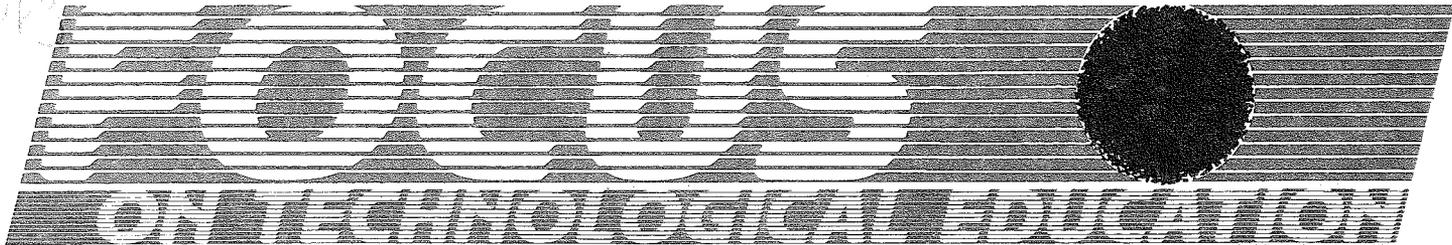


EDU 7/3/97 / 1/1
COPY



Vol. 1, No. 1

A Vocational Newsletter for Educators

Focus on Technological Education is a new publication initiated to communicate with the various publics involved in Vocational/Technological Education. Future issues will also feature articles from business and industry. Items to be shared, ideas, and comments are invited. Please share your feedback with Cathy Shadle, Marketing Education State Supervisor and editor of this publication.

Barbara Border
State Director
Vocational/Technological Education

LEGISLATIVE UPDATE

The enactment of HB 2124 and HB2680 have provided Arizona with the ability to expand our pilot model programs in vocational/technological education. The legislation has appropriated \$2 million for the following purposes:

- a. Expansion of Model Programs
- b. Teacher In-Service
- c. State Staff to do research as requested

Monies have been allocated to the first two areas.

The new law also brings a new structure for the State Board for Vocational/Technological Education, adding four business members, and structuring a funding subcommittee which the Board will control.

Business has pledged to tax itself if the legislature will match the amount so that vocational/technological programs in the state will be able to expand and move into the technological age.

FOCUS ON PILOT PROGRAMS

by Richard Condit
Deputy Associate Superintendent

Why Pilot Programs?

Nearly four years ago, over 150 interested business/industry, government and education leaders met to consider a new direction for Vocational Education in the state of Arizona. That meeting and those that followed resulted in the identification of seven "Critical Issues" which became the major topics driving the reform efforts of vocational education in our state. Those issues are:

- 1. At Risk Populations
- 2. Teacher/Training/Retraining/Certification and Curriculum
- 3. Instructional Models for Rural Impact
- 4. Economic Development
- 5. New Technologies
- 6. Academic/Vocational Education Integration
- 7. Guidance

Utilizing these critical issues and the specific recommendations regarding each, a new "Model" for the delivery of vocational education was designed. The model serves as the vehicle to translate the critical issues into educational programs which provide students with the skills necessary to compete successfully in the technological age.

During the past two years "Pilot" programs have been undertaken as a means of conducting research and development activities on the various components of the model.

TECHNOLOGY

Research Division
Department of Library, Archives and Public Records
STATE OF ARIZONA

Cross Junior High School in Tucson's Amphitheater District put in place a commercially available product called Lab 2000. The lab is made up of work stations each

MAR 20 1997

(continued)

Pilot Programs (continued)

having a computer as its central tool, where students team up to tackle topics like: flight simulation, computer-aided drafting, the history of technology, electronic and pneumatic circuitry, power transmission, word processing, hydroponic agriculture, construction, etc. Student interest in the program is high because what they are learning is consistent with the skills needed for occupations in the technological age. Students are having success with concepts many adults thought unattainable by students this age. Linda Loomis, Vocational Coordinator for the District, makes the following observations: *"Girls are more confident working with technology in this environment, students are learning more collaboration skills, the program is tapping all the students at the middle school and it is my opinion that the program is such that all students need to be exposed to its content. Students are beating down the walls to get into the program, and the teachers in other disciplines are integrating with the lab and its content."*

