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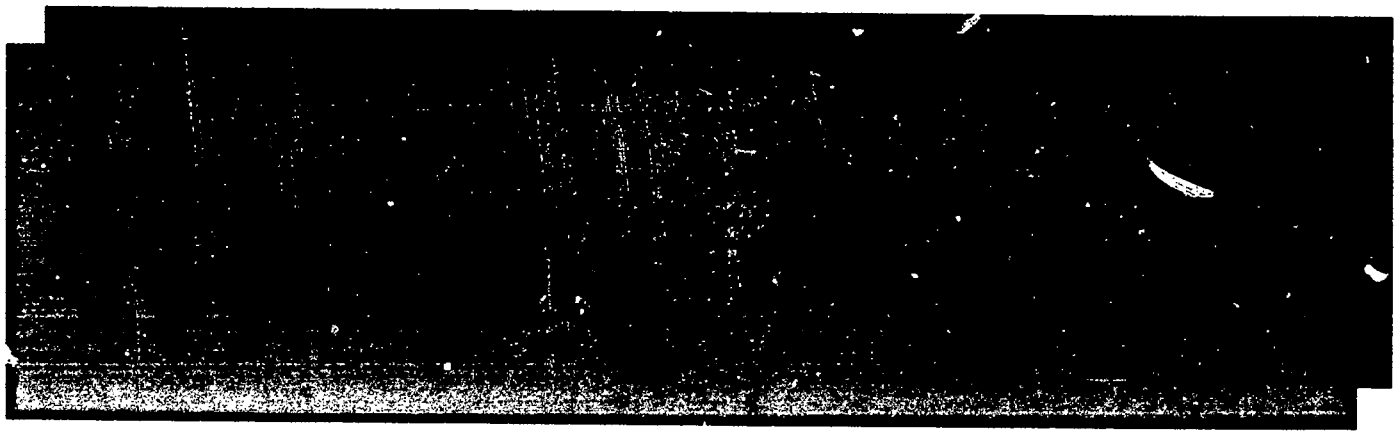
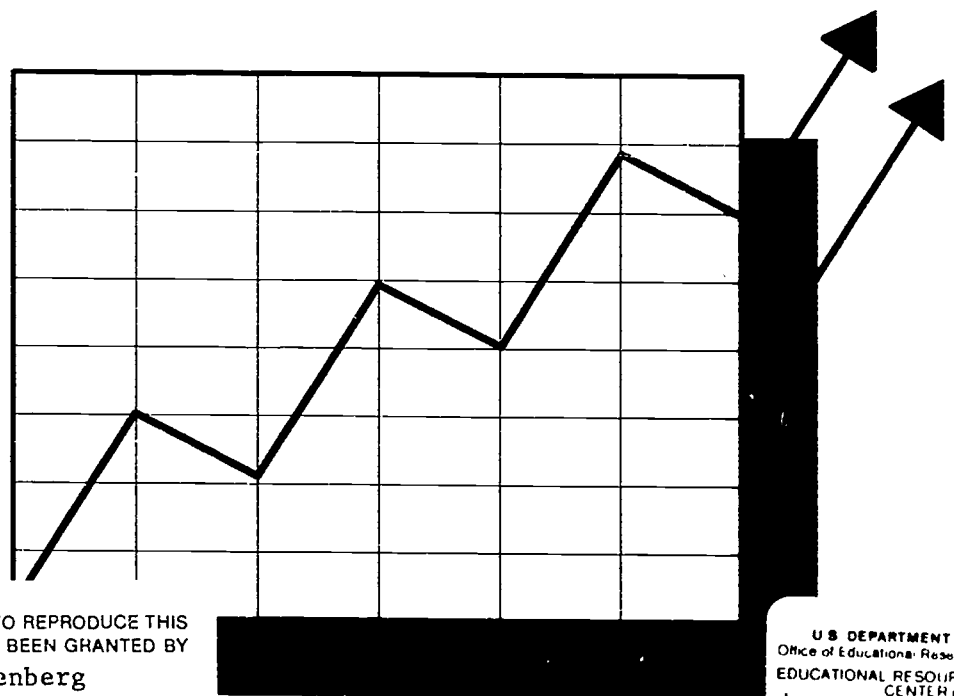
ABSTRACT

