementation of the instructional modules at the district level.

4. To pilot the instructional modules in no less that four school districts.

Districts Identified:
- Abilene Independent School District
- Richardson Independent School District
- Round Rock Independent School District
- Ysleta Independent School District

FOR ADDITIONAL INFORMATION CONTACT:
Cam O'Keefe or Alan L. Towler
Extension Instruction and Materials Center
The University of Texas at Austin
P. O. Box 7218
Austin, Texas 78713-7218
512/471-7718 1/800/252-3461
FAX 512/471-9677
Considerations for Developing an Interdisciplinary Unit

1. Determine community resources and interests.
2. Investigate the needs of the school and students.
3. Set reasonable expectations.
4. Stimulate interest in administrators, faculty, and students.
5. Be interdisciplinary, involving all possible areas.
7. Build in various levels of potential for success.
8. Design multiple components.
9. Research continued use of results.
10. Consider duplication and growth of modules.
11. Incorporate school and community recognition.
12. Investigate the possibility of contributions and support from local industry.
13. Become familiar with current events (community &/or world needs).
Teacher Concerns To Be Addressed

Will administrators be supportive and cooperative?

Will we have time to plan with team teachers?

Will there be adequate and appropriate staff development?

Will we have time for implementation and still teach our existing EE's?

Will all teachers cooperate with the plan?

Will teachers feel territorial and not want to lose their own "discipline identity"?

Will modules be truly useful for students?

Will the class work be redundant for the students?

Will students not taking technology be left out of learning?
Areas Covered in Technology

Tech I & Tech Systems

Communications
  - Design & Sketching
  - Reproduction Processes
  - Communication Systems
  - Computer Related Communications
  - Space-based Systems

Energy
  - Apparatus
  - Models
  - Maps & Charts
  - Computers
  - Robots
  - Transportation Systems
  - Space-based Systems

Production
  - Organization & Management
  - Processes
  - Construction
  - Automation
  - Computer Numerical Controls
  - Materials
  - Recycling
  - Space-based Systems

Tech II & Production Systems

Manufacturing
  - Materials
  - Recycling
  - Organization & Management
  - Financial Resources
  - Mass Production
  - Charts & Graphs
  - Computers
  - Automation
  - Space-based Systems

Construction
  - Site Selection
  - Design & Construction
  - Electrical
  - Plumbing
  - Finishing
  - Subcontracting
  - Landscaping
  - Energy Conservation
  - Automation
  - Recycling
  - Space-based Systems
Personal and Industrial Safety
Technology

Technology Activity Summary:
Through lecture, discussion and demonstrations the students will become aware of the need for developing a safe attitude and safe work environment. They will become familiar with the machines and equipment in their lab areas. Students will develop an awareness that safety is universal.

Technology Overlap

Language Arts Activity:
Students will observe safe operation of machines in IT, note steps involved in the safe operation, and return to the classroom to compose the steps showing proper sequence of safe operation for specific machines.

Math Activity:
Students will observe calibration / adjustments on each piece of equipment in the lab. The importance of accurate measurement will be discussed.

Science Activity:
Chemical and open flame safety - Students will observe safe use and handling of chemicals and open flames in a laboratory setting.

Social Studies Activity:
Students will compare safety procedures between today and the time of the Industrial Revolution.

Overlapping Timeline:
Social Studies only begins Days 1 & 2

<table>
<thead>
<tr>
<th>Day</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>1-SS</td>
<td>2</td>
<td>3-LA</td>
<td>4-M</td>
<td>7+</td>
</tr>
<tr>
<td>Language Arts</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science</td>
<td>1-T</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Studies</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Technology EE's: 70.50.4 Safety
Video Photography
Technology

Technology Activity Summary:
Given the appropriate instruction, forms and equipment, students will write, direct, perform in, edit and produce a quality video which is a minimum of 3 minutes in length. Students will then film a representation of prominent historical Texans presented by the language arts department.

<table>
<thead>
<tr>
<th>Technology Overlap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language Arts Activity</td>
</tr>
<tr>
<td>Students will write and act out an original script for vignettes describing five events in Texas history.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Math Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students will evaluate the impact of TV commercials and the student made educational video.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Science Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students will explore the use of video photography in scientific research, medicine, and modern technology.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social Studies Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students will identify events and individuals in history, report to the language arts classes, and view a video of their topics.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overlapping Time Schedule:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
</tr>
<tr>
<td>Language Arts</td>
</tr>
<tr>
<td>Math</td>
</tr>
<tr>
<td>Social Studies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Language Arts only - Day 6 - 13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology may get involved with props, depending on the time frame and the classes.</td>
</tr>
</tbody>
</table>

| Day | 14 | 15 | 16 | 17 | 18 |
| Technology | 1 | 2 | 3 | 4 | 5 |
| Language Arts | 14 | 15 | 16 | 17 | 18 |
| Science | (Optional) | 1 | 2 | 3 | 4 |

| Day | 19 | 20 | 21 | 22 | 23 |
| Technology | 6 | 7 | 8 |
| Language Arts | 19 | 20-T | 21-T |
| Math | |
| Social Studies | |

78
Principles of Technology: The Marriage of Academic and Vocational Education at Leander High School

Mark Kincaid
Administrative Assistant
Leander High School
Leander ISD

Topic C3
Principles of Technology: The Marriage of Academic and Vocational Education at Leander High School

Mark Kincaid
Leander ISD

Principles of Technology: a course that meets the needs of "middle of the road" students and industry/employers.

Principles of Technology is an applied physics course which teaches 95% of the competencies that Physics teaches:

- Mechanics Systems
- Fluids Systems
- Electrical Systems
- Thermal Systems

Fourteen physics concepts are each taught within the above four systems.

A Unit within Principles of Technology consists of:

- Teaching
- Examples
- Guided Practice
- Math Lab
- Hands on Vocational Lab (real work things students will see in industry)

Principles of Technology provides a broad base of skills. It addresses

Problem solving.
Learning how to learn.

Principles of Technology may be used as a springboard along with other sciences for college-bound students, and as a tool for those students who are job-bound.

Some universities accept Principles of Technology as a Science Lab credit for admission (e.g., Texas A&M University, Texas Tech University, MIT, etc.).

*A science credit may not yet be obtained for this course.

Who can teach Principles of Technology?

- Physics/Science teacher
- Industrial Technology teacher
- Agricultural Education teacher
- Trade and Industrial Technology teacher

Students who can take this course:

11 or 12th grade students who have taken or are enrolled in pre-algebra

Videos and materials for Principles of Technology I and II may be obtained from the Texas Education Agency. Contact Neil Ballard at (512) 463-9474.
Physics - Technology Integration

Tony Bertucci
Technology Teacher
Science Academy
Austin ISD

Topic C4
The Science Academy

The Science Academy is a high school within a high school; it is a science magnet school at Johnson High School in Austin ISD. A technology teacher, within the Research and Development course, speaking on robotics teams with a physics teacher. Classes are taught in 2 hour blocks; the physics class is paired with robotics lab, including instruction in drafting, CAD, and electronics. The class uses "generic CAD"; it is cheaper than AutoCAD. For projects, students are responsible for both the design and the performance standards; if the project doesn't work, they get no grade. This 9th grade class integrates conceptual physics with technology.

The Science Academy is a district-wide magnet school. There is discussion to make it a regional magnet school. There are 200 freshmen a year, with 600 total population in the academy. Four years of science and four years of math are required. Most graduates are college-bound. Research and Development is a 11-12th grade elective in the Science Academy. It is a pre-engineering course with 15 CAD stations. Students design, build, and test projects.

The Physics-Technology Class

This class was started last year (1989-1990) as a pilot project in the 9th grade. This year it is a full-time program. Formulas were taken out of the curriculum and replaced with concepts. The class consists of 70% science and 30% technology. There are 2 labs and 1 lecture (1 physics lab, 1 technology lab, 1 lecture). A problem is that these students are stressed timewise. The teacher also works with English teachers; when students have science write-ups, they also count for a grade in English.

There has been a good response to this program. Many students who would never have gone down the technology wing are participating. After 6 weeks, students are working with scale drawings and building to scale.

The math is integrated. Architecture and drafting are combined with geometry. In the drafting/geometry, students work together on the same project, both regular education students and gifted students.

Traditionally, technology classes are considered for lower ability students and magnet classes for higher ability students. This model puts both students together, where they work cooperatively.

Funding

Local funding is used, with no extra funds. Materials come from many sources. Some are industrial donations (interpersonal contacts); broken items are collected; and fully functioning technology labs make some parts.

Technology Labs

There are open technology labs, where students can use the labs as long as there is a teacher present, even if they are not enrolled in that lab. An increased demand on lab time is expected. Class size approximately 20-22.
**Plans**

TSTI is coming in to do a series on holograms and lasers. This will give students different options besides college.

