

**Exemplary Worksite Learning  
Programs: Preparing Students  
for the 21st Century**

As workforce expectations change, so must teaching methodologies. The purpose of this report is to highlight exemplary educational programs that have taken important strides in preparing students to meet the occupational challenges that await them. Although much of the information provided here is specific to the programs described, many of the problems encountered—and solved—by the programs' administrators and staffs would be encountered in any worksite learning program. Thus, the report should provide useful guidelines in the planning and implementation of virtually any new program.

Kippy Cooper is a research associate at the Center for Occupational Research and Development (CORD).

Amy Souders is a member of the CORD editorial staff.

Teresa Rollins, program associate at CORD and editor of *Connections*, the monthly newsletter of the National Tech Prep Network, also contributed time and expertise.

The following representatives of the featured programs generously contributed to the writing and editing of this report:

Bernadine Hoston, BCTC  
Cheryl Hanson, WWTC  
Suzanne Tesinsky, Siemens/SCC/SCPS  
Werner Franz, Siemens/SCC/SCPS

Special thanks also to the following:

Ken Baker, Siemens/SCC/SCPS  
Edward Chin, Siemens/SCC/SCPS  
Betty Hogle, Siemens/SCC/SCPS  
Angela Kershenbach, Siemens/SCC/SCPS  
Pam Pelaez, Siemens/SCC/SCPS

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## ***Introduction— Today’s Students and the Workplace of Tomorrow***

The academic and professional needs of today’s students are changing. Educators are finding that students take more interest in education when they are actively involved in the process, when they are applying concepts learned in the classroom at the worksite, and when they are able to find employment because of these experiences. Parents are slowly shifting from the old view that four years of college is a must to the reality that students who get an education with an emphasis on hands-on learning can experience success by completing two years at a community college. Employers are saying they need students with more knowledge in mathematics and science, with the confidence to apply the knowledge learned at school in the workplace, and with the drive and motivation to acquire workplace skills and learn how to apply them at an early age.

Numerous magazine articles, news stories, and books are speaking to the ways employment demands of the twenty-first century are changing the concepts taught in today’s classroom. As technology becomes more advanced, so do the jobs of the future. As traditional jobs become less common and are replaced by jobs that require more training and sophistication, today’s average skilled employee is falling behind. Employers are spending more and more money on retooling because the technological demands of consumers are rapidly growing. Employers also need employees who possess “soft” skills, or employability skills, as defined by the Secretary’s Commission on Achieving

Necessary Skills (SCANS)—the ability to communicate effectively (orally and in writing), to work well with others on different types of projects, and to manage time.

Interest has been on the rise concerning the effectiveness of schooling with regard to job preparation, especially since publications such as *Goals 2000, America's Choice: High Skills or Low Wages*<sup>1</sup> and *What Work Requires of Schools: A SCANS Report for America 2000*<sup>2</sup> have emphasized how the educational system must change to better prepare students for the future. As a result, educators, parents, students, and employers are beginning to see the importance of implementing new ideas in education. For example, in its initial report, *What Work Requires of Schools*, SCANS stated that a high-performance workplace requires workers who have a solid foundation in basic literacy and computational skills, in the thinking skills necessary to put knowledge to work, and in the personal qualities that make workers dedicated and trustworthy. Thus, changes are taking place in the educational system that help students acquire the skills they will need to succeed in the workplace.

***E***mployers are looking for employees who can communicate effectively, work well with others, work on different types of projects, and manage time.

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<sup>1</sup> Commission on the Skills of the American Workforce, 1990.

<sup>2</sup> Secretary's Commission on Achieving Necessary Skills, 1991.

So, as workforce demands continue to change, who will be part of the workforce and where will they be working in the year 2000 and beyond? To answer this question, one must consider what occupations will need to be enhanced if the United States is to remain competitive in the world market and what skills will be needed by future employees. The Bureau of Labor Statistics projects in the *Occupational Outlook Handbook* that between the years 1994 and 2000 the fields of health care, computer technology, and electric and electronic technology will be among the fastest growing occupations. Students who get a solid foundation in these and other advancing occupational areas early on will have a better chance of success in their work.

As workforce expectations change, so must teaching methodologies (e.g., Tech Prep/School-to-Work). This report provides information on three successful programs in which students learn by participating in hands-on classroom activities and by taking part in worksite experiences. Graduates of the programs acquire the skills they need to enter the workforce or to continue their education at the postsecondary level.

The three featured programs are Exemplary Worksite Learning Award (EWSLA)<sup>3</sup> winners. The EWSLA was established by the Center for Occupational Research and Development (CORD) and the National Tech Prep Network in 1994 to encourage Tech Prep/School-to-Work consortia to integrate meaningful worksite experiences into their cur-

## **Exemplary Worksite Learning Award Winners**

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<sup>3</sup>In 1997, Caterpillar Inc. began to provide funding for the EWSLA, which included the cash awards, plaques, and administration of the awards.

ricula. Recipients of this award must meet criteria determined by a national committee of academic and business representatives in four major areas: 1) program overview: encompasses curriculum-based activities, assessment methods, and documentation of time spent at the worksite by students; 2) professional development and experiences; 3) business involvement; and 4) results: must include measurable student improvement rates such as grades and retention as well as measurable benefits to business partners and the community.

***These award-winning partnerships demonstrate the types of opportunities that can be made available to students through a business/education collaboration.***

The three EWSLA winners from 1995 and 1996 featured in this report are the Breithaupt Career and Technical Center (Michigan), the Seminole Consortium (Florida), and the Western Wisconsin School-to-Work Consortium (Wisconsin). Following is a brief description of each winner. Detailed information follows the introduction.

- The Breithaupt Career and Technical Center in Detroit, Michigan, collaborated with the Detroit Public Schools system and local industries to combine academics and career education for students from ten public schools in the Detroit area. The center acts as a liaison between high schools and postsecondary institutions. Students complete vocational classes, such as automotive concepts, computer design, and food service, at Breithaupt while earning high school and college credit.

- Siemens Stromberg-Carlson partnered with Seminole County Public Schools and Seminole Community College to better prepare students for a future in the telecommunication industry. In early 1990, Siemens was finding it harder and harder to locate qualified technicians. Therefore, it joined forces with education. Today, the resulting program flourishes. Its participants take a keen interest in their education, and many of its graduates articulate to the postsecondary level.
- In 1991, Wisconsin Act 39, the Wisconsin School-to-Work Initiative, was passed with the purpose of creating a more skilled and educated workforce. In 1993, the Western Wisconsin School-to-Work Consortium was formed. The impetus for the implementation of the School-to-Work initiative was a lack of qualified, well-trained employees in the printing industry. To remedy the problem, a pilot printing program was established. The success of the pilot piqued the interest of financial institutions and led eventually to the formation of the consortium.

**Note:**

The “Think About” section on page 59 is intended to trigger questions that should be considered prior to starting a program. Take time to review these sections and think about how your school/consortium can implement new Tech Prep/School-to-Work activities. The Appendix includes a glossary of the specialized terms used in this report and a list of web sites that can be used in researching or answering general questions about concepts related to Tech Prep and School-to-Work.

## **Breithaupt Career and Technical Center**

In the 1983 *A Nation at Risk* report, the federal government expressed concern about the growing “at-risk” population throughout the United States, especially in inner-city public schools. The report went on to say that these public schools needed to find a way to help students who were not college bound by giving them the opportunity to acquire marketable skills. One of the school systems identified as at-risk was the Detroit Public Schools system (DPS). Concerned, the DPS began to examine national skill standards and take a closer look at vocational programs. At the 1989 Charlottesville Education Summit, President George Bush developed the National Education Goals (which later became Goals 2000). In Michigan, these goals helped initiate the passing in 1990 of Public Act 25, which outlines improvement plans for Michigan public schools. *A Nation at Risk* and the 1989 education summit continued to heighten the Michigan state government’s awareness of the state’s increasing at-risk population and the dire need for educational reform. The same year, the federal government allocated money to schools interested in developing Tech Prep programs. Michigan received some of the money and began distributing it to community colleges in the Detroit area that were interested in implementing Tech Prep initiatives.

### **First Step**

One of the schools in the DPS is the Breithaupt Career and Technical Center (BCTC). Originally, BCTC offered primarily vocational programs for students who were uninterested in pursuing four-year college degrees. Aware of BCTC and its services to

students in the DPS, several local community colleges approached the center. Because of its interest in forming Tech Prep partnerships with community colleges and local industry, BCTC then approached industry representatives. To get all parties together to discuss concerns and possible solutions, BCTC hosted a luncheon for teachers, instructors from local colleges, counselors, and industry personnel. At the luncheon, industry representatives made the point that the basic mathematics and communication skills of new employees were weak. Furthermore, problem-solving and affective skills, such as punctuality, time management, and appropriate behavior on the job, were lacking, and students were not trained well enough to work in more than one area of industry. When these and other needs and concerns had been voiced, the steps to building a seamless Tech Prep program at BCTC began.

BCTC's start-up costs included the purchase of computers, televisions, VCRs, telephones, and laboratory equipment for its programs. Money for faculty and administrative salaries was needed as well. Fortunately, the building was already in place and needed only minor renovations. Students attending BCTC pay only the cost of their uniforms, which never exceeds fifteen dollars. Today, BCTC needs funding primarily to keep the technology and equipment in the labs up-to-date and for projects and curricula that must be updated periodically because of changing standards in industry and education.

## *Funding*

In 1993, the Michigan Department of Education and the Federal Job Commission accepted a BCTC proposal to initiate the Tech Prep programs. Funding from these agencies continues to support the programs at BCTC.