Developed to assist community college administrators and faculty in enhancing vocational educational programs and services, this Vocational Education Resource Package profiles four vocational education programs at California community colleges that show promise in serving special population students. First, the Applied Mathematics for Electronics course (ET 320) at San Jose City College (SJCC) is described. The course was designed for students whose math skills are insufficient for success in SJCC's electronics program. Since all electronics courses at SJCC require written reports, ET 320 includes a computer-based vocabulary tutorial on specific electronics terminology. Next, the Occupational Readiness Program at Bakersfield College is described. Students enrolled in the program receive technical lab training in automotive maintenance or welding, while simultaneously learning basic literacy, communication, mathematics, and job survival skills. The basic skills course is taught by a vocational instructor so that basic skills are directly integrated into the technical areas. Next, the booklet describes San Joaquin Delta College's Communication Skills Division--Basic Skills Program. The main teaching method used in courses entails the diagnoses of students' individual remediation needs and learning style and the prescription of appropriate lessons and learning approaches. An external program evaluation revealed significant gains in students' basic skills, retention rates, and feelings of success. Finally, Los Angeles Trade Technical College's (LATTC's) Model for Tech Prep/Articulation is described, emphasizing such key elements as the development of a portfolio of achievement to track student progress through each step or articulation. LATTC has articulated printing, automotive mechanics, electronics, construction technology, and drafting programs with selected high schools and has been working with four-year colleges to facilitate transfer. (AC)



VOCATIONAL EDUCATION RESOURCE PACKET



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VOCATIONAL EDUCATION RESOURCE PACKAGE

Promising Practices

Prepared for the
Chancellor's Office of the
California Community Colleges

Prepared by the
Evaluation and Training Institute
12300 Wilshire Boulevard, Suite 420
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1993

VOCATIONAL EDUCATION RESOURCE PACKAGES (VERPs)

Vocational Education Resource Packages (VERPs) are made available to the California Community Colleges through a special project grant. VERPs are designed to assist community college administrators and faculty in enhancing vocational education programs and services, especially those serving special population students.

Each VERP contains information about successful program strategies and ideas currently in use in vocational education programs at the California Community Colleges. VERPs enable the dissemination of various program approaches to interested colleges, and provide resource materials to improve or develop programs which respond to local needs.

The VERPs are organized along thematic lines based on the needs of California Community Colleges. This VERP provides information on promising practices in vocational education.

VERP Titles	
Industry-Education Partnerships	Partnerships with the Public Sector
School-to-Work Transitions	Multi-media Instruction
Trends in Gender Equity	Promising Practices
Career Development	Staff Development
Rural Programs	Grant Writing

TECHNICAL ASSISTANCE

The special project grant that enabled the development and dissemination of the VERPs also provided for technical assistance. **Technical assistance services and workshops are available free of charge through June 1993.** The workshops and technical assistance will be provided by community college faculty and other resource people with relevant experience and know-how to share. Should your college wish to have an on-site workshop, or should you desire additional information, please contact:

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BACKGROUND

This Vocational Education Resource Package (VERP) presents profiles of vocational education programs which show promise or innovation in serving special population students. ETI devised this VERP to be a showcase for those outstanding programs that could not be easily categorized within the themes covered by the other VERPs. These programs include:

- Applied Mathematics for Electronics, San Jose City College.
- Occupational Readiness Program, Bakersfield College.
- Communication Skills Division - Basic Skills Program, San Joaquin Delta College.
- Model for Tech-Prep/Articulation, Los Angeles Trade Technical College.

Applied Mathematics for Electronics San Jose City College

The key elements of the program include:

- Qualified and committed person to lead the effort;
- Administrative buy-in and agreement among instructors that an applied math course for electronic students is necessary; and
- Specialized instructional materials.