**Emphasis**

There is a need for 4-5 technicians to every engineer in today's work force. Technology is such that continual training and retraining is necessary. This program can help meet some of these needs.
Mathematics Skills Meeting Vocational Needs

*Don Westbrook*
Director of Special Programs & Services
Goose Creek Consolidated ISD

*Sherri Frost*
Mathematics Teacher
Goose Creek Consolidated ISD

Topic C5
Mathematics Skills Meeting Vocational Needs

Don Westbrook
Sherri Frost
Goose Creek Consolidated ISD

Problem

Vocational students have a lack or mathematics, reading, and communication skills, resulting in teachers having trouble teaching the vocational education curriculum. The lack of academic skills resulted in a problem with vocational education success.

Solution

1. Identify philosophy and purpose.
2. Identify 18 TEAMS objectives
3. Have teachers bring Vocational Education curriculum guide to staff development
4. Teachers identify objectives of TEAMS that are essential to their vocational program.
5. Develop lesson plans and activity sheets to teach objectives identified.
6. Pull 4 questions/objectives to make a pretest, using TEAMS format
7. Pre-test students and determine grades (done by aide)
8. Hired Aide with Perkins money
9. Computer program - Skills Bank; Computer lab - JTPA math remediation, bought computers
10. Aide told teachers pretest results
11. Remediate students from pretest during first 6 weeks
12. Post test after 6 weeks
13. Pull out students who still had problems 2 days/week, 45 minutes/day; open in/open out when master skills, go back to vocational labs
14. This year have a math teacher, less pull out. Team teaching within lab. Teaching the teachers how to teach, develop lesson plans and activities.

Special education decides how to remediate their identified students.

There was initial resentment. Vocational education teachers were not comfortable teaching mathematics, and they didn't like students being pulled out. A mistake made was that the vocational education teachers were not sold on the value of mathematics.
Goals

After mathematics program is in place, the goal is to hire a certified teacher in language arts, especially reading.

There needs to be a separate course credit for consumer math.

Develop a modified block schedule - CCC unit: combine mathematics and vocational education.

Certified Mathematics Teacher

The certified mathematics teacher covers 3 campuses. After identification and testing, she begins with basics and builds up. She combines pulling out small groups with going into the lab if a lot of students are having trouble. Regular times are scheduled to go into the lab. She has lesson plans that she shares with the teacher. They look at work and immediate grades. There is no failure until students refuse to do. If they have difficulty, work is immediately redone. Students help each other. They go back to the lab when finished.

In May, they will test the students and evaluate the program. Teachers have input throughout the year. The vocational teachers see the mathematics teacher as a resource/mentor.

Next Year: Vocational education teachers will identify 4 objectives that they feel comfortable teaching, based on what they have learned from the certified mathematics teacher.

Carl Perkins Funds: used for purchasing materials and for salaries. The salaries were funded 75% by Carl Perkins money and 25% local money. This allows teachers to work with ineligible students.
VOCATIONAL MATH CONFERENCE NARRATIVE

Each vocational teacher identifies those math objectives essential for success in that particular vocational class. A vocational math manual that covers all objectives is organized by the math teacher. The manual is issued to each vocational teacher, and includes lesson plans, explanations, worksheets, and keys.

In a summer workshop, vocational teachers, along with the certified math instructor, devise lesson plans and activity sheets which enable the integration of math skills into the existing vocational curriculum.

A prescriptive pre-test is given to each vocational class under the direction of the vocational and math instructor in mid-September. The test is graded by the math teacher and results are given to the vocational teacher. The vocational teacher, with the solicited aid of the math teacher, reviews and reteaches for a period of 4-6 weeks.

At the end of October or first of November, a post-test is given to those students who did not master the pre-test. Graded by the math teacher, the results are then given to the vocational teacher.

If a majority of the class exhibits a deficiency, the identified objective is retaught to the entire class in the vocational classroom. As students master the objective they exit to vocational shop classes. A pull-out program is implemented only if a few students in vocational classes need help. These students are remediated two times a week in a different location for 45 minutes each period. Students who still have problems should remain in class while those who have mastered the identified objectives go to shop classes.

Worksheets and papers are graded and kept by the vocational math teacher. Grading worksheets in class is best when possible so that immediate feedback can be provided and reteaching can take place. Grades are recorded by the vocational math teacher, then averaged and submitted to vocational teachers to be averaged with other vocational grades.

A final test is given to determine mastery and retention. This test should be given in early May to those students who have not passed the post-test.
<table>
<thead>
<tr>
<th>OBJECTIVE NO.</th>
<th>OBJECTIVE DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Select set of numbers order least to greatest.</td>
</tr>
<tr>
<td>2</td>
<td>Rounding of numbers to a particular place value.</td>
</tr>
<tr>
<td>3</td>
<td>Identify equivalent fractions, decimals, and percent.</td>
</tr>
<tr>
<td>4</td>
<td>Convert numbers from exponential notation to standard notation.</td>
</tr>
<tr>
<td>5</td>
<td>Solve problems involving addition, subtraction, and multiplication of fractions and mixed numbers.</td>
</tr>
<tr>
<td>6</td>
<td>Use basic operations to solve problems with decimals.</td>
</tr>
<tr>
<td>7</td>
<td>Solve problems involving addition of integers.</td>
</tr>
<tr>
<td>8</td>
<td>Solve word problems involving multiple operations.</td>
</tr>
<tr>
<td>9</td>
<td>Solve word problems using formulas.</td>
</tr>
<tr>
<td>10</td>
<td>Solve word problems involving proportions.</td>
</tr>
<tr>
<td>11</td>
<td>Solve word problems using percent.</td>
</tr>
<tr>
<td>12</td>
<td>Solve problems involving metric/standard measurements using basic operations.</td>
</tr>
<tr>
<td>13</td>
<td>Solve word problems involving averages.</td>
</tr>
<tr>
<td>14</td>
<td>Solve word problems involving simple probability.</td>
</tr>
<tr>
<td>15</td>
<td>Use information from graphs and tables to solve word problems.</td>
</tr>
<tr>
<td>16</td>
<td>Solve problems involving geometric formulas.</td>
</tr>
<tr>
<td>17</td>
<td>Use geometric properties to solve problems involving geometric shapes.</td>
</tr>
<tr>
<td>18</td>
<td>Solve problems to determine the value of a variable.</td>
</tr>
</tbody>
</table>
SUBJECT: Objective 7 - Integers

AIMS (or purposes): The students will be able to add and subtract both positive and negative integers and make sign changes.

TEACHING AIDS: Overhead projector/ chalkboard

MATERIALS: transparencies

REFERENCES: Vocational Math Manual - Objective 7

PREREQUISITE EXPERIENCE OF THE LEARNERS: The students need to have good addition and subtraction skills and understand what a negative number and a positive number is.

I. PREPARATION (of the learner - motivation)

Lesson 1 - Understanding Positive and Negative Integers

Introduction:
* How do negative and positive integers affect our daily lives?
  - money
  - bank accounts
  - temperature
  - launching of space rockets

* How do negative and positive integers affect this vocational class?
  - answers will vary

Lesson 2 - Adding and Subtracting Negative and Positive Integers

Introduction:
* Review any points from lesson one that need to be stressed.

<table>
<thead>
<tr>
<th>II. PRESENTATION</th>
<th>III. APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>LESSON 1</td>
<td></td>
</tr>
<tr>
<td>Use of number line to identify numbers and their relationship to other numbers on the line.</td>
<td>Overhead transparency of number line</td>
</tr>
<tr>
<td>&quot;Rules of Sign Changes&quot;</td>
<td></td>
</tr>
<tr>
<td>LESSON 2</td>
<td></td>
</tr>
<tr>
<td>&quot;Rules For Adding and Subtracting Integers&quot;</td>
<td></td>
</tr>
<tr>
<td>Use of a number line for adding and subtracting.</td>
<td>Overhead transparency of number lines</td>
</tr>
<tr>
<td>Guided practice - overhead or hand-out</td>
<td>Overhead</td>
</tr>
<tr>
<td>Guided practice - overhead or hand-out</td>
<td></td>
</tr>
</tbody>
</table>
IV. VERIFICATION AND/OR EVALUATION (final check on student’s comprehension of material presented)

Lesson 1  Worksheet - See Vocational Math Manual - Objective 7
Lesson 2  Worksheet - See Vocational Math Manual - Objective 7

V. SUMMARY (Give a brief account of each topic reemphasizing the important points. This summary may be given at any place in the lesson the teacher feels will be profitable to the students)

Lesson 1  Review use of number line and Rules for Sign Changes.
Lesson 2  Review adding and subtracting on a number line, Rules for Adding and Subtracting Integers, and points from Lesson 1 that are needed.
Objective 8
Multiple operations involving addition, subtraction, multiplication and division

1. A Metal Trades class was working on different projects. Each group used the following number of rivets: 5,236; 2,365; 2,589; and 3,365. How many rivets were used in all?