The staff at BCTC also writes proposals requesting funding from private, state, and federal grant agencies such as the U.S. Department of Education. Because BCTC is considered a Detroit public school, federal and state grant proposals must first go through the DPS Department of Grant Procurement, which decides if a grant is worth pursuing. This department's main responsibility is to ensure that all the Detroit public schools or a large portion of the DPS student body benefits from state and federal grant awards. If BCTC is awarded a state or federal grant, the money goes through the Grant Procurement Department and is put into a special BCTC account. BCTC also receives donations from industry partners in the forms of equipment for classrooms and labs, vehicles for field trips, opportunities for job shadowing, and cooperative learning experiences.

***B***reithaupt has an experienced group of volunteers made up of teachers and industry personnel, both current and retired, who work with the students in group situations as well as on an individual basis.

## ***Advisory Groups***

BCTC has an advisory committee for each degree program and one general board. BCTC's program committees address the skills needed in the current market and the best way to teach the skills. They analyze current problems and the apparent causes of those problems. Curriculum enhancement, job shadowing procedures, and prerequisites are some of the other issues the program committees discuss. Instructors are required to sit on their corresponding program committees. Industry representatives are selected on the basis of recommendations from teachers at BCTC and the general board. The committees meet once a month.

The general board, which is made up of members of the individual degree program committees and persons from the general business sector, such as lawyers, judges, and law enforcement officials, keeps up-to-date on skill standards and technology, acts as a general advisory committee, and finds internships for students. Members of the general board also act as judges for Vocational Industrial Clubs of America (VICA) competitions. Board members are chosen by BCTC instructors, who ask local business and industry men and women and city officials to serve. Members of the board also meet once a month.

Having the right teacher can make all the difference, especially to students who think school is a waste of time. Teaching at BCTC is a special type of instruction that calls for an educator who knows how to get students

## ***Teachers and Instructors***

involved in and motivated by hands-on activities. BCTC recruits academic and vocational teachers through the DPS personnel department, which sends out job specs that include all the required criteria. The job specs are posted at schools and affiliated organizations. Instructors at BCTC are either state certified school teachers or state licensed and certified technicians, all of whom need to be well informed about the latest technologies. BCTC instructors are expected to act professionally, display affective skills and positive attitudes, and be supportive, especially toward the students. Being a team player is also essential. Team teaching, curriculum improvement, and meetings are all part of everyday life at BCTC, so good communication skills are important. The academic teachers generally help students with core academics such as mathematics and science by addressing these subjects from a hands-on, pragmatic approach. The vocational instructors, most of whom work in industry, teach the skills classes such as Performing Metallurgical Operations, Auto Service, Principles of Baking, and Constructing Dimensions. Core academics and vocational concepts are combined often in the skills classes to help students better understand the concepts they learn in their home schools and at BCTC. For example, an automotive student might find it easier to grasp the complex concepts of geometry if these ideas are connected to the makeup and operation of an internal combustion engine.

***B***reithaupt instructors are expected to act professionally, display affective skills and positive attitudes, and be supportive, especially toward the students.

BCTC tries to stay in contact with the core academic teachers at the home schools, encouraging them to use applied concepts in the classroom. (This communication is not mandated by the state of Michigan, but BCTC considers it extremely important.) BCTC is trying to set up communication between its labs and the home school classrooms so more hands-on applications can be used in the home schools. Staying in touch with those who participate in the futures of the students is beneficial because it makes the home school teachers aware of the activities at BCTC and gives the instructors and counselors at BCTC the opportunity to know how and what the students are doing at the home school.

In the Detroit Public Schools system, every sixth-grader must complete an educational development plan (EDP) with a counselor. The EDP is an inventory developed to see what a student's career interests are and what academic path would help foster those interests. The EDP is mandated by the state of Michigan, which requires that students be reevaluated upon entering the ninth grade. After the counselor analyzes the completed EDP, he or she recommends a particular degree plan for the student. If it appears that the student would benefit from a more nontraditional curriculum, the counselor will generally recommend a career technical center (there are four in the Detroit area). Students can also seek out a counselor and express interest in the technical/career

## ***Student Qualifications***

programs. However, students cannot simply walk into BCTC and sign up for classes. If a DPS student or a student from one of Detroit's private schools comes to BCTC to apply, BCTC will send him or her to the appropriate home school counselor, who will evaluate the student's interest inventories and career interest surveys to see if programs like those at BCTC would be beneficial. The student is also asked at this time to fill out an application, which is considered complete only if it has a parent's or guardian's signature. If a place like BCTC seems appropriate for the student, the counselor will forward the application to BCTC or one of the other career technical centers, depending on the student's areas of interest and which center would provide the best program for pursuing those interests.

To make its programs accessible to everyone, BCTC accepts all students who successfully complete the application process. Generally, these students are in the eleventh and twelfth grades. When the students are enrolled at BCTC, they must choose three career options and rank them in order of preference. If a student finds the curriculum of first choice too difficult, he or she will meet with a BCTC counselor, who will usually recommend that the student try his or her second or third choice. If these options fail as well, the student must go back to the home school full time. However, according to the School-to-Work coordinator, students almost always find a career program suited to their academic strengths.

Because attendance is essential for learning and mastering the academics and skills, students cannot miss more than ten days per academic year, and all missed days must be made up on the students' time, which means students must come in after school, during lunch hour, or during evening sessions.

## *Writing the Curriculum*

Curriculum development at BCTC was an extensive process involving several people. The Center for Occupational Research and Development's (CORD) staff provided introductory training that included a myriad of information about Tech Prep, its philosophies, and the best way to use it in the classroom. CORD, with help from teachers who had previously taught applied academics, demonstrated with hands-on labs and interactive lectures the most effective ways to use applied academics.

Following the initial training, BCTC organized its own curriculum development teams, each made up of an academic teacher from a Detroit public school and an instructor from BCTC. The teams worked on turning traditional curricula into active, hands-on instruction. Industry representatives and BCTC instructors worked on developing the vocational curricula. Some of the main topics discussed were establishing relevancy, avoiding overlap of courses, and producing a successful student achievement program. Using SCANS and Michigan Educational Assessment Program (MEAP) objectives, textbooks, old curricula, and program competencies identified in each area, a series of vocational curricula was created.

The curricula took one year to create; training began in the fall of 1992. After many periodic meetings, writing sessions, and critiques, the curricula were ready to use in the fall of 1993. BCTC normally has between fifteen and twenty students per classroom. It

was found that the curricula worked best with two teachers in the classroom, one teaching vocational skills and the other acting as a support instructor to the special population students. (A special population student has a GPA lower than a 2.0 and may be identified as high-risk.) This type of team teaching prevents advanced students from becoming bored and provides other students with personalized assistance.

**W**riting the curriculum is the most time-consuming component of any Tech Prep or School-to-Work program because it is a never-ending process.

One year after the curricula were introduced into BCTC classrooms, educators from the National Center for Research in Vocational Education (NCRVE) at the University of California at Berkeley toured BCTC and analyzed the newly developed curricula. The NCRVE team was impressed with BCTC and its curricula and ranked the program as one of the top vocational programs in the country. Once a year, generally in the summer, home school teachers, BCTC instructors, and industry personnel get together to revise and update the curricula, focusing on integrating better techniques, throwing out tactics that do not work, and adding new state-mandated academics and skills.

In addition to the applied academics and vocational curricula, BCTC teaches a course on employability skills that all students are required to complete. The course is taught once a month by BCTC's counselors, who show the students how to write resumes, dress for interviews, and resolve conflicts. The importance of professionalism is also stressed. New students must also go through a three-week course on safety before beginning their programs at BCTC.

This course addresses safety in the laboratories and classrooms at BCTC as well as safety at the job site.

Grades are awarded on a scale of 1 to 4. One indicates a minimum achievement level; four indicates that a given skill has been mastered and that the student is able to transfer what he or she has learned in class to the skill performance area. At the end of the semester, the numeric grades are averaged into a final grade that represents completion of all course competencies. Where applicable, a completed course can then articulate to the postsecondary level. Also, at the end of every semester, each class is given state-certified performance tests. The state tests are divided into sections, each having its own set of questions. A student who fails certain sections does not necessarily fail the entire exam, just certain skills. If the student does not pass certain areas of the test, he or she still moves on to the next semester. But the new instructor must focus on the premature skills from the previous semester and work with the student on mastering those skills. If, after all remedial work has been attempted, the student still cannot pass certain sections of the test, she or he receives a certificate of participation for the finished work, but not a certificate of completion.

BCTC must adhere to extensive federal and state laws regarding the number of hours a child can work, the type of work a child is allowed to perform at the worksite, and basic liability in work involving students. While

## ***Assessment***

## ***Understanding Laws and Liabilities***

students are at their home schools, the home schools are responsible for their safety. But when students leave the home schools to go to BCTC, BCTC is liable for students inside its building, on its buses and other vehicles, at job sites while job shadowing, and on BCTC field trips. (If a company hires a student to work a co-op position, the company is responsible for the student's safety at the job site.) BCTC uses written forms to obtain permission from legal guardians for students to participate in job shadowing and field trips.

**Labor laws and liabilities must be taken into consideration by any business, but especially one that employs students.**

One way BCTC keeps track of its students is by requiring them to wear uniforms in the building and while job shadowing. The uniforms are generally coveralls and smock tops, which display the BCTC logo, and work shoes. Other than being worn to the job site, the uniforms are not to leave the building. Another safety mechanism is the use of a time clock. Upon arriving at and leaving BCTC, students must clock in and out. This allows the staff at BCTC to keep track of students in the building as well as know who has been there on any given day.