Program Background

San Jose City College (SJCC) offers a course to serve the needs of students whose math skills are insufficient for success in Electronics 121, the first in SJCC's series of electronics math courses. This course is known as Electronics 320, Applied Math for Electronics.

Prior to the development of Electronics 320, students with math skills deficits enrolled in the college's general remedial math course. There was a gap, however, between the ending point of the remedial math course and the starting point of Electronics 121. To bridge this gap, Ms. Barbara Snyder, a SJCC electronics math instructor, developed Electronics 320.

The main barrier encountered in the development of ET 320 was resistance from those who did not perceive the need for the course and continued to encourage most students to directly enroll in the first semester of electronics math, instead of pointing out ET 320 as an option. The electronics department simply reacted to whatever hurdles they met because the course was so strongly needed. The course is especially helpful for re-entry students who have not used their math skills for a long time, and for ESL students.

Program Description

Electronics 320 focuses on the skills students need to know as an electronics student and/or technician, using an applied math approach to convey the subject matter. Students are required to understand and apply a number of mathematical concepts, solve problems, and be able to explain how they were solved. Actual electronics problems have been used throughout.

Students are made aware of this course in two ways. Some students are identified through the matriculation process: those who identify their intent to major in electronics and who score below the cutoff on the math placement test are advised to enroll in both the general remedial math course and Electronics 320. For these students, ET 320 is a pre-requisite to the more demanding electronics math courses. While counselors are supposed to tell "eligible" students about ET 320 when they go through matriculation, sometimes the counselors encourage students to immediately enroll in courses for their major. Students who find the first electronics math class a struggle are identified by the instructor and encouraged to take Electronics 320. For these students, ET 320 is an adjunct to the first semester electronics math course.

Students who complete ET 320 earn 2 units of general education credit towards their AA or certificate. These units are not counted towards the major, however.

Initially, Electronics 320 emphasized math skills. However, all electronics courses require both oral and written reports, so vocabulary skills are important to successful entry into the electronics field. In 1990-91 a computer vocabulary tutorial program called WORDVIEW was developed. WORDVIEW includes all vocabulary used in the core electronics curriculum to meet the communications needs of students.

The purpose of the WORDVIEW program is to provide a non-threatening way for self-drill on specific electronics vocabulary. Technical students can use the WORDVIEW diskettes whenever they have free time and access to a computer. Sentences use technical words in correct context, and the user fills in the blanks from the words at the top of the screen. Sets can be tried repeatedly, until the user has mastered the words and concepts. WORDVIEW keeps track of progress, and the user can benefit from both short and long periods at the computer.

WORDVIEW, the vocabulary tutor for technical students, is available for use on IBM-compatible personal computers.

Occupational Readiness Program
Bakersfield College

The key elements of the program include:

- Administrative support and a dedicated staff;
- Advisory council input concerning the needs of employers; and
- Close monitoring of student progress to identify and correct weak areas.

Program Background

Bakersfield College has established a working relationship with the local private industry council known as the Employers' Training Resource (ETR), and since 1982 has offered vocational training as part of the ETRs Job Training Partnership Act program. Unlike other cooperative JTPA funded programs, Bakersfield College instructors have worked to develop a specialized program that provides occupational preparation and basic skill remediation in addition to technical instruction. Funded solely through JTPA funds, the program is staffed by Bakersfield College faculty and operates from a center located within the Applied Science and Technology Division.

ETR and its designated Industry Advisory Council formulated a curriculum that would teach participants the personal attributes and job skills that employers desire in their employees. The curriculum was designed so that students learn a specific skill in automotive maintenance and repair, welding, or farm/tractor mechanics; they also learn basic math and communication skills, as well as self-esteem and motivation. Although the entire program is a model for providing technical and academic skills to underprepared students, of particular interest to this study is the Occupational Readiness component of the program.