2. A purchase order was made for 17 drills at $38.00 each. If the company paid $569.00, how much did they still owe?

3. An order arrived for 7 bundles of sheets of steel. Each bundle contained 24 sheets. If the sheets are to be divided into 14 jobs, how many sheets of steel will go to each job?

4. A machinist worked six days a week for 4 weeks and made $576.00 per month. How much did the machinist make per week?

5. A machinist is paid $7.00 per hour. If the machinist works 78 hours in two weeks, what will the gross pay be?

Objective 12
Word Problems involving Metric and Customary Measurement

1. A job site needed 18 feet of copper wire, 38 feet of steel wire, and 28 feet of tin wire. How many feet of wire are needed in all?

2. A rod iron pipe 468 inches long is to be cut into equal pieces. How long will each piece of rod be?

3. Three pieces of copper wire were cut from a 60-feet coil. If the lengths of the pieces were 12 feet, 8 feet, and 16 feet, how much of the coil was left?

4. Each box of nuts weighs 2 lbs. 3 oz. If a case contains 16 boxes, how much does the case weigh?

5. Bill worked 3 hrs. 20 min. on Tuesday, 4 hrs. 30 min. on Wednesday, and 6 hrs. 40 min. on Thursday. What is the total amount of time that Bill worked?
Vocational Math Test
Goose Creek Consolidated Independent School district
Welding

ADD
85  674  1727  8572  87,462
63  892  5247  308  70,410
68  480  9182  8793  8,546
47  513  2501  42  76,939
60  276  4798  4692  8,717
  +98  +947  +5033  +217  +44,586

SUBTRACT
732  7093  63,692  8000  50,065
- 476  -4982  -62,946  -724  -595

MULTIPLY
4923  8642  6409  720  4706
x  76  x 4900  x 409  x 807  x 9

DIVIDE
4314 41,237  37 123,939  137 7163  9164,323

DECIMALS
Watch the signs.
.21 327.6
  x .28  156  16.80  1.86  .753
  4.62  .03  2.05
  x 26

Objective 5
Addition, Subtraction, and Multiplication of FRACTIONS
1) 4 1/2 x 2/9  2) 8 7/8 - 7 15/16  3) 4 1/8 + 3 15/16
4) 7/8 x 11/21  5) 9 1/8 - 3 2/5

Objective 6
Addition, Subtraction, Multiplication, and Division of Decimals
.873  1.7  1.16  86.141  .34  5.411.08
.199  .412  .873  27  .125
  4.890  12

.0003  48.26  7.27  10.25  2.5
.007  29.117  4.88

92
REFERENCES AND SOURCES


Developing Integrated Curricula

Jerry Wircenski
Professor
Trade and Industrial Education
University of North Texas

Topic C6
Developing Integrated Curricula

Jerry Wircenski
University of North Texas

"How-to" develop

Elementary teachers know how to integrate. Secondary teachers are specialized and don't know how.

Goals

- Let students know that the 3 R's are important.
- Put academics in vocational classes

*Use curricula that were already there.

Examples

In auto mechanics students were studying brakes. In mathematics, charts and graphs were taught with diagrams from auto mechanics class. English papers were written over seat belt laws and gas mileage requirements.

Students were given cameras to go and take pictures of people in the "real world" using Reading, Writing, Mathematics, and Communication skills.

Teachers gave future lessons to students to get ideas on "hands on" ideas, real world applications. The students supplied GREAT real world applications.

Teachers had community leaders come in and talk about their jobs. They dropped buzz words like "calculate," "solve," and "read" without saying, "Do your math; it's important for your job."
Evaluation of Programs that Integrate Vocational and Academic Education

Jerome T. Kapes
Professor of Educational Psychology and Vocational Education
Texas A&M University

Topic C7
Evaluation of Academic and Vocational Education

Jerome T. Kapes
Texas A&M University

Definition of Evaluation

1. Educational evaluation - making judgements about merit, value, or worth of vocational programs. Based on judgement, someone has to make a decision.

2. Stufflebeam, et al. 1971 Phi Delta Kappan (CIPP model). Educational evaluation is the process of delineating, obtaining, providing useful information for judging decision alternatives. Based on useful information, what do we need to know to make a decision?

Evaluation Models

1. E = (P=O), Evaluation = Performance = Objectives. Based on Ralph Tyler - parent of vocational evaluation. Congruency between performance and behavior. Problem - behavioral objectives are too mechanical, measure parts; not holistic, miss social/citizenship outcomes.

2. E = M, Evaluation = Measurement (e.g., new national test proposed by Bush. Problem: lots of information, but often we do nothing with it).

3. E = PJ, Evaluation = Professional Judgement. Good for complex situations (e.g., certification of programs), use teams of experts to make judgements, but measurement and objectivity may be missing.

(Best to put all three of the above models together for most useful evaluation)


8. Adversary Evaluation (take the pros and cons and blend the two)

Questions to Be Answered (Answers supplied by conference participants):

1. What are the goals of coordinating vocational and academic education?

Could be different in different places.
Improve student performance.
Address needs of whole child.
Address needs of society.
Unify education.
Obey the law - because CPA says we need to.
Make learning more relevant.
Better educated student.
Higher test scores.
More mature choices.
Satisfy industry.
Better work force.
Education for global society.
Competencies necessary for success in life.
Improve relationship thinking.
Retention of students.
Develop a work force.
Eliminate tracking.
Cure ills in education.
Decrease stigma of vocational education.

2. What questions need to be asked?

Does integration work?
Was there a change in student outcomes?
How to do this within our means?
What will be integrated?
What is the effect of integration?
How well do different models work under different conditions (e.g., urban or rural, low SES, etc.)?
How are we going to get the big picture of integration?

3. What criteria could be used?

Drop out rate/graduation rate.
Teacher satisfaction.
Employment.
Change in student attitude/enthusiasm.
Higher level thinking skills.
Transfer of knowledge.
Enrollment changes.
Attendance.
Satisfied employers.
Increase in test scores.
Lower unemployment.
Better trained graduates (also educated).
Teachers that teach student instead of content.
Less drug abuse.
8th Grade Pre-Vocational Program for At-Risk Students

Dianne Petry
Academic Teacher
Plano ISD

Lolly Flores
Academic Teacher
Plano ISD

 Topic C8
Integrating Academics
And
Vocational Programs

I. Introduction

II. Background, History, Origin

III. Outline Program

IV. Identification

V. Forms

VI. Typical Day
Table of Contents

I. Mission Statement

II. Forms
A. Initial Referral
B. Comprehensive Assessment Survey
C. Student Profile
D. Parent Letter
E. Parental Consent
F. Pre-vocational Program Policies
G. Rules
H. Discipline Guidelines
I. Vocational Segment Information Sheet
J. Intake Meeting Checklist
K. Dismissal Form

III. Class Schedule
PRE- VOCATIONAL PROGRAM MISSION STATEMENT

The mission of the Pre-Vocational Program is to produce responsible students that are able to return successfully to the main stream and continue being successful as they move through their academic program toward graduation.

Goals:
1. By the end of a student's tenure he/she will be demonstrating success in academics, wood shop, and functioning successfully in horticulture.
2. To have 100% of our students demonstrate responsible citizenship and good character.
3. To have 100% of our students exhibit good work habits and be responsible for their actions.
4. To have students recognize their vocational abilities through completion of wood projects and working successfully in the horticulture.
5. To achieve support within the school district as well as the community for the projects and services of the pre-vocational program.
6. To return students in a positive frame of mind to the main stream where they will be successful.
7. To raise the awareness of all pre-vocational students about the academic and vocational services available in the high school.
8. To exhibit mastery of the essential elements in science, history, English, and math.

Strategies:
1. We will integrate the teaching and practice of citizenship and good character into every aspect of the curriculum and all our activities.
2. We will work to teach good work habits and have students exhibit the qualities of self responsibility.
3. We will work to continue to add horticulture and wood project customers so as to supply a source of revenue to enable us to pay students for work completed.
4. We will work with each student on an individual basis in order to help the student work to his/her ability and improve decision making skills.
5. We will communicate with the student, the parent/s, and the home school personnel to ensure that the student is progressing to his/her maximum.
6. We will refer students to special programs or other personnel as needed.
7. We will monitor the mastery of the essential elements on an individual basis through formal and informal evaluations.
8. We will assist in the proper placements of pre-vocational students in high school programs.
9. We will demonstrate the value of an education to all pre-vocational students.
INITIAL REFERRAL
Telephone Screening Sheet

Student's Name ___________________________ Age _____ Grade _____

School ____________________ School Contact ______________________

___ Campus Intervention Team meeting has taken place.

___ Student meets criteria (list below).

1. 

2. 

3. 