Two years ago in response to declining enrollment in the traditional industrial arts program and a general feeling that the needs of students were not being met, a new technology course was started at **Dysart Junior High School**. The teachers, with some help from a Department of Education grant, worked to design and have built student work stations for the technology lab. In addition, the teachers began the process of developing instructional modules addressing technology in the areas of manufacturing, communications, transportation and construction. Sandra Harmon, Principal at Dysart Junior High School, believes that even at this early stage that to some degree the following can be attributed to the program. *"The students are more technically literate, seem to possess better problem solving and decision making skills, have more exposure to the use and application of computers, seem to have enhanced their leadership skills, and finally the program may be contributing to improved performance at the science fair, the need for additional biology courses at the senior high and less remediation courses at the senior high."*

APPLIED ACADEMICS

Marana High School has implemented an applied physics program entitled Principles of Technology (PT). Results from the first semester of the implementation of this program were impressive. Students from three classes were compared, two in general science and one in PT. The three classes were made up of similar students, averaging 24 per class. Of the two general science classes, one had a failure rate of 25 percent and the other 30 percent the first semester. **The PT class had 0 percent failures.** First semester PT grades included 8 A's, 9 B's, 7 C's, and no D's or F's. All three classes were taught by the same instructor.

GUIDANCE

This past summer the first Arizona Counselors' Academy was held. The purpose of the academy was to develop a

team of educators in the schools responsible for the implementation of a new system of guidance entitled Competency Based Guidance (CBG). CBG ensures that all students in a school are provided with appropriate educational opportunities to prepare them for constructive participation in society, immediate employment and/or further education. Counselors, teachers, administrators, and members of the community team up to help students attain 12 specific guidance competencies prior to graduation from the 12th grade. The academy was attended by 106 counselors representing 51 schools. The response to the academy was terrific. 95 percent of the participants believe that their primary purpose for attending was met. The advantages of a CBG approach in the opinion of the participants include: results oriented, accountability, structure, benefits all students, comprehensive, team approach and a good public relations tool for the profession.

HIGH TECH

Casa Grande Union High School is in the first year of a pilot technology program. High Tech is a class that teaches young people to think and use the process of problem solving. Each student can explore the different areas offered: computers, robotics, computer-aided design, computer-aided manufacturing, electronics, hydraulics, pneumatics. A student working in robotics will build robots with Lego and program them with Logo. Students can use a robot that can do a pick and place. The program has a computer-aided manufacturing machine that can make parts the students design. The students are placed in a related math and English class at the same time they are in the High Tech course. Students do related reading, writing, and math skills as they relate to what they are doing in the High Tech class.

These examples are just a few of the many excellent pilot programs that have been implemented over the past two years. The new "Model" for Vocational/Technological Education can have a real impact on improving the competence of the entry level workforce in our state and can improve the academic performance of students while reducing the dropout rate.

Based upon the successful research and development activities of the Pilots, comprehensive model programs have been funded for the 1990-91 school year. These sites will pull together all of the experience of the past two years and seek to provide students with experiences in each of the curriculum strands that have been identified and are included at each level of the model.

A changing student population and the demands of employment in the Technological Age, where students must compete in a global market place, suggest now is the time to modify the vocational education delivery system to posture our students for economic success. Arizona is well on its way to achieving that goal.

VOCATIONAL/TECHNOLOGICAL INTERNSHIPS

An Intern's Perspective

by Jon Nieman

As vocational teachers, we have an enormous task staying current with the changing technology of today's business and industry. I was very fortunate this past summer to have the opportunity to acquire first-hand updating at the Intel Corporation in Chandler. In cooperation with the Arizona Department of Education, Intel provided me two weeks of intense training in the changes of today. I have to say—I was impressed.

During the two weeks, I was able to attend an International Sales Conference at The Pointe South Mountain in Phoenix; work with a product development team; and shadow various managers within the marketing department at Intel. Not only was I able to pick up information about changing technology, but, I also was able to talk with people from all over the world about the changing market place—an experience that would be impossible to get in any other way.