Working collaboratively with ETR staff, the project staff identified the needs of industry employers. In an effort to develop well-rounded individuals to meet those needs, they designed a curriculum to adequately prepare students for personal and professional success. The following components of instruction comprise the curriculum:

- Technical expertise related to students' skill area;
- Writing skills and reinforcement;
- Basic math skills;
- Survival skills and job preparation skills; and
- Confidence, self esteem and motivation reinforcement

Program Description

The program operates as a "college within a college". Students receive 450 hours of technical lab training through either the Automotive Maintenance and Repair course or the General Welding course, both of which introductory skills courses. Students are concurrently enrolled in the Occupational Readiness course for 180 additional hours of personal development and job skills related classroom instruction. Progress is monitored on a daily basis. Upon completion, the students possess job skills that enable them to secure employment within their chosen area.

The Occupational Readiness course combines basic literacy, communication, and math skills, with job survival skills. The course is taught by a vocational instructor so that the basic skills are directly integrated into the technical areas. The classes are taught in the traditional lecture and test format. Weak students are paired with strong students so that the success of every student is ensured. The students also develop important interpersonal skills this way.

Occupational Readiness can be broken down into three components: Literacy/Communication, Math, and Survival Skills. The Literacy/Communication component places emphasis on reading/instructions comprehension and written expression by testing students with questions that require a written response, as opposed to true/false responses. The students also complete technical vocabulary exercises that have been compiled from the textbook readings. Speaking and listening skills are developed by on-the-job role playing that involves speaking and listening exercises.

The Math component develops the computational skills necessary to function on the job. The textbooks focus on practical problems in

specific technical areas that require math solutions. Basic math concepts, such as fractions, percentages, and measurement, are taught through practical vocational applications and exercises. Students are tested weekly with math competencies developed by the advisory council.

The Survival Skills component focuses on job preparation, self-esteem and motivation. Using an "environmental" approach, this component uses exercises, assessment tools, and videos which emphasize confidence and self-esteem. Job preparation includes drafting resumes and identifying the needs and desires that students want from a job. Interpersonal communication skills are emphasized by participation in team exercises. Students develop motivation by actively seeking certification through the competency tests.

The program is only offered to JTPA participants and eligibility is determined through an initial assessment by the JTPA/ETR staff. Basic proficiency must already be achieved by the students; the reading level of those accepted varies from the fifth to twelfth grade levels once accepted. The students attend an orientation that specifically outlines the policies and requirements of the program, and also the controlled environment which the students will enter.

The program is highly structured and the students are monitored closely. The attendance policy is like that of a job; students are required to attend all classes and be on time. Unexcused absences or excessive tardiness results in probation. The program provides not only specific job skills, but knowledge of how to obtain employment and be successful on the job.

In addition to the competency tests administered within the classroom or lab setting, the instructor evaluates the students on a monthly basis with the instructors' own competency tests. This includes a formal one-on-one evaluation. Upon completion of the program, students receive 12 units of non-transferable credit and a JTPA certificate. ETR arranges for job interviews and the students are monitored until employment is achieved.

This program is constantly reviewed and updated to meet the changing needs of both students and industry. Effective communication is necessary to this process. By monitoring student progress closely through competencies and tests, weak areas can be identified and

corrected. The Industry Advisory Council provides valuable input for the needs of potential employers. They meet once or twice annually to review the changing needs of industry. Administrative support for the program was gained through the successful results of the program. The Vocational Faculty coordinate the efforts of all areas. The cost per student placement is $3,000 to $4000, this includes a technical training component.

According to the college staff, there is a marked change in student appearance, motivation, and self-esteem by the end of the program. The program serves 100-120 students per year with a 25-30% rate of attrition. The classes and labs have a 90% attendance rate. The placement rate for students who finish the program is high: 71%-75% for the welding program, and over 65% for those who complete the automotive training.

Communication Skills Division -- Basic Skills Program San Joaquin Delta College

The key elements of the program include:

- Involvement of key administrators in planning to ensure common, clearly defined goals;
- Institutionalization of the program to ensure funding;
- Identification of personnel to help students understand what the program can offer and motivate students through building self-esteem and goal setting; and
- Use of tracking and follow-up studies to show effectiveness and make improvements.