___ Previous action taken by school

   ___ Special Education testing

   ___ PASP testing

   ___ Other

___ List student's I.T.B.S. scores for

   Math _________

   English _________

___ Is this student a discipline problem?

___ Intake meeting is set for (date) __________________________

___ School will notify parents to attend meeting.

___ School contact will bring the following reports:

   ___ Completed Student Profile Form

   ___ All discipline records

   ___ Current course grades

   ___ Previous action taken by school

   ___ Recommendation from the Campus Intervention Team

___ Inappropriate referral. Pre-vocational made the following recommendations:

1. 

2. 

3. 
COMPREHENSIVE ASSESSMENT SURVEY

NAME:__________________________________________________________
GRADE:_____________ TEACHER:______________________________________

The above named student is being reviewed because of the following reasons:

- Has not been promoted one or more times in grades 1-6
- Is currently failing __________________________
- Failed the ___________________ portion of the TEAMS
- Is currently functioning one year or more below grade level in language arts, reading, or math
- Exhibits other social, developmental, or psycho-social factors which are contributing to failure

The building comprehensive assessment team has met and recommends the following:

- Placement in a continuous progress program
- Tutorials
- Modification of time and subject requirements
- Referral to special education
- Referral to PASP
- Referral to Chapter I services
- Referral to bilingual/ESOL
- Referral to TRAC
- Referral to counseling
- Summer school
- Williams High School Alternative Program for District grades 7-8
- Evening school
- Referral to parent education program
- G.E.D. program
- Referral to truancy program
- Referral to drug/alcohol education program

Comments: ______________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

Reviewed: _________________________________________________________
_________________________________________________________________
## STUDENT PROFILE

<table>
<thead>
<tr>
<th>Student</th>
<th>Grade</th>
<th>Group</th>
<th>Age</th>
<th>Birthdate</th>
</tr>
</thead>
</table>

### Grades: Last year - L.A./Eng.
- Math
- Science
- Soc Studies

### Grades: This year - L.A./Eng.
- Math
- Science
- Soc. Studies
- Other

### Aptitude:
- (Test, Year)
- (Test, Year)
- Verbal
- Non-verbal
- Quantitative
- Full Scale

### Achievement Test Scores:
- Total Language
- Work Study
- Vocabulary
- Reading
- Math Concepts
- Math Problems/Computations

(Do aptitude and achievement align?)
(Do aptitude/achievement and grade scores align?)
Note the problem or inconsistencies areas

### Study Skills:
- a. Is the student dependable in completion of assignments:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never completes work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Always completes work</td>
</tr>
</tbody>
</table>

### Emotional Health:
- Are there home concerns?
- Does the child have a positive self-image?

### Attendance this year and last year:
- Excused
- Unexcused
- Is there a significant difference between years?
- Note absences and tardies in excess

### Is the student in a special program?
- Special Ed
- PASP
- Tutoring
- Speech
- Other

Note the problem or inconsistencies areas
9. What strengths does this student have?

<table>
<thead>
<tr>
<th>reading</th>
<th>writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>attention span</td>
<td>independence</td>
</tr>
<tr>
<td>social skills</td>
<td>organization</td>
</tr>
<tr>
<td>math</td>
<td>motivation</td>
</tr>
<tr>
<td>spelling</td>
<td>completion of assignments</td>
</tr>
<tr>
<td>listening skills</td>
<td></td>
</tr>
<tr>
<td>on-task behavior (stick-to-itiveness)</td>
<td></td>
</tr>
<tr>
<td>ability to understand and apply general concepts</td>
<td></td>
</tr>
</tbody>
</table>

10. What weakness does he have?

<table>
<thead>
<tr>
<th>reading</th>
<th>writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>attention span</td>
<td>independence</td>
</tr>
<tr>
<td>social skills</td>
<td>organization</td>
</tr>
<tr>
<td>math</td>
<td>motivation</td>
</tr>
<tr>
<td>spelling</td>
<td>completion of assignments</td>
</tr>
<tr>
<td>listening skills</td>
<td></td>
</tr>
<tr>
<td>on-task behavior (stick-to-itiveness)</td>
<td></td>
</tr>
<tr>
<td>ability to understand and apply general concepts</td>
<td></td>
</tr>
</tbody>
</table>

11. Is he involved with extra curricular activities? If so, what?

12. Is he involved with the community in other ways?

13. Any health concerns?

14. What interventions have been tried?
Dear Parent:

Your student will begin the Pre-vocational Program on _______. The program area is located on the north side of the Williams High School campus at 1717 17th Street. While in this alternative setting, your student will receive instruction in Math, Science, English, History, and vocational training. He/she will need to bring school books, pens, and paper.

School begins at 8:30 a.m. and ends at 3:30 p.m. We ask that your student come directly into the Pre-vocational Center. The center will be open at 8:00 a.m. Pre-vocational students are not allowed to spend time in the Williams parking lot before school starts. Students will, however, have access to the Williams cafeteria for lunch.

Attendance will be kept here and reported to the home school. If your student is to be absent, please call 578-0143 to report the absence before 9:00 a.m.

As parent or legal guardian of this student you will be expected to provide transportation to and from school and to attend parent/teacher/student conferences. We plan to make this experience as positive and helpful for your student as we can. If you have questions, please feel free to call us.

Sincerely,

PRE-VOCATIONAL STAFF

Academic
Dianne Petty and Lolly Flores

Vocational
Gary Woody, Terry Combs and Donna Morris
Parent's Signature

Student's Signature

Intervention Team Chairman's Signature

Parental Consent:

I hereby give the staff at the Prevocational Center permission to use all resources available through Plano Independent School District to devise an ongoing intervention program for my son/daughter. This may include drug/alcohol preassessments and other assistance available through the Plano ISD Student Services Department. There will be ongoing contact with parents to report on any activity of this nature.

Student's starting Date: ________________________________

109
PREVOCATIONAL PROGRAM POLICIES

Acceptance into this Program is a privilege. You will be expected to follow the same rules that apply at your home campus. We have certain expectations outlined as follows:

1. Be on time. Be in your seat at 8:30 a.m.

2. Complete assignments and allow other students to complete theirs.

3. Observe program rules:
   a. Remain in the building throughout your school day.
   b. Follow District dress code.
   c. Do not smoke in the school building or on school property. No tobacco products are allowed in school. Products will be confiscated.
      1) First offense: parental contact with 1-day placement in inschool suspension.
      2) Second offense: parental conference and a 2-day placement in inschool suspension.
      3) Third offense: parental conference with possible placement in the TRAC program or returned to home campus.
   d. Do not mark, write, or carve on walls, chairs, desks, floors, doors, etc.
   e. Do not loiter in the high school parking lot before or after school hours.
   f. Observe break-time; return to class on time.

Failure to comply with these Prevocational Program policies may result in your dismissal from the Program. By meeting these expectations, you invest in your success in the Prevocational Program.
Williams Pre-Vocational

This program is set up to receive only those students in need of an alternative setting due to an inability to successfully perform in the regular school environment. This program is an extension to alternative education.

Students will adhere to the Williams Pre-Vocational guidelines.

1. Students are expected to come to school with a positive, productive attitude.

2. Pre-Vocational teachers will instruct the students. Students can expect the course work to differ somewhat from that on their home school campus.

3. Students are expected to cooperate with teachers and to complete all assignments. Arguing with the teachers will not be tolerated.

4. School begins at 8:30. When students arrive on campus, they must immediately enter the building. All restroom needs must be taken care of before entering the classroom. Once students are in the classroom, they cannot leave.

5. Students are expected to bring all of their materials to class every day (paper, pens, notebooks, etc.)

6. Each student is expected to keep his/her desk and area neat and clean. Students do not mark or carve on anything in the building (bathroom, desks, chairs, walls, etc.). Students are expected to sit with their feet on the floor and facing their own desks unless otherwise instructed by the teacher.

7. Phones are off limits to students. If students require the use of a phone, they must ask for permission to use the office phone. Students do not use the phone during class hours.

8. Students are expected to follow the District's dress code; it will be enforced. This means no tank tops, dog collars, spiked jewelry, and no shirt with alcohol, profanity, drug, or offensive symbols will be allowed.

9. The District attendance policy will be enforced. Excessive absences will be handled through truancy court.

10. Smoking is not allowed in the school building or on the school campus. The campus consists of the parking lot, tennis courts, and all property around the building.

11. Failure to follow the Williams Pre-Vocational guidelines may result in your dismissal from the program. By meeting these expectations, you invest in your success.
Discipline Guidelines. Williams Pre-Vocational

1. Inappropriate behavior will be handled by the teacher through primary action as the teacher sees fit.
   a. Teacher asks the student to cease.
   b. Any other creative method which the teacher may want to employ (seating arrangement, etc.).