Students are bused to BCTC from the home schools. BCTC recommends that all its students ride the buses. Students can drive their own cars; however, BCTC is not responsible for accidents or problems that happen to students while driving their own cars. A fifteen-passenger School-to-Work van, donated by General Motors, is also available. BCTC is liable for passengers riding in the van.

BCTC seeks legal counsel on general matters from qualified people on its committees and general board. On more involved matters, BCTC can obtain legal advice, at no charge, from lawyers

housed in the DPS Legal Affairs Department of the Detroit Board of Education.

BCTC uses many methods to make the community aware of its programs. Throughout the spring and/or one to two weeks before and after the fall and spring semesters begin, counselors from BCTC visit area high schools to talk with potential students and distribute applications and literature about the programs. Another way BCTC markets its programs is by participating in career days at local high schools. At these expos, BCTC sets up booths, shows videos about its programs, demonstrates program-related activities, and has current and past BCTC students talk to interested individuals.

BCTC also hosts an Annual Career Expo, to which it invites approximately one hundred groups, including companies, colleges, and the military, to set up booths. This event includes technical sessions on programs offered at BCTC, problem-solving workshops, exhibits, and seminars set up to explore innovative ways companies are increasing their competitiveness in the workplace. BCTC invites the media to attend. BCTC also holds periodic open houses, disseminates flyers, and creates advertisements for radio, television, and newspapers.

Because BCTC, as a nonprofit organization, is considered a public service institution, many of the items it uses for marketing are donated. This may be the case for all public schools; thus, contacting local newspapers and radio stations to see if they offer similar

## ***Marketing***

***Job  
Shadowing,  
Cooperative  
Education,  
and  
Mentoring  
Experiences***

programs is a good idea.

Students can be excellent marketing tools both directly by word of mouth and indirectly by wearing paraphernalia displaying the program's logo or name. The students at BCTC are given T-shirts and caps, and on certain days they all wear the BCTC articles to their home schools.

Job shadowing is an important facet of BCTC's program. How often or when students participate varies from job site to job site. Some students go as often as once a week, while others go only once a month or even once a semester. Detroit industry representatives who are active in BCTC's programs encourage job shadowing because it allows them to see firsthand how students present themselves in an occupational setting, thus offering some insight into how they might act in new situations, under pressure, and in the presence of coworkers, supervisors, and clients.

To participate in BCTC's job shadowing program, students must be recommended by a school counselor, a current instructor, and a past instructor or teacher. A BCTC counselor finds a job site for the student. While job shadowing, students are evaluated by their industry mentors once a semester. BCTC provides these mentors with special forms that categorize skill areas and use a ranking system to indicate how much the student has learned at the worksite. The forms must be returned to BCTC for students to receive credit for the job shadowing experience. The

BCTC counselor goes to the site at least once a week to make sure the student is participating and to talk to the mentor and other employees about the student. Job shadowing positions are usually not paid positions.

BCTC students can also participate in a cooperative educational (co-op) experience. Co-op positions are available to students who have been in the program for at least one and a half years and have been recommended by a BCTC instructor. Students involved in co-op experiences are evaluated by their supervisors, who use a booklet developed by the DPS to determine whether the students have mastered the appropriate skills. The evaluation process requires an observation of a student performing his or her regular duties, a written performance report from the supervisor, and a meeting between the student and the supervisor to discuss the evaluation. Evaluations are done once a semester. A BCTC counselor acts as a designated co-op counselor, and he or she goes to the job site to check-up on the student and talk to the supervisor about the student's performance. Students in these positions are generally paid an hourly wage and work on a regular basis, such as every afternoon or once a week, again depending on the job site.

***M***any people—instructors, staff members, school counselors, and industry personnel—serve as mentors.

The mentoring component of the BCTC program creates an atmosphere of openness that is conducive to meaningful communication. BCTC students are encouraged to ask questions, talk about concerns, and express their thoughts. In turn, BCTC students serve as supporting mentors to third-, fourth-, seventh-, and eighth-grade students who come to BCTC once a month to observe and participate in some of the daily activities. BCTC students also serve as guides when groups from local schools are invited to tour the facility. According to BCTC's School-to-Work coordinator, the students who act as tour guides feel a sense of importance as students and teachers ask questions and look to them for information and advice about BCTC.

## ***Conclusion***

In 1995 BCTC won the National Tech Prep Network second-place Exemplary Worksite Learning Award, and in 1997 it won the Michigan Career Technical Exemplary Worksite Program first-place award. Ninety-five percent of the students who complete programs at BCTC graduate from high school and advance to the postsecondary level, and 97 to 100 percent of those students find jobs in their fields.

Every year, things change at BCTC: curricula, faculty, technology needs, and much more. And every year, the Detroit Public Schools system's administrative staff must analyze the cost efficiency and supply and demand of the programs offered at BCTC. But the effort is clearly worthwhile, for beyond the funding, proposals, and administrative

duties are the students, many of whom once headed toward uncertain futures. Some of the students at BCTC have criminal records, some have dropped out of school two or three times, and many have fought against a plethora of negative influences. But because of the opportunity they received to come to BCTC, set goals, and accomplish dreams, these “at risk” students are now on the road to completing their high school education and starting long-term, rewarding careers. BCTC focuses on what it calls the three C’s: Commit to high standards, Challenge the status quo, and Change constantly for the better. BCTC is excited about its future and the future of America’s youth because, with programs like those it offers, everyone has the opportunity to succeed.

***Beyond the nuts and bolts of the program—the funding, the proposals, and the multitude of administrative duties—are the students, many of whom once headed toward uncertain futures.***

## **Seminole Consortium**

According to the *Occupational Outlook Handbook*, the Bureau of Labor and Statistics projects that between 1994 and 2005, computer technology and electrical and electronic technology will be among the fastest-growing occupations. This prediction is no surprise to the Siemens Corporation, which employs approximately 47,000 people, many of whom are technicians. At locations throughout the United States, the Siemens Corporation generated eight billion dollars in the 1995-1996 fiscal year. However, although Siemens has no trouble maintaining a steady flow of business, it did have trouble keeping skilled, qualified technicians on its payroll. This was especially so for the Siemens Stromberg-Carlson facility in Boca Raton, Florida, which in the early 1990s found it difficult to locate qualified technicians to work in the telecommunication industry. As one of the leading telecommunication equipment and service providers in North America, Siemens had neither the time nor the money to invest in training and retraining technicians who were not prepared to work in the telecommunication field. Thus, fully aware of the growing need for technicians, it decided to join forces with education.

### ***First Step***

In 1991, Siemens Stromberg-Carlson contacted Seminole Community College (SCC) in Sanford, Florida, to discuss solutions to the dearth of qualified technicians. Siemens representatives told SCC administrators that new employees lacked not only proficiency in cabling, fastening, trouble-

shooting, and schematics reading and nomenclature, but basic theoretical knowledge.<sup>4</sup> Academic skills, especially in mathematics, were also lacking in applicants. The representatives pointed out that without a basic academic foundation, it is almost impossible to work effectively at any Siemens facility.

Siemens Stromberg-Carlson invited SCC's Tech Prep coordinator to the manufacturing facility in Lake Mary to observe employees at work and to get a better idea of the occupational demands, both mental and physical, at Siemens. The Tech Prep coordinator also met with representatives from Siemens's headquarters in Munich, Germany, to discuss Tech Prep and youth apprenticeship. Siemens thought the Tech Prep philosophy coupled with Germany's "dual system" of workforce training (classroom instruction combined with hands-on vocational training) would be the key to creating well-trained and highly skilled electronics technicians.

Initially, the program was offered only to students who were graduating from high school or had already graduated from high school. However, to increase the pool of skilled applicants, the program was expanded to include students from local high schools. SCC approached the Seminole County Public Schools system (SCPS) to see if there was any interest in partnering with SCC and Siemens Stromberg-Carlson. School board representatives were very interested. Lyman High School and Oviedo High School already had electronics programs with equipped laboratories, so these schools became the primary feeder schools.

**W** *Without a solid academic foundation, it is virtually impossible to work effectively at any Siemens facility.*

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<sup>4</sup> John Tobin and Suzanne Tesinsky, "Model Partnership with a Large Corporation," Chapter 13 of *1996-97 Occupational Outlook Handbook: Tomorrow's Jobs* (Washington, D.C.: Bureau of Labor Statistics, U. S. Department of Labor, 1996), 195.

To get a better feel for the German dual system and how it might interact with a Tech Prep program, eight representatives from SCC, SCPS, and Siemens embarked for Europe on a study tour (financed by Siemens). While in Germany, the SCC and SCPS electronics program representatives observed how the German apprenticeship model worked and frequently discussed how such a model could fit into American schools and industries. At the same time, back in Florida, participating instructors from SCC and SCPS attended staff development workshops that addressed applied academics and the logistics behind integrating academic and vocational training.<sup>5</sup>

## ***Start-up Committee***

A start-up committee made up of instructors and administrators from SCC and technicians and managers from Siemens was created to develop and implement the program. Teachers, principals, and counselors from the participating high schools offered insight and advice to committee members. The committee worked to translate the German curriculum into English and integrate it into SCC's curriculum; establish articulation agreements; and develop student guidelines and requirements. The committee as a whole met only on an as-needed basis, but certain members met regularly. Members of the start-up committee were not elected; they were asked to serve by SCC administrators and Siemens representatives because of their knowledge about Tech Prep, apprenticeship programs, electronics, and education.

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<sup>5</sup>Tobin and Tesinsky, 197.