Program Background

San Joaquin Delta College has been committed to serving the basic skills needs of its students for more than a decade. The basic skills program, entitled "Developmental Education" was directed by the Dean of Vocational Education and offered within the Vocational Education Division until 1984. Basic skills was then consolidated under the Communication skills Division. The link with vocational education was continued by including vocational administrators and instructors on the basic skills committee which discussed funding issues, curriculum changes, and program changes.

The college's articulated objective for integrating basic skills into vocational education is:

> *"Preparing students to be successful in all vocational areas, and subsequently, in life."*

At San Joaquin Delta college, basic skills courses are considered "mainstream," rather than separate from academic or vocational education. Basic Skills courses serve as the bridge between the college's academic and vocational divisions. Approximately 75 percent of the 2500 basic skills students per year are concurrently enrolled in vocational programs, which creates a natural link between the Communication Skills Division and vocational education.

Program Description

The Communication Skills Division at Delta College oversees 10 departments, including seven basic skills departments (Academic Assessment, Applied Basic Mathematics, Basic Writing Skills, College-Wide Tutorial, English as a Second Language, Learning Disabilities, and Reading Study Skills/Memory and Thinking Skills). Students assessed as having basic skills needs (level one or two on the college-wide assessment test) are advised to enroll in courses offered by the appropriate department. The math, writing, and reading labs are open entry and give remedial training with a vocational and life-skills emphasis. For example, a student in basic math and nursing may compute the number of ounces in a pint of blood, thus learning vocationally emphasized math. Reading and writing students may practice on bank statements or job applications.

The main teaching method used in the basic skills courses is called a "prescription". The instructor individually diagnoses the students' specific remediation needs and then prescribes the appropriate lessons based on a variety of materials reflecting alternative learning approaches specific to each student's individual learning style. Under this system, the instructors can effectively remediate students and prepare them for vocational programs.

Program Evaluation

San Joaquin Delta College evaluated its basic skills program in 1985 with an outside evaluator. The evaluation found significant gains in skills growth for basic skills students. Students in basic skills had a 97 percent retention rate compared to the college rate of 89 percent. The study also found that after taking basic skills courses students feelings of self-success were dramatically higher.

In 1990, the basic skills programs in reading, writing, and English as a Second Language were evaluated for 1987, 1988, and 1989. The evaluation found significant gains in reading, writing and language acquisition for basic skills students.

The retention rate in all programs was greater than the college-wide average retention rate. Moreover, student persistence in all programs was higher than the college-wide average. Students were also successful in college level courses for which they were concurrently enrolled. The groundwork for further evaluations of the program was established with this initial study, and the Communication Skills Division plans to evaluate its program every semester, producing reports for the college every third year.

The college has four recommendations for other community colleges wanting to replicate the program:

- Involve key administrators in the planning to ensure common, clearly defined goals;

- Institutionalize the program to ensure funding;

- Identify personnel to be "enablers" to help students understand what the program can offer and motivate students through building self-esteem and goal settings. Assign only volunteers or new faculty and staff specifically chosen for program assignments; and

- Use tracking and follow-up studies to show effectiveness and make improvements.

Model for Tech-Prep/Articulation Los Angeles Trade-Technical College

The key elements of the program include:

- Development of a "Portfolio of Achievement" to track student progress through each step of articulation.
- Reinforcement of articulation agreements with high school support activities such as, career days, college visits, donations to high schools, etc.
- Active involvement in grant-driven consortium of industry and publicly funded grants, (JTPA/PIC, VATEA demonstration projects, etc.)

Program Background

Los Angeles Trade-Technical College (LATTC) began articulation activities before the national movement for tech-prep gained momentum. The Dean of Academic Affairs at LATTC was inspired to develop the articulation model after visiting a high school classroom in which a fashion instructor had developed an academy-like program with a classroom that resembled a merchandising outlet and numerous extra-curricular activities. The success of the high school program prompted the LATTC dean to develop a system in which students could receive college credit for their high school and industry work. Articulation agreements were signed with that high school in the late 1980s. Those agreements evolved into a federal grant to extend the articulation model used in the fashion program to other disciplines.