2. If the student continues inappropriate behavior after primary action, the following procedure will be followed by the teacher:
   a. Student sent to time-out area.
   b. Student will remain in time-out area until released by teacher.
   c. Student must remain quiet and in control while in the time-out area.
   d. If student will not follow time-out guidelines, he/she will be sent to disciplinarian in charge who will automatically assign a half-hour detention.
   e. Severe discipline infractions will be referred immediately to disciplinarian in charge (profanity to teacher; posing physical threat to teacher, other student, self; violation of District drug/alcohol policies).
   f. A repetition of inappropriate or disruptive behavior will result in a parent/teacher phone conference.
   g. Any further problems will require an in-building parent/teacher conference.
   h. If necessary a Central Intervention meeting will be held. This could result in the following action:
      1. Home school meeting in order to return student to home campus.
      2. TRAC placement for further disciplinary action.

3. Smoking
   a. First offense - Teacher/student conference; parent notified.
   b. Second offense - In-building parent/teacher conference.
   c. Third offense - Central Intervention meeting which could result in the following:
      1. Return to home school.
      2. TRAC placement.

4. Student will be sent home only as a last resort (parent will be notified before the student is sent home).

5. The goal of these guidelines is to help the student:
   a. Work through his/her problems.
   b. Face the consequences of his/her behavior.
I understand the guidelines of the Williams Pre-Vocational program.

------------------------------------------  ------------------------
Parent's Signature  Date

------------------------------------------  ------------------------
Student's Signature  Date
PRE-VOCATIONAL PROGRAM

VOCATIONAL SEGMENT INFORMATION SHEET

For students to be properly enrolled in the vocational segment, this form MUST be accompanied with the students official class schedule from their home school and a photo copy of the students social security card.

STUDENT NAME______________________________________________________________

ADDRESS__________________________________________________ PHONE #__________

BIRTHDATE_________GRADE_____ HOME SCHOOL__________________________

HOME SCHOOL COUNSELOR_______________________________

SOCIAL SECURITY #____________________________________

PERMANENT ADDRESS_____________________________________

PARENT’S NAME________________________________________ HOME PHONE#_______

_________________________________ WORK PHONE #________

SAFETY AND PROCEDURE INFORMATION

I understand that in the vocational segment, when the students are in the wood shop they are expected to wear eye safety protection as well as utilize all safety features on all equipment and exhibit safe behavior in the shop and horticulture areas at all times. I also understand that in horticulture the students may be working in the greenhouse or on another campus. I understand the students must work each day in a safe, conscientious manner and exhibit good behavior as would be expected of a/an student/employee. I understand that the students will be paid on the 15th of the month following the month worked or the month following the sale of projects. I understand that students will not be paid for projects completed until projects have been sold and money has been collected by the Pre-voc Program. I also understand that students WILL NOT be paid until all paperwork required for employment by PISD has been properly completed and a copy of social security card and official class schedule are on file.

STUDENT____________________________________________________

PARENT____________________________________________________

DATE____________________________________________________
Checklist
Intake Meeting

___ Voluntary
___ Do not provide transportation
___ Three-week trial
___ Student evaluation after 3 weeks
   - return to home campus
   - remain in the program
___ Evaluated at the end of next six weeks
___ Most students will remain for one semester
___ Half day academics - English, math, history, science
___ Half day vocational - woodworking, horticulture, life skills
   - can receive money in woodworking and horticulture
___ Academics comes first
___ Must complete all assigned work - accept no zeroes
___ If work is incomplete/needs to be reworked - student will be called out of afternoon classes
___ This program doesn't affect 9th grade placement
___ This program is not special education or PASP - we teach the regular 8th grade curriculum
___ Lunch is between Williams A and B lunches
___ Students are not allowed in Williams except for lunch and life skills
___ Discipline - see handout
___ Need a social security card - not just the number
___ Free/Reduced price lunch
___ Smoking
Student's Name ___________________________ Age ___ Grade ___
School ________________________________ School Conta __________________

____________________________ has been assigned to the Pre-vocational program since _______________.
____________________________ will return to __________________ on _______________.

We propose the following recommendations to promote continued success:

1. If possible assign an adult mentor.
2. Place student on a daily assignment sheet.
3. Involve parents often, positively or negatively.
4. ________________________________
5. ________________________________

Respectfully,
Pre-vocational Academic Staff

Lolly Flores
Dianneetty

Comments:
**PRE-VOCATIONAL CLASS SCHEDULE**

<table>
<thead>
<tr>
<th>PERIOD</th>
<th>TIME</th>
<th>SUBJECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1ST. PERIOD</td>
<td>8:35-9:25</td>
<td>ENGLISH/Earth Science</td>
</tr>
<tr>
<td>2ND. PERIOD</td>
<td>9:35-10:25</td>
<td>Earth Science/English</td>
</tr>
<tr>
<td>3RD. PERIOD</td>
<td>10:35-11:25</td>
<td>Math/American History</td>
</tr>
<tr>
<td>4TH. PERIOD</td>
<td>11:35-12:20</td>
<td>American History/Math</td>
</tr>
<tr>
<td>LUNCH</td>
<td>12:25-1:00</td>
<td></td>
</tr>
<tr>
<td>ACTIVITY PERIOD</td>
<td>1:00-1:30</td>
<td>Activities</td>
</tr>
<tr>
<td>5TH PERIOD</td>
<td>1:30-2:30</td>
<td>Life Skills/Vocational/Academic Tutoring</td>
</tr>
<tr>
<td>6TH PERIOD</td>
<td>2:30-3:30</td>
<td>Vocational: Woodworking/Horticulture</td>
</tr>
</tbody>
</table>

*SCHEDULE IS SOMEWHAT FLEXIBLE DUE TO THE NATURE/SETUP OF THIS PROGRAM.*
Table of Contents

I. Reasons For Identification

II. Assessment/Implementation of Strategy

III. At-Risk Identification
REASONS FOR AT-RISK IDENTIFICATION

1. Ability/Aptitude
2. Lack of Effort/Motivation
3. Language Problems
4. Poor Educational Background
5. Improper Grouping/Placement
6. Frequent Moves
7. Behavior Problems
8. Attendance
ASSESSMENT/IMPLEMENTATION OF INTERVENTION STRATEGIES

1. Identification (Classroom teacher)
   a. Identify by stated criteria
   b. Refer to building assessment team (Student presently in danger of failing course)

2. Assessment of Needs - Building Assessment Forms
   (Principal, Team Leader, Counselor, Support Personnel)

3. Determination of Student's Remediation Needs
   - intensive remediation in language arts, reading and math by increasing time allotments
   - tutorials
   - Plano Academic Support Program
   - summer school
   - counseling
   - peer tutoring
   - parent involvement
   - referral to special education
   - Chapter I services (where available)
   - TRAC (I-IV)
   - Williams Pre-vocational Program for Middle School Students grades 7-8
   - evening school
   - parenting program
   - G.E.D. program
   - truancy program
   - drug/alcohol education program

4. Notification of Parents/Guardian

5. Implementation of Program
AT-RISK IDENTIFICATION

Grades 1–6

1. Have not been promoted one or more times in grades 1–6

2. Have failed one or more basic subjects (language arts, math, science, or social studies) at any six-weeks. To be reviewed each six-weeks

3. Have failed to meet mastery requirements on any of the three areas of the most recent TEAMS test

4. Are one year or more below grade level in language arts, reading, or math

5. Exhibit other social, developmental, or psycho-social factors which contribute to the student’s ability to progress academically

Additionally:

Any student in danger of failing a course or who is not being successful for any reason may be considered as “at-risk” and be referred to the building assessment team.

Grades 7–8

1. Have not been promoted one or more times in grades 1–6

2. Are two or more years below grade level in reading or mathematics

3. Have failed at least two courses in one or more semesters

4. Have failed to meet mastery requirements on any of the three areas of the most recent TEAMS test

5. Exhibit other social, developmental, or psycho-social factors which contribute to the student’s inability to progress academically

Additionally:

Any student in danger of failing a course or who is not being successful for any reason may be considered as “at-risk” and be referred to the building assessment team.
Grades 9–12

1. Have not been promoted one or more times in grades 1–8 and continues to be unable to master the essential elements at their level

2. Are two or more years below grade level in reading or mathematics

3. Have failed at least two courses in one or more semesters and are not required to graduate within four years of the time they entered the ninth grade

4. Have failed to meet the mastery requirements in any of the three areas of the most recent TEAMS test

5. Exhibit other social, developmental, or psycho-social factors which contribute to their inability to progress academically

Additionally:
Any student in danger of failing a course or who is not being successful for any reason may be considered as "at-risk" and be referred to the building assessment team.
Integration of Academics and Vocational Education
"West of the Pecos Style"

Steve Forsythe
Agriscience Instructor
Department Chair
Ysleta Agriscience Department
El Paso, Texas

Topic C9
Integration of Academics and Vocational Education
"West of the Pecos Style"

Steve Forsythe
Ysleta ISD

Effective learning has to be in the local context. The population of El Paso is 62,000; the population of Ysleta ISD is 48,000. In Ysleta ISD, 73-75% of the population are single parent families, and there is a large senior citizen population. The median income is $7,000 to $10,000. Jobs are changing; there is a trend toward continual urbanization. "White flight" exists, and there are new groups moving in. Most are limited English proficient and poor. About 23,000 to 25,000 people have no running water or sewer. The Colonias are unregulated neighborhoods, with no good drinking water wells. There is water rationing; there are 35 "water cops." El Paso is the most unsafe city in the world; it is half a mile from the Mexican border where there are no pollution regulations. Along with the water situation, there is a great deal of air pollution.