## *Funding*

Before seeking outside funding, representatives from SCC, SCPS, and Siemens Stromberg-Carlson assessed the materials and facilities already in place. SCC and two SCPS high schools already had electronics programs with laboratories in the schools. Money for the equipment in these laboratories came from and continues to come from Tech Prep funding. The labs at SCC and SCPS were sufficient; however, Siemens Stromberg-Carlson decided to renovate part of its Lake Mary training center to accommodate certain equipment that the other labs could not.

To receive funding to start the electronics/telecommunication apprenticeship program, representatives from SCC and Siemens Stromberg-Carlson wrote a proposal to the U. S. Department of Labor requesting financial support for the hands-on training at the worksite and the academic training at the high schools and college. The Department of Labor granted Siemens Stromberg-Carlson \$249,000. After the grant money was spent, Siemens Stromberg-Carlson began funding, and continues to fund, the majority of the electronics/telecommunication apprenticeship program. Because SCC, SCPS, and Siemens Stromberg-Carlson are in full partnership, SCC and SCPS do not seek funding from other sources.

The start-up costs for the program totaled approximately one million dollars. These costs included renovations of the labs, updating equipment, installation of new

equipment, and implementation time, which consisted of time spent in staff meetings and in updating the curriculum. Costs incurred today range from paying student stipends to updating technology and maintaining the training center. High school seniors who complete the unpaid internship at the training center and are accepted to attend SCC receive a \$1,000 scholarship from Siemens Stromberg-Carlson. Students who attend SCC and participate in the program receive approximately \$4,500 a year for their on-the-job training. And because this program is a state-registered apprenticeship program, Florida exempts these students from paying tuition and lab fees. (Before this program qualified for the exemption, Siemens Stromberg-Carlson paid all the apprentices' academic expenses.<sup>6</sup>)

Eventually, Siemens Stromberg-Carlson moved the training lab to the SCC campus. It did this to attract more students and business partners, reasoning that a business or industry would be more apt to participate in a program located at a neutral site, such as a college campus, than a site owned and operated by another business or industry.<sup>7</sup> A building to house the program was already available at SCC. Renovations were made to create three classrooms and one lab. This building, which opened in January 1997, cost Siemens Stromberg-Carlson approximately \$500,000.

Siemens Stromberg-Carlson estimates that it spends between \$18,000 and \$20,000 per graduating apprentice, which is roughly what it spends to train a new employee on the job.<sup>8</sup> It costs Siemens Stromberg-Carlson around \$500,000 each year to train all of the students in the SCC, Siemens Stromberg-Carlson, SCPS program. However, this money is well spent, as 100 percent of the students who have graduated from the program have qualified for positions at one of the United States' fourteen Siemens facilities, earning \$18,000 to \$35,000 per year.

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<sup>6</sup> Tobin and Tesinsky, 196.

<sup>7</sup> Tobin and Tesinsky, 197.

<sup>8</sup> Tobin and Tesinsky, 196.

## ***Program Structure***

Developers of the electronics/telecommunication apprenticeship program created four essential elements necessary to produce a successful program. The first element was a high school curriculum that included mathematics, science, and communication courses taught in an applied setting. The second was a set of articulation agreements between SCC and SCPS that provide a seamless transition from high school to college. Third was a special apprenticeship curriculum to be used by the postsecondary students in the program. And the fourth element was that, upon completing the program, students would earn an associate of science degree in telecommunication engineering technology from SCC.<sup>9</sup> When the essential elements were established and the study tour group had returned from Europe, the program began to take shape.

The electronics apprenticeship program has two basic avenues, one for high school students and one for college students. High school students have three options, one of which is a three-year electronics program. The electronics classes are special two-hour block classes designed to allow time for labs and demonstrations. The program also uses applied academics in mathematics, science, and communication for students who qualify. The applied academics begin with the freshman year and continue through graduation. The electronics program begins with the sophomore year. Students can join the pro-

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<sup>9</sup>Tobin and Tesinsky, 197.

gram at the beginning of any year, but juniors and seniors cannot attain the number of credits needed to graduate from the program, although they receive credit for taking the courses. When students who start the program as freshmen reach their senior year, they can go an extra year and learn more about advanced electronics. During their senior year, students spend two afternoons a week, totaling six hours a week, at the Siemens Stromberg-Carlson training center.

High school students can also participate in the 2+2 Tech Prep program. Students in this course of study take applied courses in mathematics, science, and communication. They also can participate in the electronics classes. During their senior year, these students have the opportunity to go to the Siemens Stromberg-Carlson training center at SCC. Under agreements established between SCC and SCPS, Tech Prep students can articulate certain applied academics and electronics classes. If a student is not enrolled in a Tech Prep program or one of the two electronics programs, he or she can take dual-enrollment courses in electronics at SCC and receive both high school and college credit. Seniors taking this route can also participate in hands-on labs at the Siemens Stromberg-Carlson training center.

Postsecondary students enrolled in the telecommunication engineering technology program take college courses at SCC and participate in more in-depth, hands-on activities at the training laboratory. The program takes two years to complete, one and a half years of course work and training and six months of on-the-job training as a technician in training at one of the Siemens service sites. These students range in age from early twenties to mid-forties. Generally, they spend an average of twenty hours a week at the training facility and twenty hours a week in class at SCC. Two out of the seven semesters require on-the-job training at a Siemens Stromberg-Carlson service site. (Most of the training for the postsecondary students and all of the training for the high school students occurs either at the schools or at the training center at SCC, not at the Siemens service sites.) Upon completing the program, students receive a “technician certificate” from Siemens and an

associate degree in telecommunication engineering from SCC.

The curriculum developed for the program is unique in that it combines the German dual system philosophies with American academics. However, students do not use this curriculum until they get to the postsecondary stage. The high school students use either the Tech Prep curriculum, which includes applied academics, or the regular core curriculum. Every high school in SCPS offers applied academics courses in mathematics, science, and communication that are modeled after the CORD applied academics curricula. Secondary students in the electronics program use the electronics curriculum combined with either applied academics or the regular core curriculum.

Initially, the curriculum needed work. For starters, it was written in German; thus, translation along with adaptation needed to be done. These began in the fall of 1992. Second, the curriculum was developed using European standards, which are very different from standards required of electronics curricula in the United States. However, because of the differences between European and American industries and economies, it was not necessary to integrate the entire curriculum but only to adapt certain parts of it. A “meister” (an expert instructor) at Siemens Stromberg-Carlson who was familiar with American business and industry standards decided which German standards should be translated. Electronics instructors from SCC and instruc-

## *Curriculum Development*

tors from Siemens Stromberg-Carlson met regularly to evaluate each college course and integrate the German adaptations. Although fairly up-to-date, the SCC curriculum lacked the hands-on components as well as some of the basic academics needed to give students an adequate understanding of the technology used at Siemens Stromberg-Carlson. Working together, the SCC faculty and Siemens Stromberg-Carlson instructors enhanced the existing electronics curriculum by adding more hands-on laboratory exercises and honing in on the specific mathematics, science, and communication skills that needed to be mastered by students in the program.

***The curriculum developed for the program is unique in that it combines the German dual system with American academics.***

To develop the curriculum, many resources were used, including high school and college textbooks and curricula, as well as materials from the manufacturing plant. Siemens Stromberg-Carlson also used its own curriculum, called “Sitrain,” which stands for “Siemens training.” Sitrain is an outline of occupations and job responsibilities used by Siemens Stromberg-Carlson to train its employees. All of these resources helped create the electronics curriculum. The curriculum has been and will continue to be revised. Different standards, better teaching techniques, additional required courses, and changes in technology are some of the many reasons the curriculum is constantly being updated.

## ***Student Qualifications***

This program is not quick and easy; the academics are demanding and the work component requires a serious commitment from each student. Thus, choosing students for the program is hard work. Committees are formed to review applications and discuss which students should participate in the program. The high school counselor, the electronics teacher, applied academics teachers, and representatives from Siemens Stromberg-Carlson generally make up the high school committee. These members are appointed by SCC and SCPS. Representatives from Siemens Stromberg-Carlson and SCC make up the postsecondary committee.

The high school counselor identifies a pool of eligible and interested students to participate in the electronics classes or the electronics program. For the electronics program, SCC and SCPS appoint a committee to evaluate the student by looking at his or her grades and current math status. Because math is a large part of the electronics program, students need to be in at least algebra I (applied or traditional) to be prepared to participate in this program. At Lyman High School, the electronics teacher, who has the final say, has rejected students in the past for having grades below the “C” range and/or deficient math preparation. Students in the electronics program must maintain a 2.75 overall GPA and satisfactorily complete all projects and exams. If students fail to meet these requirements, they are dismissed from the program.

***This program is not quick and easy; the academics are demanding and the work component requires a serious commitment from each student.***

Students who are not interested in participating in the electronics program per se but *are* interested in taking the electronics classes and going to the Siemens Stromberg-Carlson training center during their senior year must adhere to the grade and academic requirements adhered to by students in the electronics program.

Seniors in the electronics program or students interested in starting the program at the postsecondary level (i.e., high school seniors or older individuals returning to school) are required to fill out SCC and Siemens Stromberg-Carlson applications. All of the completed information goes to the Tech Prep coordinator at SCC, who submits it to the committee that selects students. One of the first things addressed is what the student scored on his or her college placement tests (SAT or ACT). To be considered for the program, most students must score a 25 on the math portion and a 16 on the English portion of the ACT or a 560 on the math section and a 420 on the English section of the SAT. Other basic requirements are an overall high school GPA of 2.75, proven eligibility for college algebra and freshman English composition, and a 3.0 high school math GPA. All of this information is listed on a check-off form developed by the electronics teacher at Lyman High School and used by Siemens Stromberg-Carlson. Copies of the form are distributed to interested seniors in August when representatives from Siemens Stromberg-Carlson visit high schools to discuss the program. Thus, students know what is expected of them and when every requirement must be met. Students are not accepted into Siemens

Stromberg-Carlson’s portion of the program until they have been accepted by SCC.