During the International Sales Conference I was able to see how the corporation worked with their sales force to update them on current technology and the new product availability. Even though most of the information was confidential, I was still able to take back to the classroom the concept of product knowledge and meeting the customers' needs.

The round table discussions I had with upper level management were twofold. They were just as interested in education as I was about Intel Corporation. The one point that was stressed over and over throughout my many discussions was the fact that we need to prepare our

students for an international market. The basic economic structure is changing and we need to be proactive instead of reactive or we are going to find difficulty in keeping up with the rest of the world economy. Students should be not only understanding the concepts of International Marketing, but also studying the background and cultures of each country.

The work that I did with Intel during my visit has helped me tremendously in the classroom. It keeps my curriculum current and helps me to provide interesting topics of discussion. It has also given me some contacts for advisory committees and guest speakers. I would highly recommend that anyone in a vocational program have the opportunity to experience this type of update.

Business and industry have taken an active role in helping Arizona vocational education improve the quality of our educational system. They have taken active parts in task force committees, advisory committees, vocational conferences, and teacher internships such as this one. I feel that this type of teamwork is essential and must continue. It is through this commitment that we will make Arizona education number one in quality.

Jon Nieman is a Marketing Teacher-Coordinator at McClintock High School. He is a graduate of Arizona State University. He currently serves on the Vocational/Technological Certification Task Force and the Program Standards Task Force.

THE ARIZONA VOCATIONAL/TECHNOLOGICAL EDUCATION MODEL

A Progress Report

by Dave Muehlbauer

Director, Program Improvement Unit

Education has been a topic of great public interest for the past several years. The recent changes in technology and in our economy, along with a strong perception by the public that the educational system was failing, has prompted a variety of actions by local school districts, and state and federal government. Arizona Vocational Education has been involved in a comprehensive program to update and revitalize vocational education programs. Through extensive involvement of vocational educators, business and industry, a series of critical issues were identified and a new Model for Vocational/Technological Education was developed. The model is based on four levels of instruction, serving students from grade seven through

postsecondary and adult programs. An illustration of the Arizona Vocational/Technological Education Model appears in this publication.

Since its dissemination in 1989, the Arizona Vocational/Technological Education Model has been the topic of numerous discussions among those interested in vocational education. Three key questions have been raised consistently. Obviously, there are a great many details and issues that will need to be answered as the Model is implemented. It is hoped that the answers provided will begin to clarify where we are now and where we intend to go with the Model.

(continued)

Model (continued)

1. What is the reason behind the Model—why change vocational education?

The reasons for designing the Model are many, but can be summarized in two broad categories:

- Students need to be prepared to enter a workforce which requires more sophisticated skills and a greater ability to adapt to changing job requirements.
- Too many students drop out of school, or graduate without the skills needed to obtain employment or enter a postsecondary program. These students are frequently referred to as “The Forgotten Half.”

Worker Competence

A variety of technological, societal and political changes have dramatically changed the world in which our businesses and industries must compete. One of the greatest challenges for American business and industry is to obtain workers who possess the sophisticated skills needed today and who can adapt to the rapid changes occurring. Therefore, if the educational system is to meet the needs of employers, students will need to have both current occupational skills at higher levels than we can currently provide and skills which enable them to quickly adapt to new job requirements. Fundamental to this type of training is a higher level of basic academic skills (math, science and communications) and the ability to apply those skills to realistic situations.

Vocational education has historically been very successful in helping students integrate academic skills with workplace skills. Unfortunately, many students choose not to participate in vocational education programs or enter a program late in their high school career. To provide for the higher levels of skill attainment and the required academic skills, students must begin their participation in Vocational/Technological Education at an earlier age and the experiences they have must provide students with a coherent program of instruction.

The Vocational/Technological Education Model provides an opportunity for students to participate in a coherent program of instruction through an articulated sequence of exploratory, core and occupational preparation courses or programs.