In their Agriscience course, students interview the Colonia people about their environment. The English teacher works with the students on grammar. For one assignment, they get credit in both Agriscience and English. Teachers stress leadership skills, responsibility, and public speaking.

Both teachers coordinate their curricula. In discussing air quality and quality of life, the English teacher assigns The Jungle by Upton Sinclair. In Agriscience, students compare the quality of life in El Paso with another U. S. city. They consider the environment, education, parks, etc. They interview citizens and prioritize the quality of life issues.

Other topics covered include the preservation of national resources and the National Trade Agreement. Students developed and conducted a survey where they examined how lifting trade embargos would affect the El Paso environment. Thought questions that affect daily life are stressed.
Iacorporating Language Arts into Vocational Classrooms

Debbie Johnson
Home Economics Coordinator
Taft High School
Northside ISD

Rebecca Miller
English Teacher
Taft High School
Northside ISD

Topic C10
THE WRITING PROCESS

"How can I know what I think until I see what I say?" E.M. Forster

Writing is a key to understanding.

Writing improves retention.
Writing increases understanding.
Writing facilitates evaluation, synthesis, and analysis.

The Writing Process

Prewriting
Writing to learn—notetaking
responding
Idea generation—brainstorming
clustering
free writing
cubing

Writing
Composing
Organizing
Audience analysis

Postwriting
Editing
Revising

Applying the Process

Response Journals
What happened?
Student response?

Class Anthology
Writing for publication

On-the-Job Lessons
Guide for Beginners
Funniest Experience
Colorful Characters

Writing on the Job
Children's Book

Qualities of Short Stories
Descriptive Writing
Narrative Writing
Audience Analysis
GUIDELINES FOR WRITING YOUR CHILDREN'S BOOK

1. Assignment must be in book form. Size will vary, but the book must be bound in some manner and have a sturdy cover.

2. Books written on notebook paper will not be accepted.

3. Books must be at least sixteen pages in length. Each of the sixteen pages must contain an illustration or portion of the story line.

4. In addition to the sixteen actual pages, you must include a title page, an author's page, and an end sheet.

5. Books must be illustrated in some manner.

6. Books will be graded according to the following criteria:
   a. Originality and creativity.
   b. Story line: Does it incorporate the elements of the short story?
   c. Illustrations: Do the illustrations enhance the story? Are they colorful? Are they appropriate for your audience?
   d. Format: Is the book attractive? Is the writing legible and neat? Are all errors in spelling and/or punctuation eliminated?

7. WHTKL Award Presentation: Once all books are in, they will be considered as nominees for the William Howard Taft Kiddie Lit Awards. These awards are both prestigious and sought-after! Awards will be given for story line and illustrations. There will be a first and second place award for each category.

8. GET BUSY! HAVE FUN! BOOKS WILL BE DUE ON _____________!
Writing to Learn in the Content Areas

Although the English teacher may choose to integrate learning to write and writing to learn, teachers in other content areas using the writing to learn approach should not dwell on grammar, spelling, or other technical aspects of language. The general rule should be: If it does not interfere with clarity of meaning, ignore it. The demands of learning content require that technical matters be de-emphasized except where they interfere with the clear transmission of ideas. This is not to say that a teacher could not reasonably expect students to spell correctly those terms that are unique to a given content area, e.g., in biology such terms as “mitosis” and “osmosis.” Each teacher must decide when a given technical error is worth bringing to the student writer’s attention. But under no circumstances should the teacher read through a student’s paper deliberately looking for each misspelling, comma fault, or missing period. In evaluating writing, there is a tendency to slip into this habit, rather than to evaluate the quality of the content.

The teacher using the writing to learn approach needs to be concerned with ideas and their clear presentation. Evaluation should be based on the completeness, logic, and clarity of the thoughts expressed. Teachers need to determine whether the student writer understands what he is writing about; whether the information cited is correct, complete, and logically presented; and whether the work reflects real thought on the part of the student. If teachers conduct this type of evaluation of student writing, there is simply not time to deal with the mechanics of writing.

In a well-articulated program there should be cooperation between the faculty involved in teaching the mechanics of writing and those using the writing to learn approach in the content areas. For example, a science teacher concerned about a grammatical problem in a student’s lab report might refer the problem to the appropriate English teacher. This puts the English teacher in the unique position of helping students both to learn to write and to write to learn; the problems inherent in balancing those two roles will be addressed elsewhere in this fastback.

Student writers should also be aware that they write for a variety of audiences: teachers, themselves, other students, and assorted other individuals. When using the writing to learn approach, it is the responsibility of the content area teacher to ensure that students know for whom they are writing. It is the English teacher’s role to ensure that, once the audience is known, the student has some idea of how to proceed.

What can teachers do in their classrooms to capitalize on the writing to learn approach? There are dozens of ways to integrate writing activities into content areas at the secondary level. The following list by Stephen Tchudi has a method applicable for every content area:

Content Area Writing Activities*

Journals and diaries (real or imaginary)
Biographical sketches
Anecdotes and stories: from experience, as told by others
Thumbnail sketches:
  of famous people
  of places
  of content ideas
  of historical events
Guess who/what descriptions
Letters: personal reactions, observations, informational persuasive:
  to the editor
  to public officials
  to imaginary people
  from imaginary places
Requests
Applications

Home Economics

Once characterized by cooking, sewing, and personal care, home economics today covers myriad topics, from design and fashion merchandising to consumerism and family relationships. Today's broad home economics curriculum has many opportunities for the use of writing in the classroom.

Television Script Writing

Students might develop their own "Galloping Gourmet" 30-minute television program for a unit on foods and cooking. In developing the script and commercials for such a program, students would learn a great deal about food and videotape production. Students would need to understand thoroughly the recipe and the process involved to develop a clear and complete written script, and they would be forced to consider what is happening as the process is followed. Camera directions are needed, and the dialogue must be coordinated with the action. If commercials are also included, there will be opportunity for creative humor. To develop a 30-minute program, students would have to pay attention to timing and make a careful selection of words and content. Such an experience would be enjoyable for students; and it would complement units of study that deal with television, advertising, and cooking.

A Day in the Life of...

As students investigate the career possibilities in home economics, a good activity is to ask them to research thoroughly a career field of their choice and then to write a narrative describing a fictional workday for themselves in that role. In order for such a narrative to be accurate, the writer will need a thorough understanding of the career field and its everyday expectations. Someone writing about being a dietitian in a nursing home will need to investigate thoroughly that role in order to write effectively about it; the interested student might wish to interview a dietitian to gain first-hand insight into the job. Such a writing assignment requires a high degree of organizational skill, knowledge of the terminology used in that career area, and clear descriptive prose. In completing such an assignment, the student will gain a great deal more insight than could come from simply reading about the career. Writing about the career field in concrete terms makes the assignment personally relevant.

Written Reactions to Films

There are many excellent films available on aging and family relationships for use in home economics classrooms. One example is Peege (1974), which is about a family's Christmas visit to their stroke-crippled grandmother, nicknamed "Peege," who lives in a nursing home. It is a moving film about love and the roles grandmothers play in our lives, as seen through the eyes of the family members. It frequently brings tears to the eyes of students and forces students to think seriously about their own family relationships. This kind of film makes students want to react in writing at a personal level and to re-examine their relationships with parents and grandparents. While the writing serves as an excellent prelude to class discussion, it is a highly relevant personal learning experience in itself. Such a writing exercise is well suited to a personal journal that is read by the teacher only at the invitation of the student. Such private writing encourages personal growth.
Closing Remarks

Patricia S. Lynch
Texas A&M University

General Session
Closing Remarks

Patricia S. Lynch
Texas A&M University

The turnout for this workshop was great. There were over 180 participants; considering that this workshop was not highly publicized, this indicates a great interest in helping students by integrating academic and vocational education.

The ten presenters who discussed ways they were integrating academic and vocational education in their districts were just a sampling. Although this integration is a new initiative from the Carl D. Perkins Vocational and Applied Technology Education Act, some schools have already realized the benefit to their students and are implementing integration programs. Many of the exciting things happening in the state are the result of good teachers who get together with each other and work together to make school more relevant for their students. They are driven by concern for their students rather than by legislation.

We hope that this workshop is just a beginning, and that people attending go back and try new things in their districts. Share what has been learned with others and continue to work to improve the education of students and make them aware of how all subjects they are taught fit together and apply in the real world.
Please rate each session that you attended by circling the appropriate number. A rating of 1 is the lowest and 5 the highest. Please feel free to make any comments on the back of this form. Thank you.