High school students in the program are graded by the standards set forth by their schools and the state Department of Education. Students must have a 2.0 out of a 4.0 GPA to graduate from a Florida public high school. At the Siemens Stromberg-Carlson training facility, students are assessed on the basis of independent work, group-planned individual work, or group-planned group work, depending on the project they are assigned.

Academic appraisal of articulated classes is set between the high school and SCC. Generally, to receive college credit, a student must make a “C” or better in the high school class. Students must also satisfactorily pass a comprehensive exam given by SCC. The exam is offered at least once a year; the SCC and high school instructors identify the competencies to be tested. To receive course credit, a student must also enroll at SCC within five years of graduating and must complete an SCC Request for Tech Prep Credit.

Both secondary and postsecondary students must also meet skill standards set by Siemens Stromberg-Carlson. To evaluate their students, Siemens Stromberg-Carlson personnel use the *Siemens Hourly Performance Evaluation Instruction Manual*, which includes information on expectations regarding attendance, quality and quantity of work, and work habits. In addition to these criteria, students are evaluated on their knowledge of

## **Assessment**

different jobs and their understanding of teamwork, giving mentors and instructors an idea of how well the students are transitioning into employees. Competencies developed by the Secretary's Commission on Achieving Necessary Skills (SCANS) are also incorporated into the assessment.

SCC students participating in on-the-job training and job shadowing at one of the Siemens Stromberg-Carlson service sites, which are located in and around the Sanford/Lake Mary area, receive letter grades (A, B, C, D, and F) from their mentors and supervisors. A supervisor may be a site manager, a branch manager, or a technical instructor. Students are evaluated after every training period, which may be as short as two weeks or as long as six weeks, depending on the project. During the evaluation, each student receives a letter grade, a written and oral assessment, and an opportunity to discuss concerns, needs, expectations, job performance, and other relevant matters with the mentor and the supervisor. At the end of the semester, the grades are totaled and a semester grade is given based on the number of points received (90-100 points = A, 80-89 points = B, and so on). These grades transfer to SCC for course credit.

At SCC, students receive grades at the end of every semester for their projects, course work, and exams. A 2.75 GPA must be maintained throughout the program, and all projects and exams must be completed satisfactorily. Students who fail to meet these requirements are dropped from the program. About twenty students are accepted into the postsecondary track of the program every year.

## ***Staffing***

Participating high schools generally have one electronics teacher and two or more applied academics teachers. The teachers must be state certified within their disciplines. At Lyman High School, which is the apprenticeship program's primary feeder school, the electronics instructor is state certified in electronics, math, and physics; has a bachelor's degree in electrical engineering; was an electronics technician for almost eleven years; and taught electronics in the navy. The applied academics teachers are state certified in math and science. There is no team teaching in the program; however, the teachers get together periodically to discuss teaching techniques and ways to help the students succeed in each other's classes. The electronics instructor also gives the applied math and science teachers old equipment so that they can perform in-class demonstrations.

At the Siemens Stromberg-Carlson training facility, an instructor called a "meister" teaches hands-on concepts. This instructor is either a certified technician or an engineer from the Siemens Stromberg-Carlson plant in Lake Mary. He or she helps students work through their projects and learn about industry-specific safety and environmental issues.

The instructors who teach the postsecondary students in the Siemens Stromberg-Carlson program are members of the electronics faculty at SCC. These instructors received no special training on how to use the new curriculum because they were

already qualified postsecondary electronics instructors; however, it did take some time for them to get acquainted with the new curriculum and the German dual system of workforce training. These instructors focus on the theoretical aspects of what the students are learning in the training facility.

The counselors at the high schools are responsible for assessing whether students are potential Tech Prep or electronics program candidates, informing the students of the intensity of the program, and stressing the importance of the academics associated with the program. Counselors must also set up the students' schedules and handle their paperwork. Counselors are responsible for getting the word out about Tech Prep, School-to-Work, and apprenticeship initiatives.

**Counselors at both the secondary and postsecondary levels play very important roles.**

At SCC, a counselor is available to postsecondary electronics/telecommunication students. This counselor is primarily responsible for discussing the program with interested students, advising students already in the program, and registering and scheduling classes for new students. Students also come to this counselor to discuss future academic work at other colleges and universities and to discuss personal problems, especially if the problems are interfering with the students' success in the program.

## ***Mentors, Job Shadowing, and On-the-Job Training***

Mentors for the postsecondary students become involved during the students' on-the-job training, which takes place at the Siemens Stromberg-Carlson service sites. Mentors are selected by their immediate supervisors. They receive information and training about the program so they can be prepared to take part in the teaching and grading processes. Soon after they are appointed, the mentors are introduced to the training center and the concepts taught at the facility. The SCC students are randomly matched with mentors or are teamed with mentors from departments that need assistance. Mentors at the postsecondary level participate in assessing the students' daily performance, providing instruction and feedback, and grading completed projects.

At the high school level, the mentors, who are also called "meisters," are at the Siemens Stromberg-Carlson training center. The mentors teach basic telecommunication engineering and assist students in their building projects. The mentors help the students with each step, showing them the importance of organization, planning, and understanding project development.

Because job shadowing is done at Siemens Stromberg-Carlson service centers, high school students do not participate in job shadowing. SCC students job shadow in their third semester. During this experience, students get to work closely with mentors in a manufacturing facility. After completing each project, the students are evaluated with an

assessment form for industrial trainees. Students are graded on the basis of five criteria: work planning, work implementation, work quality, independent work style, and occupational safety and environmental protection. Each of the five criteria has subcriteria.

Postsecondary students also participate in on-the-job training during semester three (during which the on-the-job training and job shadowing components are combined) and semester five. The students are graded under the same guidelines set forth in the job shadowing stage. To participate in on-the-job training, students must satisfy academic, technical, and personal prerequisites. For example, students must already have taken college algebra and DC/AC electronics and understand the importance of teamwork. Students must also adhere to a training schedule that comprises tasks and information to be learned during the on-the-job training.

## ***Marketing***

Counselors play an indispensable role in marketing the high school program. They distribute brochures explaining the electronics/telecommunication program and ask teachers and other staff members to talk to students about the program in class or at assemblies. At the beginning of every school year, the electronics teacher at Lyman High School gives all freshmen a tour of the electronics lab and a five-minute talk on the electronics program and Siemens Stromberg-Carlson.

At SCC, the Tech Prep coordinator and Siemens Stromberg-Carlson representatives

periodically set up table tents around the campus, discussing the program with students and distributing printed information. The Tech Prep coordinator also sends information to high school seniors and invites them to SCC to learn more about the electronics/telecommunication degree and the partnership with Siemens Stromberg-Carlson. During career days at local high schools, SCC staff members and Siemens Stromberg-Carlson representatives disseminate information, demonstrate hands-on labs, and talk to interested students. The best marketing tool, according to SCC's Tech Prep coordinator, is word of mouth. A recruiter from the SCC admissions department assists in recruiting students by handing out information about the electronics/telecommunication program while recruiting students for other SCC programs. This person handles the students' paperwork until they are accepted into the program. Then responsibility shifts to the college counselor.

This collaborative effort between SCC, SCPS, and Siemens Stromberg-Carlson is one of the best examples of how the integration of academics and occupational training facilitates the movement of students from high school to college to work. This partnership has gained national recognition from the U. S. Departments of Labor and Education, and in 1993, the Florida Association of Community Colleges named this program the outstanding occupational program in the state.<sup>10</sup>

Because of planning, communication, trust, and flexibility among members of the

## ***Conclusion***

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<sup>10</sup>Tobin and Tesinsky, 196.

participating institutions, this program was so successful that the first-year apprentices in Florida outscored their German counterparts on a day-long exam taken by students in both Lake Mary, Florida, and Munich, Germany. Even though the teaching and coordination of the program are excellent, the students deserve recognition as well. The students in the program are diverse; among them are high school students, parents, spouses, college students, second or third degree seekers, honors students, GED students, and others. But within this diverse group is a common bond: a desire to be part of an occupation that offers career advancement, advanced educational opportunity, and skills that will last a lifetime. The electronics/telecommunication apprenticeship program gives many students the chance to fulfill this desire and simultaneously gives Siemens Stromberg-Carlson some of the best technicians in the world.

***W****ithin this diverse group is a common bond: a desire to be part of an occupation that offers career advancement, advanced educational opportunity, and skills that will last a lifetime.*

During the early 1990s, the printing industry in Wisconsin was having difficulty finding well-trained workers. The lack of good, qualified help, however, was not limited to the printing industry. Other industries and businesses were encountering the same problem. The governor and representatives from several Wisconsin state agencies began to explore solutions, and in 1991, Wisconsin Act 39, the Wisconsin School-to-Work Initiative, was passed for the purpose of creating a more skilled workforce.

With the necessary legislation in place, a pilot printing program involving two school districts and several businesses was initiated. The goal was eventually to set up youth apprenticeship programs in thirty occupational areas. Soon, representatives of the Wisconsin Banking Association and other people in the finance industry took an interest in the youth apprenticeship programs as well.