The Forgotten Half

Many schools across the country provide three “tracks,” the college-prep track, the vocational track and the general track. We have been fairly successful with both the college-prep and vocational tracks. We have been much less successful with the “general” track. A report

by the William T. Grant Commission on Work, Family and Citizenship summarizes this problem quite clearly:

“Educators have become so preoccupied with those who go on to college that they have lost sight of those who do not. And more and more of the noncollege-bound now fall between the cracks when they are in school, drop out, or graduate inadequately prepared for the requirements of society and the workplace.”

One clear characteristic of the educational program for the “college-bound” is that the sequence of courses is well planned and communicated to students. For students in the general or vocational track this is seldom the case. Students select courses on a year-to-year basis, with limited planning or guidance. Students who select a variety of unrelated courses fail to develop sufficient skill or proficiency in any one area. Without an appropriate level of proficiency, these students are generally unable to obtain a job that pays a living wage.

The Vocational/Technological Education Model is designed to serve a greater number of students and provide those students with an articulated program of instruction. In addition to assuring that students will obtain the skills required for entry level employment, the Model also provides support for those students whose occupational goals will require postsecondary education through community colleges, apprenticeship or other programs.

2. What will be the process for implementing the changes required for the Model?

In Arizona, the design of vocational education programs has always relied heavily upon input from business and industry as well as from teachers and other school personnel. This procedure will continue to be followed in the implementation of this Model.

Over the past two years, through funding provided by the Arizona Department of Education, many schools throughout the state have piloted various programs which support the Model. Some of these pilot activities have included Principles of Technology, Applied Math and Communications, Technology 2000, Computer Integrated Manufacturing, and several others. These pilot programs have provided valuable feedback on certain components of the Model. The results of these pilot activities will be included in the continued design activities for the implementation of the Model on a broader scale.

During the 1989-90 school year, a Steering Committee was formed to guide curriculum development and implementation for the Model. The committee included members from the Arizona Department of Education

(continued)

Model (continued)

staff, program specialists from the universities, local vocational teachers and administrators, and representatives of business and industry. This group met to review the Model concept. During this process, six "strands" were developed to organize" the concepts included in each level of the model. Those six strands are:

- *Thinking Skills*
- *Career Development Skills*
- *Applied Academic Skills*
- *Life Management Skills*
- *Business, Economic and Leadership Skills*
- *Technology Skills*

The committee has also identified an initial set of proposed outcomes for each level in the Model. These draft outcome statements were distributed at the 1990 Vocational Education Conference and will be further disseminated this year.

During the 1990-91 school year additional research and development work will be done for the Model. This work will include an updating of Arizona occupational data to assure that the courses or programs implemented will prepare students for occupations where there is a current and future employment demand. Occupational competencies for high-demand areas will be validated by industry and course and program sequences will be designed. The previously-established Steering Committee will continue to provide guidance throughout this process.

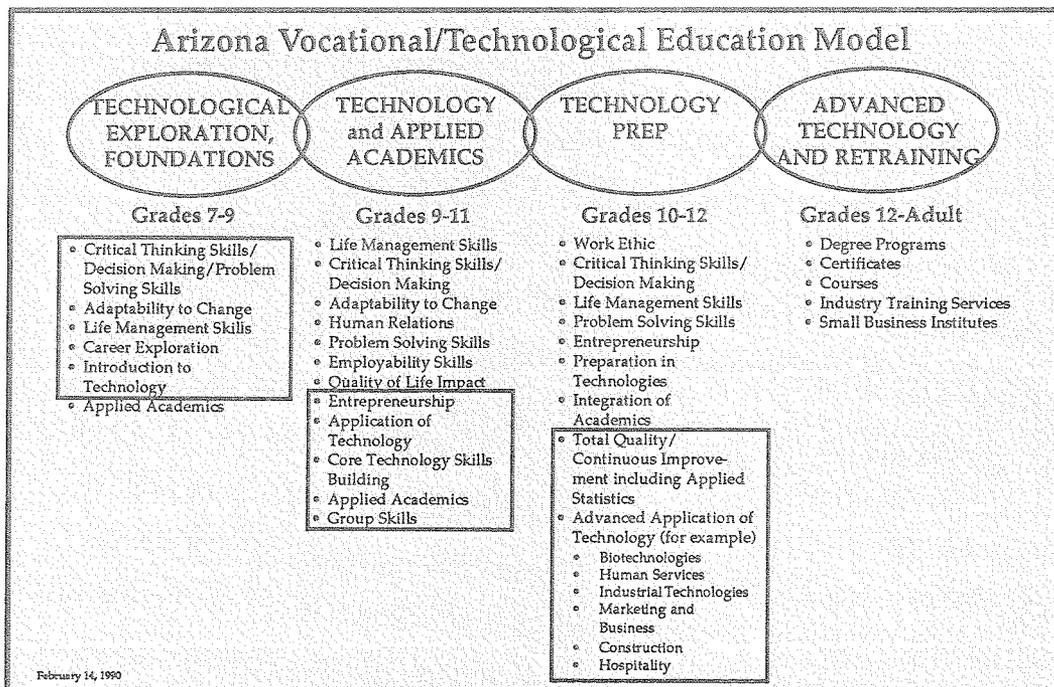
Also during the 1990-91 school year a number of "Model" programs are being funded by the Arizona Department of Education. These programs have been awarded grants to implement one or more levels of the Model. In addition to financial support, the Arizona Department of Education will be providing extensive technical assistance to these sites as they work to implement their programs.