### THURSDAY SESSIONS

<table>
<thead>
<tr>
<th>Session</th>
<th>low</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>high</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keynote Address - Jerry Pepple</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Group Working Session</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

### FRIDAY SESSIONS

<table>
<thead>
<tr>
<th>Session</th>
<th>low</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Featured Speaker - Michelle Sarkees-Wircenski</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>TEA Panel Presentation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Topic C1 - Mary Hendrix</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Topic C2 - Cam O'Keefe</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Topic C3 - Mark Kincaid</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Topic C4 - Tony Bertucci</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Topic C5 - Don Westbrook</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Topic C6 - Jerry Wircenski</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Topic C7 - Jerome Kapes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Topic C8 - Dianne Petty</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Topic C9 - Steve Forsythe</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Topic C10 - Debbie Johnson</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

### MISCELLANEOUS

<table>
<thead>
<tr>
<th>Session</th>
<th>low</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>high</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-registration Procedures</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Registration Procedures</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Conference Site</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Reception (Thursday evening)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Luncheon (Friday)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Participants were asked to rate each session attended from 1 (low) to 5 (high). Mean responses and number of responses are reported below.

**THURSDAY SESSIONS**

<table>
<thead>
<tr>
<th>Session</th>
<th>Rating</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keynote Address - Jerry Pepple</td>
<td>3.53</td>
<td>47</td>
</tr>
<tr>
<td>Group Working Session</td>
<td>3.76</td>
<td>49</td>
</tr>
</tbody>
</table>

**FRIDAY SESSIONS**

<table>
<thead>
<tr>
<th>Session</th>
<th>Rating</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Featured Speaker - Michelle Sarkees-Wircenski</td>
<td>4.80</td>
<td>49</td>
</tr>
<tr>
<td>TEA Panel Presentation</td>
<td>2.97</td>
<td>37</td>
</tr>
<tr>
<td>Topic C1 - Mary Hendrix</td>
<td>4.29</td>
<td>24</td>
</tr>
<tr>
<td>Topic C2 - Cam O'Keefe</td>
<td>4.40</td>
<td>10</td>
</tr>
<tr>
<td>Topic C3 - Mark Kincaid</td>
<td>4.43</td>
<td>7</td>
</tr>
<tr>
<td>Topic C4 - Tony Bertucci</td>
<td>3.78</td>
<td>9</td>
</tr>
<tr>
<td>Topic C5 - Don Westbrooks</td>
<td>4.62</td>
<td>13</td>
</tr>
<tr>
<td>Topic C6 - Jerry Wircenski</td>
<td>3.90</td>
<td>21</td>
</tr>
<tr>
<td>Topic C7 - Jerome Kapes</td>
<td>3.46</td>
<td>13</td>
</tr>
<tr>
<td>Topic C8 - Dianne Petty</td>
<td>4.70</td>
<td>10</td>
</tr>
<tr>
<td>Topic C9 - Steve Forsythe</td>
<td>4.00</td>
<td>9</td>
</tr>
<tr>
<td>Topic C10 - Debbie Johnson</td>
<td>4.50</td>
<td>16</td>
</tr>
</tbody>
</table>

**MISCELLANEOUS**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Rating</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-registration Procedures</td>
<td>4.64</td>
<td>44</td>
</tr>
<tr>
<td>Registration Procedures</td>
<td>4.52</td>
<td>33</td>
</tr>
<tr>
<td>Conference Site</td>
<td>4.44</td>
<td>48</td>
</tr>
<tr>
<td>Reception (Thursday evening)</td>
<td>2.49</td>
<td>37</td>
</tr>
<tr>
<td>Luncheon (Friday)</td>
<td>4.51</td>
<td>43</td>
</tr>
</tbody>
</table>
Appendix A

Workshop Participants
Integrating Academic and Vocational Education Workshop
April 18-19, 1991

Speakers

Jerry D. Pepple
Michelle Sarkees-Wircenski
Grace Grimes
Robert Patterson
Mary Hendrix
Carr O'Keefe
Clif Wendel
Karen Kamenzind
Susan Schwausch
Mark Kincaid
Tony Bertucci
Don Westbrook
Sherri Frost
Jerry Wircenski
Jerome Kapes
Dianne Petty
Lolly Flores
Steve Forsythe
Rebecca Miller
Debbie Johnson
Daisy Whisenant

University of Illinois
University of North Texas
Texas Education Agency
Texas Education Agency
East Texas State University
University of Texas - Austin
Round Rock ISD
Round Rock ISD
Round Rock ISD
Leander ISD
Austin ISD
Goose Creek Consolidated ISD
Goose Creek Consolidated ISD
University of North Texas
Texas A&M University
Plano ISD
Plano ISD
Ysleta ISD
Northside ISD
Northside ISD

Participants

Silver Group

Roberta Abelman
Pamela Fails
Gwen Keefer
Judy Wall
Ann Laquey
Diane Taylor
Delmar Day
Billy White
Dennis Freeman
Loretta Allen
Sharon Pierce
Ken Von Gonten
Ruth Neal
Margaret Lindsey - Group Leader

San Antonio ISD
Lexington High School
Canutillo ISD
Fort Worth ISD
Region XIII ESC
Angleton ISD
Jacksonboro High School
Halton High School
West Hardin CISD
Region XII ESC
Texas Education Agency
Belton ISD
Texas Education Agency
Austin ISD
Yellow Group

Stephen Harper
Ed Foster
Mary LeBoeuf
Donald Bennett
Jo Anne McBrayer
Jackie Nolte
Bettie Herring
Marsha Lyons
Jimmie Scruggs
Jewel Lockridge
Karen Hibbs
Linda Valdez
Susan Tolson
Linda Patton - Group Leader

Morton ISD
Birdville ISD
Texas City ISD
Cleburne ISD
New Braunfels ISD
Canyon High School
Fort Worth ISD
Austin ISD
Edgewood ISD
Waco ISD
Birdville ISD
Corpus Christi ISD
Texas Education Agency
Texas A&M University

Red Group

Dennis Swanson
Elaine Hall
Doris Henson
Jean Lane
Lugene Tucker
Jerry Knight
Carl Peterson
C. J. Green
Leonard Thielen
David Childs
Laurel Flanagan - Group Leader

Austin ISD
Goose Creek CISD
Brazos High School
Fort Worth ISD
Tyler ISD
Mansfield ISD
Lexington ISD
San Antonio ISD
McAllen ISD
Texas Education Agency
Spring ISD

Orange Group

Fredda Schooler
Norma Jean Borchard
Edward Kendall
Sue Bell
Travis Winn
Alonzo Wood
Mary Howard
Carol Winkler
Nancy Stout
Jerry Wircenski
Diana Gutierrez
Jack Risinger
Sara Nichols
Judy Hetherly - Group Leader

Morton ISD
Robstown ISD
Guthrie ISD
Tyler ISD
Everman ISD
College Station ISD
San Antonio ISD
Lexington ISD
Midland ISD
North Texas University
Corpus Christi ISD
Texas Education Agency
Texas Education Agency

Green Group

Bob Burkett
Thomas Peterson
Bobby West

Guthrie ISD
San Antonio ISD
Hutto ISD
Buford Neal  
Nancy Chambers  
Linda McLain  
Karen Garland  
Vivian Eads  
Barbara Pinkston  
Marie Maddox  
Sherri Frost  
Bobby Meigs  
Cindy Gruner  
Inez Garcia  
Susan Kemp - Group Leader  

Blue Group  
Mabyn Day  
Frank Volhecht  
Jacquelyn Hall  
Maggie Rice  
Sally Black  
John Ruth Whitworth  
Rick Vaculin  
Tom Gregory  
Leonard Pawlik  
Yvonne Pratt  
Carl Reynolds  
Ron Winkelmann  
Neil Ballard  
Rick Hernandez - Group Leader  

Neon Yellow Group  
Sylvia Guerra  
Helen Berry  
Cynthia Norris  
Loretta Edmiston  
Judy Beloat  
John Kinnett  
Henry Burgoon  
Jesse Cummings  
Don Westbrook  
Ken Ford  
Travis Hayden  
James Cogdell  
Estelle Geno  
Neil Jeter - Group Leader  

Black Group  
Kyle Collier  
Wesley Odell  
Pat Montgomery  
Sherrie Thornhill  
Pam Steen  

Fort Worth ISD  
Morton ISD  
Eanes ISD  
Comal ISD  
Waco ISD  
Center ISD  
San Antonio ISD  
Goose Creek CISD  
Silsbee ISD  
Texas Education Agency  
Texas Education Agency  
Austin ISD  

Silsbee ISD  
Seguin ISD  
San Antonio ISD  
?eander ISD  
Goose Creek CISD  
Balcones Special Services Coop.  
Rockdale High School  
Tyler ISD  
Beeville ISD  
Graham ISD  
Gregory Portland ISD  
Texas Education Agency  
Texas Education Agency  
Texas A&M University  