Western Wisconsin officials elected to support the youth apprenticeship initiative in the summer of 1993, when a steering committee made up of Tech Prep consortium members and other interested individuals and agencies pulled together funding to hire a regional coordinator. Her first job was to determine which businesses and industries in western Wisconsin might be interested in participating in youth apprenticeship programs. One of the occupations researched was financial services. With the help of state agencies such as the Wisconsin Bankers Association and the Credit Union Association,

## ***Western Wisconsin School-to- Work Consortium***

### ***First Step***

the regional coordinator created a list of potential business partners from the financial services industry. Representatives of the institutions on the list received invitations to attend a meeting intended to give interested parties an idea about School-to-Work and youth apprenticeship programs. High school administrators and Tech Prep practitioners were invited as well. The Wisconsin youth apprenticeship coordinator was on hand to explain the program and answer questions. At the end of the meeting, the regional coordinator asked each person in attendance to complete a survey indicating his or her institution's level of interest in participating in the youth apprenticeship program in financial services. Although some financial institutions and schools seemed apprehensive, many showed interest.

During the next six months, the regional coordinator spoke to principals, guidance counselors, students, and financial representatives. Eventually, she recruited nine school districts and thirteen financial institutions to participate in the program.

***Organizing a  
Governing  
Board and  
Other  
Advisory  
Groups***

The youth apprenticeship programs in western Wisconsin seek guidance from and report to a multilayered group of committees. To develop the Finance Youth Apprenticeship program, two temporary start-up groups were created. These groups were made up of members of the original steering committee and people who showed interest at the November 1993 informational meeting. One was primarily a work group; for example, it

helped produce a handbook that assisted school districts in implementing youth apprenticeship programs. The other was more advisory. Made up of bank presidents and managers, it offered suggestions and provided feedback on program development. Eventually, the original steering committee merged with a former Tech Prep council and a School-to-Work council was formally created, allowing School-to-Work, youth apprenticeship, and Tech Prep programs to be coordinated under the School-to-Work umbrella. The council comprises approximately thirty-six people representing a cross section of business, public high schools, community colleges, local universities, the chamber of commerce, and organized labor.

To prevent the overlap of committees and yet ensure that all aspects of the newly formed Western Wisconsin School-to-Work Consortium were adequately addressed, five committees were created to carry out the council's work. The Finance Youth Apprenticeship program reports to the Work-Based Learning Committee, which acts as the state-mandated advisory committee and addresses issues regarding work-based learning activities (e.g., job shadowing, co-op, and youth apprenticeship), seeks scholarships for students, and provides minigrants to schools that want to participate in work-based learning activities.

Representatives from business and education are invited to sit on the five consortium committees. There is no formal selection process for these positions. The School-to-Work council's selection process, on the other hand, is more formal. Members of this council are chosen every April by current council members and assume official duties the following July. The length of each term is three years. The council annually reviews its list of members and student representatives for all consortium committees.

Workplace mentor meetings are another avenue the youth apprenticeship program uses for obtaining advice and solving problems. Mentors are a state-mandated component of Wisconsin youth apprenticeship programs. Mentors assist, advise, and grade students at the worksite. Mentors are also responsible for ensuring that students are trained in the competencies identified in the state

curriculum. Mentor meetings are held periodically to address problems, share new teaching methods, and discuss student needs. Mentors in the Finance Youth Apprenticeship program are from participating financial institutions. Usually, getting the mentors together once a semester is sufficient; however, occasionally issues arise that must be dealt with immediately. In 1997, mentor meetings are being combined with parent meetings so that parents and mentors have the opportunity to discuss program expectations.

## ***Funding***

The primary expenses stemming from the Finance Youth Apprenticeship program are salaries for classroom instruction, school coordination, and administration. Current funding for the program comes from federal School-to-Work Opportunities Act dollars funneled through the state of Wisconsin. However, western Wisconsin initiated this program before any federal School-to-Work legislation had been passed, so funding for program coordination initially came from two regional organizations: the Private Industry Council and the Cooperative Educational Service Association. A year and a half after the program was initiated, federal School-to-Work funding became available. To receive federal funding for the state of Wisconsin, representatives from several government agencies submitted a proposal requesting federal School-to-Work money. Upon receiving the federal School-to-Work grant, the state Department of Workforce Development (DWD) set guidelines for local consortia to follow to receive state grants. For example,

because the federal government encourages the formation of partnerships, the DWD requires schools to form educational consortia to receive School-to-Work grant money for their programs.

To obtain funding from the state, members of the Western Wisconsin School-to-Work Consortium wrote a proposal to the DWD outlining the consortium's plans to develop youth apprenticeship and other School-to-Work programs. The consortium received a local grant and divided the money among the consortium's School-to-Work and youth apprenticeship programs (including the Finance Youth Apprenticeship program) and then among the twenty-eight districts in the consortium to fund School-to-Work activities in the schools. Each school received a fixed amount and then a per capita amount based on the number of students in the district.

The start-up cost of the Finance Youth Apprenticeship program was primarily the regional coordinator's salary. Other initial costs included printing and postage, handbook development, travel, and meetings. Today's costs include the coordinator's salary and salaries for classroom instructors, which are prorated among participating school districts on the basis of the number of students from each district participating in the program. Students must provide their own transportation; thus, there are no student transportation costs to the program.

The primary costs to participating financial institutions are the wages paid to youth apprentices and the staff time spent in training. Youth apprentices are paid at least minimum wage for their time at the worksite. Financial institutions, however, can obtain state employer-training grants of up to \$500 for first-year students. Participation in the Finance Youth Apprenticeship program also helps financial institutions comply with the federal Community Reinvestment Act, which requires banks to give back to their communities in some way.

## **Writing the Curriculum**

The curriculum in this program was developed at the state level using the DACUM (Developing A Curriculum) process, which is a method of conducting an occupational analysis. As part of this process, the DWD gathered a panel of financial experts to identify the duties and tasks of employees in the financial services industry that must be mastered by youth apprentices. After these training components were identified, a curriculum writer hired by the state developed a curriculum for the teachers and a list of worksite training objectives for the employers. The writer then returned a draft of the curriculum to the panel of experts for verification. After the curriculum was revised, it was ready for dissemination. The writing and verification process took about nine months.

For students to receive state certification for completion of youth apprenticeship programs, they must follow the state's curriculum and meet the state's workplace-training competency requirements. However, individual programs can supplement the state curriculum with additional activities. For example, in the western Wisconsin Finance Youth Apprenticeship program, students take one or two field trips each year to places such as the Federal Reserve Bank in Chicago or to other businesses to observe banking operations not available in institutions in western Wisconsin. The curriculum is updated every three to five years by a state-contracted curriculum writer, usually an instructor from one of the local technical colleges. However, industry changes sometimes demand that the

curriculum be updated before the regularly scheduled review takes place.

The Finance Youth Apprenticeship program begins in the eleventh grade and lasts two years. During each of the four semesters, a different text is used to supplement the state curriculum. Units of instruction are divided into modules, each usually taking four days to complete.

For the Finance Youth Apprenticeship program to be successful, two challenges had to be met. The first challenge was to make the program available to students throughout rural western Wisconsin. Schools from five counties in western Wisconsin offer the Finance Youth Apprenticeship program; many of the schools are in isolated communities. Thus, the regional coordinator decided to use interactive television. Western Wisconsin Technical College (WWTC), which has distance-learning technology, offered its services to the consortium. In the Finance Youth Apprenticeship program, students from nearby communities drive to WWTC four mornings a week, every other week, for a 7:15 class, while students in more rural areas attend class at the same time at one of WWTC's extended campus "receive" sites.

The second challenge was to find an instructor with the expertise to teach the highly specialized finance curriculum. The regional coordinator originally hoped to find someone from the finance community to teach, but in today's banking and finance industry, professionals are highly specialized and do not have

## *Instruction*

time to work full time and teach classes on a daily basis. Therefore, a team teaching method evolved in which the classroom teacher is assisted by volunteer guest instructors from various areas of finance and banking.

The classroom teacher, who teaches full time, is responsible for developing a syllabus, creating assignments, clarifying financial and banking concepts, and maintaining contact with the School-to-Work liaisons. This teacher must be certified or “certifiable” by the State Department of Public Instruction or the Wisconsin Technical College system and be knowledgeable about current finance practices.

The guest instructors come mainly from local financial institutions; local attorneys assist in teaching the semester on business law. Because they teach in their areas of expertise, the guest instructors bring significant depth and real-world insight to the curriculum. Guest instructors change from module to module. Initially, the regional coordinator located and arranged for the guest instructors to come and team teach; however, that responsibility is now in the hands of the classroom teacher. In addition to employers represented by guest instructors, financial institutions and area law firms not directly involved in the program have partnered with the classroom teacher to provide a high-quality educational experience.

It took the classroom teacher and the guest instructors approximately one year to become acclimated to their new positions, and each year they become more experienced and knowledgeable about what does and does not work. For example, because of distance learning, students in this program do not take tests or turn in assignments at WWTC. They mail or fax their assignments to the classroom teacher or give them to their School-to-Work liaison. After a year of trial and error, the classroom teacher devised a system in which each student was given a manila folder containing tests, assignments, due dates, and an explanation of turn-in procedures for the entire semester. This method worked well and is still used. The guest instructors had to adapt to the distance-learning classroom. They had to become accustomed to being on television and knowing how loudly to speak and where to stand. As soon as the instructors

knew how the interactive television concept worked, they adjusted quickly.