In a parallel effort, LATTC had been working with four year universities to establish transfer programs in fashion to allow LATTC students to enter a baccalaureate program as a junior and receive advanced training. A formal articulation agreement was established with California State University, Los Angeles (CSULA). The partners were awarded a two year grant which allowed them to publicize the model and inform students and other educators about the articulation process. LATTC is active in many grant driven consortium of industry and publicly funded grants (JTPA/PIC, ETP, VATEA demonstration project etc) in order to deliver vocational education to specific populations. The LATTC program

is distinguished by its aggressive pursuit of grant money to export its ideas to other institutions, as well as its ability to expand articulation to fit the needs of its recruiting base.

Program Description

An essential element of the program is the Portfolio of Achievement, a notebook which tracks student progress, course work and competencies, and the degrees and promotions of students who start the matriculation process in high school or the community college. Students complete a personal assessment at each step and carry this information to the next institution so counselors are informed of student accomplishments. This document has proven to be very important. At the Tech-Prep Institute workshop Conference during the Summer of 1992, colleges just beginning the articulation process agreed that some sort of student portfolio should be a vital component of their programs, but they were at a loss for a model to follow. LATTC offered its portfolio as a model to be disseminated and replicated in other states.

A federal grant was awarded to extend the articulation model developed in the fashion program to other disciplines. East San Gabriel Valley ROP was selected as a demonstration site for the federal grant. To date, LATTC has articulated the following programs:

- Printing (Charter Oaks High School and the ROP);
- Automotive Mechanics (Baldwin Park High School, Gladstone High School and the ROP);
- Electronics (South Hills High School and the ROP);
- Construction Technology (Sunflower Center and the ROP); and
- Drafting Room Assistant (Charter Oaks High School and the ROP).

LATTC is stepping into a new area with its East San Gabriel Valley ROP demonstration site by having ESGVROP sit in on the development process for new programs being offered. Thus they are pre-articulated and have the benefit of the LATTC start-up investigation and industry

contacts, while the college has ESGVROP knowledge on career paths of high school students.

LATTC also has assumed a leadership position in articulating with the Los Angeles Unified School District and is currently working with the following high schools to develop articulation agreements: Crenshaw, Venice, Belmont, Garfield, Jefferson, Manual Arts, Los Angeles, and Fremont. The college is also trying to develop agreements with The Fashion Magnet and Abraham Friedman Occupational Center, and Maxine Waters Preparation Center. LATTC articulates with surrounding entities such as Compton Unified, Tri Cities ROP, Lynwood Unified, El Monte Unified and Mark Kepple High School.

The college backs up articulation agreements with intense high school support activities including career days, Presidential luncheons for high school principals, college visits, pre-testing on high school campuses, donations to high schools, specialized programs to assist in remediation for students who are deficient in communication and computation skills, personal assessment, high school faculty nights, and scholarships. In many cases, LATTC has had to educate the high schools on what articulation means and assist them with course evaluation.

On the university side, LATTC continues to develop upward articulation agreements with Cal State L.A. in the Technical Education Department for areas such as Refrigeration/Air Conditioning, Manufacturing, Electronics, and Printing. A high school that articulates in one of these areas automatically becomes part of a 2+2+2 agreement.

LATTC's next step is to find funding to try what Dean Tate calls a revolutionary approach to articulation, one she refers to as "Reverse Articulation." Reverse Articulation involves taking the first semester technical course work offered at LATTC and breaking it down to be delivered in a two year time sequence at a high school. Using this method, articulation would be built in to all programs developed. She also hopes to develop integrated academic skills, teaching videos and lectures based on the college's professional programs.

LATTC tries to remain on the cutting edge of integrating academics into vocational subjects to create relevant education to prepare students for work. The college continues to look for funding opportunities which will allow it to export some of its sophisticated models and provide education to a variety of institutions and special population students

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