Depending on funds available through state and federal sources, additional research and development, as well as expansion of "Model" programs is expected to continue in future years. It is likely that a full-scale implementation of the Model will require up to five years. This type of phased implementation will seek to assure that students who participate in a Level I (grade 7-8) program will have the opportunity to participate in appropriate Level II and III programs in a coherent sequence.

3. How will the implementation of the new model effect local vocational programs, teachers and students?

Obviously, the implementation of the Model will not take place overnight. The transition for local vocational programs will depend on a variety of local conditions as well as the financial resources available. It is anticipated that schools will implement the Model in phases, based on a locally developed plan. Implementation will frequently require the design and development of new learning laboratories and new course and program sequences.

(continued on Page 7)



VOCATIONAL/TECHNOLOGICAL CERTIFICATION TASK FORCE RECOMMENDATIONS

by Dr. Charles Losh
Deputy Associate Superintendent

In response to calls for improvement in the quality of individuals coming into the workforce and the need to enhance Arizona's ability to compete in an international market, the Superintendent appointed a Task Force (TF) to accomplish three objectives. The first objective included a review of existing Vocational Teacher Certification processes, the second, identification of areas of concern that existed relative to the existing process, and the third, to provide recommendations for improvement of the vocational certification process. Additionally, the TF was charged with determining recommendations that would bring improvements in the following areas:

- Student Achievement Scores
- The High School Dropout Rate
- The Work-readiness of High-School Graduates
- Arizona's Position in National/Global Competition
- Instructor Ability to Teach Course Work in Multiple Disciplines
- The Shortage of Certified Instructors in Selected Program Areas
- Definition of the Occupational Knowledge of a Qualified Instructor
- The Availability of Course Work Required for Certification
- Consistent Methods for Certifying Individuals Holding Other Than an Education Degree
- A Method of Verifying Competence of Recertification Candidates

Who is on the Task Force?

The Task Force membership includes representation from vocational instructors and administrators, business and industry, the State Council on Vocational Education, Arizona Department of Education certification and vocational units, and various professional groups. The initial meeting of the Task Force was in June of 1989, with meetings on a monthly basis until the initial draft recommendations were approved by the Task Force in March of 1990. The recommendations were shared with the State Board of Education on two occasions, and the Committee to the State Board of Vocational Education once in preparation for potential legislation.

What has the Task Force Recommended?

The primary recommendation of the Task Force is that a competency demonstration process be developed and implemented to verify an instructor's qualification for initial or renewal certification. The TF believes that

(a) training does not necessarily mean an individual has learned the skills and can competently demonstrate them, or teach them to students, (b) a teacher's ability to demonstrate knowledge is more important than how or where they obtained that knowledge.

What is Competency Demonstration?