Students interested in participating in the Finance Youth Apprenticeship program must complete an application, write an essay stating why they want to be in the program, submit three complete reference forms, prove they are academically on track for graduation, and have their parents write a letter explaining why they think their child should be in the program. The DWD advises against requiring a minimum grade point average to get into the program. The reason for this is to make the program accessible to anyone who is interested in applying. After turning in their application materials to the appropriate School-to-Work liaisons, students go through an interview process with representatives from interested financial institutions. The School-to-Work liaisons try to set up group interviews in which students from several schools are individually interviewed by a panel of bankers from different financial institutions. Generally, the financial institutions hold second interviews at the businesses before making final decisions. Selected students must work between ten and twelve hours a week their first year and between fifteen and twenty hours a week their second year.

Students in the program must maintain a 2.0 GPA. They are graded on their classroom performance and their worksite performance. The classroom teacher maintains grades for in-class work, homework, and exams. The worksite mentor is responsible for completing

## ***Student Qualifications***

competency performance checklists to record the students' training over the course of the program. These checklists use a rating system in which one (1) indicates familiarity with the process, two (2) indicates that the task has been performed but that additional training is required, and three (3) indicates an ability to perform entry-level skills independently. A worksite performance checklist includes all of the competencies identified by the curriculum writer in categories such as teller functions, account service, and consumer lending as well as punctuality, quality of work, and teamwork. Half the final grade in the class is based on classroom performance and half on worksite performance.

The state does not require students to take a comprehensive test at the end of the program. If a student achieves satisfactory scores on the competency checklists and on classroom work, completes the Finance Youth Apprenticeship program, and meets high school graduation requirements, he or she receives a state certificate called a Certificate of Occupational Proficiency.

***A minimum grade point average is not required for admission to the program, but applicants must have good references, must be on track for high school graduation, and must, through interviews and other means, demonstrate seriousness of purpose and a willingness to work hard.***

## ***Articulation***

Students who receive Certificates of Occupational Proficiency are eligible to receive “advanced standing” credits in related programs at all Wisconsin technical colleges. In Wisconsin, representatives from the state technical colleges collaborated to determine the minimum number of advanced standing credits to be granted to students for participation in youth apprenticeship programs. For example, Finance Youth Apprenticeship graduates receive a minimum of nine advanced standing credits when they enroll in a finance program at any Wisconsin technical college. However, individual colleges can negotiate additional credits. Each college also decides how to apply the advanced standing credits. Local and statewide articulation agreements are the mechanism by which advanced standing for youth apprenticeship programs is documented.

Most articulation agreements have stipulations. For example, in a relevant associate degree program, students must enroll within twenty-seven months of the completion of the youth apprenticeship program for the advanced credits to articulate. Students also receive high school credit for the classroom and worksite experiences in the youth apprenticeship program. By mutual agreement, state technical colleges honor each other’s agreements, so a student who leaves the western Wisconsin area can still receive advanced standing credit at another Wisconsin technical college.

## ***School-to- Work Liaisons***

Every school in the Western Wisconsin School-to-Work Consortium has a “School-to-Work liaison.” This person can be a school counselor, a teacher, or a principal. In the finance program, the liaison is the first point of contact for the students in the high schools and acts as a go-between for the schools and the worksites. This person keeps students and employers informed of changes, schedules, and program-related issues. The liaison is also the recruiter. It is up to him or her to talk to interested students and their parents and motivate people in the high school to promote the program. The liaison also makes sure applicants turn in application materials on time, conducts prequalification assessments of students, makes unqualified applicants aware of other options, and schedules interviews between students and participating financial institutions.

The School-to-Work liaison works with each student already in the program to develop a school and work schedule, meets with workplace mentors once a quarter to discuss students’ progress, and posts quarterly grades. The liaison is generally very knowledgeable about School-to-Work, youth apprenticeship, co-op, and Tech Prep programs.

## *Mentoring*

Mentors are a vital part of the Finance Youth Apprenticeship program. The state of Wisconsin requires mentor training, so the regional coordinator conducts an annual mentor/school liaison training workshop designed to explore the mentors' roles and responsibilities; demonstrate effective communication techniques, especially regarding constructive feedback; and explain the logistics, grading procedures, and methods of communicating with work and school personnel. The workshop also offers mentors an element of comfort as they begin to understand how the apprenticeship program works and what they need to do to make it a success.

Students are assigned mentors who work with them throughout the two years of the program. Mentors are responsible for showing the students around; acquainting them with staff, bank policies and procedures, and equipment; answering questions; and grading. Mentors also decide which employees will help train the students. Mentors must keep in touch with the students' classroom teacher and the School-to-Work liaison. Communication is facilitated by a weekly production report (WPR), which is used to record the competencies learned that week, problems encountered, and other relevant information. Students receive the WPR forms from the classroom teacher and must turn them in to the School-to-Work liaison every week.

Mentors are selected by people in supervisory positions such as bank presidents or managers. Mentors must be experienced

## ***Legal and Insurance Issues***

employees who are highly skilled in the different areas of finance and banking.

Many of the legal and insurance issues associated with the youth apprenticeship programs were addressed at the state level. For example, employers must comply with the Fair Labor Standards Act and federal and state child labor laws. However, there are exceptions for “student learners” who are enrolled in a course of study and training under a recognized state educational authority, and who are working under a signed Education and Training Agreement. A “student learner” designation allows students to leave school during school hours to go to work and to use certain types of equipment (with proper supervision and safety training) normally prohibited from use by people under a certain age. Because the Finance Youth Apprenticeship program does not involve dangerous work environments, the state only had to adhere to the number of hours and time-of-day restrictions applicable to the youth apprentices.

Transportation and liability issues were considered by the Western Wisconsin School-to-Work Consortium. While students are en route to school (both their high school and finance classes) and work, their parents are responsible for them. While they are at school, the school is responsible. When a student arrives at and begins working on the job, the financial institution is responsible. If anything happens to the youth apprentice while working at the job site, he or she is eligible to

receive workers' compensation, sue for damages, or take steps to obtain restitution for injuries received. An Education and Training Agreement form, which maps out the responsibilities of the student, the parent(s), the school district, and the employer, is signed before a student begins the program. Parent authorization forms are used to obtain permission for students to go on field trips or to other events outside the realm of school and work. This form is used for student transportation purposes as well.

The Western Wisconsin School-to-Work Consortium does not have a lawyer on staff and has had no need to retain one. People who have questions about insurance and/or liability usually consult their school district's legal counsel and the consortium's regional coordinator.

Marketing of the Finance Youth Apprenticeship program is accomplished in a number of ways. Typically, the School-to-Work liaisons, school counselors, teachers, or principals announce the program over the public address system, at schoolwide assemblies, or in classrooms. Ideally, someone would go into all sophomore classes and briefly explain the program and hand out relevant information. However, this option is up to the individual school; thus, if the principal, counselors, or teachers in the school have little interest in the program or School-to-Work in general, information may not get out.

Flyers can be a very effective marketing tool. The regional coordinator creates and

## ***Marketing***

disseminates flyers to schools, individual students, and school counselors as well as to School-to-Work liaisons. The regional coordinator also keeps schools stocked with fact sheets and current information and periodically asks staff members to distribute information about the program. The flyers developed for the Finance Youth Apprenticeship program are paid for out of the funds the consortium receives through the School-to-Work grant. The state of Wisconsin also markets School-to-Work programs through its Office of Public Information.

According to the regional coordinator, word of mouth is the best marketing tool. Students, employers, parents, teachers, principals, and counselors are all excellent spokespeople for the program. The Finance Youth Apprenticeship program also uses television and newspapers, but only for news coverage, not advertising. The regional coordinator alerts local television stations and newspapers of upcoming events such as graduation, the first day of a new program, or Education and Training Agreement signing ceremonies. On occasion, local papers have published lengthy articles about the Finance Youth Apprenticeship program.

***M***any powerful marketing tools are available, including television, radio, and various forms of printed matter. But word of mouth is the most effective.

## *Conclusion*

At first, many financial institutions were concerned about confidentiality and apprehensive about hiring sixteen-year-old students. But after only a few days, most of these students impressed their mentors and other staff members with their maturity, their ability to catch on quickly and manage busy schedules, and their professionalism. Furthermore, the students keep bank employees on their toes by asking questions and seeking assistance with homework assignments from finance class. Thus, having students at the worksite is not the problem many people feared it would be. In fact, the students have succeeded in providing quality service to bank customers and heightening the staff's awareness of bank procedures.

Each year, this program continues to evolve. New students enter the program, new volunteer instructors assist the classroom teacher, and there are changes in banking and finance. But this evolutionary process only serves to improve the Finance Youth Apprenticeship program. It keeps the curriculum up-to-date, makes the teachers more knowledgeable about the finance industry, and ensures that the students are very marketable employees. Moreover, with the help of distance learning, students in rural counties have had the opportunity to participate in a program that is unavailable at their schools.

The Finance Youth Apprenticeship program truly exemplifies successful partnerships and collaboration. The remarkable success of the program can be seen in the win-

win situation it creates: Students get the chance to learn new skills and begin careers, while financial institutions are given the opportunity to train future employees, motivate current employees, and create a highly skilled staff.

***T*** ***hese students impressed their mentors and other staff members with their maturity, their ability to catch on quickly and manage busy schedules, and their professionalism.***

## **Think About**

The concepts included in this section are provided to prompt you to think about what is most important when beginning a new program. Take time to consider what makes a program strong and why students would be interested in participating. Think about how students can gain experience from completing the program. Consider whether you have included components that are beneficial to everyone involved—students, teachers, and employers.

As mentioned in the introduction, there are basic areas—funding, legal issues, and staffing, for example—that must be investigated before the development phase of a new program can begin. The concepts and questions included here highlight the importance of addressing those issues and, in so doing, provide steps toward the implementation of a new program.