Edinburg ISD  
Brazos High School  
Smithson Valley High School  
Hutto ISD  
Edgewood ISD  
Austin ISD  
Birdville ISD  
Fort Worth ISD  
Goose Creek CISD  
Graham ISD  
Floresville ISD  
Texas Education Agency  
Waco ISD  
Texas Education Agency  

Morton ISD  
Comal ISD  
Angleton High School  
Silsbee High School  
Tyler ISD
<table>
<thead>
<tr>
<th>Group</th>
<th>Members</th>
<th>Hometowns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold Group</td>
<td>Linda Kelly, Ana Tellez-Poland, Joe Luis Gonzalez, William Greer, Bob Patterson, Bill Welkener, Paula Martinez, Bob Gordon, E. Tyrone, Rae Wyatt Queen</td>
<td>Round Rock ISD, Region XX ESC, Fox Tech High School, Fort Worth ISD, Texas Education Agency, Austwell-Tivoli ISD, Corpus Christi ISD, Texas Education Agency, Texas Education Agency, Spring ISD</td>
</tr>
<tr>
<td>Neon Green Group</td>
<td>Vondell Keeton, Dana Basco, Al Suttles, Betty Jennings, Helen Smith, Judy Frye, Martin Schubert, Frank Perez, Corky Lockmiller, Carol Mayo, Ted Henley, Bobby LaBouve</td>
<td>San Antonio ISD, Hutto ISD, Austin ISD, Houston ISD, Fort Worth ISD, Guthrie CSD, Lexington ISD, Robstown High School, Hereford ISD, Northside ISD, Texas Education Agency, Texas Education Agency</td>
</tr>
<tr>
<td>Purple Group</td>
<td>Sara Toone English, Otila Gonzalez, Ray Fortner, John W. Key, Robert Sughrue, Billie Franke, Dianna Oliver, Don Beeme, Dee Monroe, Gloria Thomas, Harold Barclay, Patricia Lynch</td>
<td>Graham ISD, San Felipe Del Rio CISD, Mt. Pleasant ISD, Spring Branch ISD, Lexington ISD, Austin ISD, Jacksboro ISD, El Paso ISD, Texas Education Agency, Texas Education Agency, La Porte ISD, Texas A&amp;M University</td>
</tr>
</tbody>
</table>

*Note: The table is not fully visible due to the truncation of the text.*
Appendix B

Texas Education Agency Staff
Curriculum and Instruction
Vocational Education
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Telephone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grace Grimes</td>
<td>Assistant Commissioner, Curriculum and Instruction</td>
<td>463-9596</td>
</tr>
<tr>
<td>Leroy F. Psencik</td>
<td>Director, General Education</td>
<td>463-9581</td>
</tr>
<tr>
<td>Sally Spencer Wiedemann</td>
<td>Director of Programs, Business Education</td>
<td>463-9556</td>
</tr>
<tr>
<td>Sunny Thomas</td>
<td>Director of Programs, School Health</td>
<td>463-9501</td>
</tr>
<tr>
<td>Jean Cameron Jones</td>
<td>Director of Programs, Prekindergarten and Kindergarten Education</td>
<td>463-9556</td>
</tr>
<tr>
<td>Glenn Peavy</td>
<td>Director of Programs, Driver Education</td>
<td>463-9556</td>
</tr>
<tr>
<td>John Sommer</td>
<td>Director of Programs, Fine Arts</td>
<td>463-9556</td>
</tr>
<tr>
<td>Bobby W. LaBouve</td>
<td>Director of Programs, Languages</td>
<td>463-9556</td>
</tr>
<tr>
<td>Sylvia Rendon</td>
<td>Director of Programs, English Language Arts</td>
<td>463-9585</td>
</tr>
<tr>
<td>Sharon O'Neal</td>
<td>Director of Programs, Reading</td>
<td>463-9585</td>
</tr>
<tr>
<td>Cathy Seeley</td>
<td>Director of Programs, Mathematics</td>
<td>463-9585</td>
</tr>
<tr>
<td>Jim Collins</td>
<td>Director of Programs, Science</td>
<td>463-9585</td>
</tr>
<tr>
<td>Louis Grigar</td>
<td>Director of Programs, Social Studies</td>
<td>463-9556</td>
</tr>
<tr>
<td>June Kahler</td>
<td>Director of Programs, Library Services</td>
<td>463-9556</td>
</tr>
<tr>
<td>Marty Urand</td>
<td>Director of Programs, Physical Education</td>
<td>463-9556</td>
</tr>
<tr>
<td>Name</td>
<td>Title</td>
<td>Telephone</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Robert S. Patterson</td>
<td>Director, Vocational Education Programs</td>
<td>463-9446</td>
</tr>
<tr>
<td>Eleanor K. Mikulin</td>
<td>Director of Programs, Special Needs</td>
<td>463-9443</td>
</tr>
<tr>
<td>Jay L. Eudy</td>
<td>Director of Programs, Agricultural Science and Technology</td>
<td>463-9687</td>
</tr>
<tr>
<td>Berry W. Sullivan</td>
<td>Director of Programs, Marketing Education</td>
<td>463-9443</td>
</tr>
<tr>
<td>Barbara Terrell</td>
<td>Director of Programs, Health Occupations Education</td>
<td>463-9442</td>
</tr>
<tr>
<td>Judith A. Hetherly</td>
<td>Director of Programs, Vocational Home Economics Education</td>
<td>463-9454</td>
</tr>
<tr>
<td>James M. Cogdell</td>
<td>Director of Programs, Trade and Industrial Education</td>
<td>463-9688</td>
</tr>
<tr>
<td>Robert K. Gordon</td>
<td>Director of Programs, Vocational Office Education</td>
<td>463-9692</td>
</tr>
<tr>
<td>Neil E. Ballard</td>
<td>Director of Programs, Industrial Technology Education</td>
<td>463-9474</td>
</tr>
<tr>
<td>Sylvia Clark</td>
<td>Director of Programs, Vocational Guidance and Counseling</td>
<td>463-9443</td>
</tr>
</tbody>
</table>
Appendix C

References


Maley, D. (no date). *The integration of mathematics and science into technology education: A holistic approach to education.* Austin, TX: The University of Texas at Austin, Extension Instruction and Materials Center.


Naylor, M. (1986). *Granting academic credit for vocational education. Overview (ERIC Digest No. 57).* Columbus, OH: ERIC Clearinghouse on Adult, Career, and Vocational Education.

Naylor, M. (1988). *Improving basic skills of vocational education students (ERIC Digest No. 69).* Columbus, OH: ERIC Clearinghouse on Adult, Career, and Vocational Education.


Appendix D

Miscellaneous
3 arrested after bomb threat forces hotel guests into rain

By Tim Lott
American-Statesman Staff

Three men were arrested Thursday night after a bomb scare at the Austin Marriott At The Capitol forced some 500 guests in business suits and pajamas into a steady drizzle.

Several witnesses said one of the men yelled, "Tax man! IRS! I am Allah!" as police led him away. The "bomb" turned out to be a briefcase filled with paper, said Austin police Lt. David Parkinson. Parkinson did not release the names of the suspects, but said all the men were age 40 to 45 and listed Austin addresses.

Their motive was not known, Parkinson said.

Hal Ohlendorf and Joe Linsalata, buddies from Austin, were minding their own business in the bar, drinking ale and watching the professional basketball game between the San Antonio Spurs and the Houston Rockets.

"The Spurs were up by 10, I think, at halftime," Ohlendorf said. "Next thing you know, the fire alarm goes off and we clear the place. The bar was packed - looked like a couple of hundred people. Maybe because everyone was drinking alcohol, everyone was calm."

Meanwhile, guests milled around in the rain on barricaded E. 11th Street and on Red River Street, awaiting the bomb squad.

"The hotel security people were at the 11th Street door, and the fire trucks arrived a few minutes later. It was a little tense, but people were calm.

3 arrested in Marriott bomb scare

Continued from B1.

(one suspect) in the hallway," he said. "As they approached him, he held (a briefcase) up and declared he had a bomb."

Parkinson said the hotel security officers backed away from him and called police. The security officers talked with the man, and as he stepped away from the briefcase, they grabbed him, Parkinson said.

Several witnesses said they had seen that suspect enter the building at about 7:45 p.m. wearing a brown suit and vest, but no shirt.

"When the police brought him out, he was yelling, 'Tax man! IRS! I am Allah!" said guest Timothy Kelly, who was on a business trip from Castroville. Kelly and his business associates did not see the other suspects.

Parkinson said the other two were arrested running from the hotel as police arrived.

Meanwhile, guests milled around in the rain on barricaded 11th Street and on Red River Street, awaiting the bomb squad.

Just after 10 p.m. the disposal experts arrived, examined the briefcase and found it to be filled with paper, freeing everyone to return to their rooms - or the bar.

Hal and Joe took their same stools and ordered the same beer. But the game had ended.