The TF recommends a system whereby the term "demonstration" connotes more than one type of assessment process. For example, a combination of observation by peers and administrators, written assessments, portfolios, student achievements and student assessments could be used as part of the "competency demonstration." In the proposed system, competency demonstration processes would be identified, and appropriate tests would be developed or purchased to be used to determine an instructor's knowledge level in (a) the subject matter to be taught; (b) basic academic skills (this may be the presently used Arizona Teacher Proficiency Exam); (c) the academic skills related to the subject matter; and (d) the knowledge related to classroom/laboratory management, student learning styles and delivery of competency based (CBVE) programs. Certification in trade and technical areas would continue to require recent business-industry experience directly related to the content of the certification.

What Types of Certification are Being Recommended?

As presently conceived, there would be two levels of certification, an initial (Provisional) certificate that must be renewed annually for up to three years. This is the certificate that a beginning teacher or an out-of-state teacher would initially receive. The second level of certificate is the "Regular" certificate, designed to replace the present "Basic" certificate. The Regular certificate would be good for three years, and in addition to the requirements for the Provisional certificate, 80 hours of industry-current on-the-job experience in the business/industry related to the certification would be required. The Regular would also require "LEA approval..." to possibly include so-called "portfolios" that demonstrated successful performance as an instructor. The three year renewal cycle for the "Regular" is suggested to help provide assurances that instructors "keep up with" technology, thereby helping to assure that students receive instruction that relates to current technology.

An additional area of certification would be for a presently employed individual identified as an "expert" in a topically critical content area to come into the classroom on less than a full time basis. This certification would be limited to annual renewal, and among other requirements, calls for employer and LEA approval. This certification is in response to business/industry concerns that although an individual is well qualified both academically and experientially, he

(continued)

Certification (continued)

or she cannot teach in a secondary classroom. An example is that a person with an Electrical Engineering degree presently cannot teach a Basic Electricity course, and a Physics Nobel Laureate cannot teach a physics class.

The final recommendation is for the establishment of a "Related Academic Skills Endorsement." This endorsement would qualify students (in a vocational program

wherein the academic content is appropriate and the instructor holds the endorsement) to receive academic credit for high school graduation.

Statewide meetings are being held this fall to provide further opportunities for input to the proposed system, prior to bringing to the State Board for final review. If you have questions or concerns about the proposed process, please plan to attend a regional meeting or send your concerns to Dr. Charles Losh.

Model (continued from Page 5)

Key to the successful implementation of the Model in Arizona is the involvement of those currently involved in vocational education. The curriculum development process will actively involve current vocational teachers in writing, reviewing and pilot testing. As components of the Model are implemented it is expected that extensive in-service training will be provided to teachers. This in-service will include the new occupational and technical concepts, and also new strategies for delivering instruction.

Finally, but most importantly, students will have the opportunity to participate in an updated vocational/technological education program that:

- *better meets their needs and interests*
- *provides a more coherent program of instruction*

- *provides better application of basic academic skills*
- *develops higher levels of skill in specific occupational clusters*
- *provides greater opportunities for employment and/or advanced education or training*

Change is a difficult process. However, our failure to adapt to the changes that occur around us is simply not an option. The future of our state, our nation, and our students requires that we develop a program that recognizes and adapts to the changing world. This is not a task we undertake lightly, but one we must share and work collectively to address.

For more information on the Vocational/Technological Education Model, contact David Muehlbauer, Arizona Department of Education, 542-5352.

CALENDAR

November 29-December 2	American Vocational Association Conference, Cincinnati, Ohio
January 3	Livestock Judging Contest and Tractor Rodeo – ANLS, Phoenix
January 9	Northern Area DECA Winter Conference, Mesa Community College
January 16	FHA Executive Council and Advisory Board Meeting, ADE
January 19	AVATA Board Meeting, Peoria High School State FFA Advisory Board Meeting, Phoenix
January 23	Arizona Business Education Advisory Council Meeting, ADE
January 23-24	Central Area DECA Winter Conference, Yuma Community Center
January 31	Midyear Business Education Meeting, Phoenix

Printed in Phoenix, Arizona by the
Arizona Department of Education
Total Copies Printed 5500
Total Printing Cost \$1650.00
Unit Printing Cost \$.30
Date of Printing 12/90

Vocational/Technological Education
Arizona Department of Education
1535 West Jefferson
Phoenix, AZ 85007