***Consider the problem that a new program should address.***

What is the need for starting a new program? Has business expressed the need for a more qualified workforce? Do students need to be challenged beyond merely observing/working at a job site? What student population would be included? Everyone? Are businesses available that would support a new program? Is your faculty prepared and, if so, willing to help? As a school representative, are you prepared to present Tech Prep and School-to-Work concepts to business representatives?

***Funding is an issue that must be considered prior to any planning activities.***

How will your school obtain funding for the start-up and maintenance costs of a new program? Consider whether local businesses would contribute to the program. Be prepared to explain how they can benefit from being part of the program. (Remind them, for instance, that the students they are willing to train today will be qualified to serve them well as employees in the future.) Are on-campus facilities available and ready to be used? If not, consider how this will affect the start of a new program. What new equipment must be purchased? Will staff training be needed? Is local and/or

state funding available? Is there a staff member who is familiar with locating funding opportunities and writing grant proposals for those funds?

***Consider what staff will be needed to help brainstorm, develop curricula, and inform students.***

In considering the most appropriate staff to recruit, determine how your new program will be structured and the demands it will make on the teachers involved. The teachers selected must be willing to work long hours to develop curricula and to meet with other teachers for planning. The staff must also be flexible, creative, and willing to try new teaching methodologies and to teach with new learning tools.

Consider whether the teachers have any other work experience that might contribute to course development and teaching strategies. Do these teachers have business contacts from whom they might receive outside training?

Will business representatives come into the classroom to teach? If so, consider how these outside teachers might be selected. What requirements (e.g., state certification) will they have to meet to be able to spend time in the classroom?

Counselors play a key role in the success of a new program as well. They must be informed about all aspects of the program so students are informed and get the opportunity to enroll. A sound marketing plan depends on counselors being well supplied with up-to-date information on the program. By word of mouth, they can help students take an interest in new program opportunities.

***The organization of an advisory committee is strongly recommended to help in decision making; it can be beneficial during the organization and development phases.***

The people who make up the advisory committee should represent varied backgrounds; diversity on the committee contributes to balance in decision making. Thus, it is a good idea to appoint a heterogeneous group made up of business representatives, teachers,

administrators, counselors, students, and parents. Does your school already have an advisory committee with members from the community whose services could be used? Consider the criteria that will be used to select members from the community to sit on this committee. Also consider the goals and philosophies of the program; make sure these ideas are made clear to each member. In selecting your committee, consider how much time members will be able to devote to their responsibilities. Also, think about what their responsibilities will be. How much authority will members be given? How often will the group meet?

***After working through structural issues, consider whether enrollment in the new program will be open to all students or limited to students who meet certain requirements.***

Think about generally recognized characteristics of a good student, such as having good attendance, earning good grades, and being on track for high school graduation. Now, consider whether these criteria will be used to determine whether or not a student is accepted into your program. Do these characteristics fit the student population you work with? What are the needs and abilities of a typical student in your school? This is an area in which the advisory committee can provide advice concerning what they consider important characteristics. In developing student acceptance and performance criteria, the advisory committee helps counselors select students for and introduce students to the program. How early will students begin applying for places in the program (i.e., end of school year for the next school year, mid-year for the next year)? Think of ways to recruit students into the program. How will you pique a student's interest about the program? Through counselors? Teachers? Flyers around school?

***One of the most important steps in program development is determining which curriculum to use: Will existing materials be used or will new ones be developed?***

An ideal time to discuss curriculum issues is when considering which staff to involve. The staff will play an important part in

selecting an existing curriculum or writing new materials. Think about whether the new staff members will be motivated to take on an endeavor like writing a curriculum that meets the needs of the new program. In deciding curriculum issues, consider how best to serve the students in the program. How will students react to a hands-on, project-based instructional approach? Will they become more motivated through the interaction of in-class demonstrations and group learning? Having considered that, think about what curriculum will meet students' needs. When organizing a new program, some educators pull concepts from various sources. For example, in the past, educators have written lesson plans using concepts from existing materials (e.g., concepts from a physical science course already in use) and incorporated those ideas into new materials (e.g., CORD's *Applications in Biology/Chemistry*). Whatever the approach taken by your school, make sure you allow enough time for the teachers to develop lesson plans.

***Consider legal and liability issues and how they must be addressed prior to the start of a new program, especially if the program is an apprenticeship and/or involves worksite learning activities.***

Any time a student for whom the school is responsible is taken out of the classroom and placed in a workplace, many legal and liability issues must be addressed. Who is responsible for the student at the worksite? If a student is injured at the worksite, who is liable? What kind of equipment will the student be working with or around, and how does that affect liability issues? Consult legal representatives and members of the advisory committee on issues such as students driving to the worksite or being bused during school hours. What restrictions are placed on what a student can experience while at the worksite because of age? What liabilities does a business face by allowing students to observe/work in its facility? States differ in what they will and will not allow a student to do at the worksite. For more information on work restrictions, visit the U. S. Department of Labor's web site (URL provided in the appendix).

## Glossary

This glossary provides definitions of key terms used in this report. Please note that the definitions may not match exactly the terminology as it is used in your consortium/partnership. This section also lists URLs for web sites that provide additional information on starting a program.

### *Applied academics*

The presentation of subject matter in a way that integrates a particular academic discipline (such as mathematics, science, or English) with workforce applications (hands-on laboratories dealing with practical equipment and devices).

### *Articulation*

A process of linking two or more educational systems in a community to help students make a smooth transition from one level to another without experiencing delays, duplication of courses, or loss of credit.

Types of articulation:

2+2—Two years of high school plus two years of postsecondary education

4+2—Four years of high school and the first two years of postsecondary education

4+2+2—Four years of high school, the first two years of postsecondary education at a two-year college, and two years at a four-year college or university

### *Consortium*

A stakeholder group of education agencies and organizations brought together for the development of applied curricula.

### *Contextual learning*

The instructional approach, underlying Tech Prep, that states that learning occurs best when students (learners) process new information or knowledge in such a way that it makes sense to them in their own frame of reference. This approach to learning and teaching assumes that the mind naturally seeks meaning in context—that is, the person’s environment—and that it does so through searching for relationships that make sense and appear useful.

### *Cooperative education*

An approach that involves a student’s working for a single employer, usually for pay, under a defined agreement with the school. It can relate closely to the occupational aspects of the student’s educational program. The work experience often lasts for months in a schedule that alternates worksite and school-based learning.

### *Dual system*

Workforce training (youth apprenticeship), commonly found in German school systems, in which classroom instruction is combined with hands-on vocational training.

### *Internship*

A flexible type of worksite learning that can involve varying arrangements with an employer. Its main goal is to give students and/or teachers practical experience in a specific field. An internship may be paid or unpaid, and can often last six or more weeks.

### *Job shadowing*

A practice that enables a student to explore a job or career area in detail for the purpose of helping the student choose a career and course of study. Job shadowing should occur in the eighth or ninth grade and can last as little as two hours or as long as two weeks at one workplace. A job shadowing experience consists of one or more students following and closely observing a worker as he or she goes about tasks at the worksite.

## *School-to-Work*<sup>11</sup>

School-to-Work Opportunities Act programs must include integrated school-based and work-based learning that integrates academic and occupational learning and links between secondary and postsecondary education; the opportunity for participating students to complete a career major; the provision of a strong experience in and understanding of all aspects of the industry a student is preparing to enter; and equal access for students to a full range of program components and related activities, such as recruitment, enrollment, and placement activities.

### *Tech Prep*

A sequence of study beginning in high school and continuing through at least two years of postsecondary occupational education. The program parallels the college prep course of study and presents an alternative to the “minimum requirement diploma.” A Tech Prep curriculum is built on a foundation of applied academics, prepares students for high-skill technical occupations, and allows either direct entry into the workplace after high school graduation or continuation of study that leads to an associate degree from a two-year college.

### *Youth apprenticeship*

A relatively formal worksite learning program in which employers agree to help develop students’ skills in technical areas and in related mathematics, science, communication, and problem solving. The students “learn by doing” in the workplace with the help of mentors. Qualified students receive recognized occupational credentials when they complete their programs.

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<sup>11</sup> Source: <http://www.stw.ed.gov/>

## **Web Sites**

U.S. Department of Education

<http://www.ed.gov/>

U.S. Department of Labor

<http://dol.gov/>

Funding

<http://www.ed.gov/money.html>

Goals 2000

<http://inet.ed.gov/G2K/>

Laws and Liabilities

<http://www.state.sd.us/state/executive/dol/dlm/kidswork.htm>

<http://www.llr.sc.edu/employee.htm>

SCANS

<http://pueblo.pc.maricopa.edu/MariMUSE/SCANS/SCANS.html>

School-to-Work

<http://www.stw.ed.gov/>

<http://www.ohio-stw.com/>

[http://www.austin.isd.tenet.edu/complan/school\\_wk.html](http://www.austin.isd.tenet.edu/complan/school_wk.html)

<http://esu15.esu15.k12.ne.us/~sch2work/home.html>

Tech Prep

<http://www.cord.org>

<http://198.78.178.196/Schools/NorviewHS/techprep.htm>

<http://vocserve.berkeley.edu/summaries/714sum.html>

<http://vvcrc.tec.va.us/TP/TPT/SP96/topSP96.html>

## **Related Sites**

“Creating Successful Workforce Preparation Programs”  
<http://www.fourhcouncil.edu/wfpres.htm>

“Developing Educational Standards”  
<http://putwest.boces.org/Standards.html>

“National Skill Standards”  
<http://www.nssb.org/>

“Occupational Outlook Handbook”  
<http://stats.bls.gov/cochome.htm>

“Occupational Employment Trends”  
<http://www.ajb.dni.us/almis/>

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