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ABSTRACT

More than half of current high school graduates do not go to college, and about two-thirds of high school graduates do not complete a college education. For these young people, as well as for the future competitiveness of the United States, a strategy to build bridges from school to work is needed. Four models have been suggested: youth apprenticeship, tech prep, career academies, and cooperative education, all of which are being implemented in various ways throughout the country. Eight principles are helpful to communities seeking to build high-quality school-to-work bridges and open multiple career paths for their young workers: (1) business as a major player; (2) community colleges in a pivotal role; (3) high standards for all students; (4) incentives for students to meet high standards; (5) career guidance, exploration, and counseling for all students; (6) integrated academic and technical learning; (7) integrated school-based learning with worksite learning; and (8) preparing students for two futures--(1) jobs requiring technical skills and (2) further learning, either job-specific training or four-year college. More than half of this document is comprised of the following information: descriptions of 9 current school-to-work projects, contacts for such partnerships, an annotated list of 12 sources of help, 9 references, a list of 10 national standards groups, and an annotated list of 27 documents that communities can use to begin raising academic standards and objectives for National Education Goal 5 which states that, by the year 2000, 'every adult American will possess the knowledge and skills necessary to compete in a global economy." (KC)

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ED 366 802

GOALS 2000
Educate America

Building Bridges From School To Work

BUILDING BRIDGES FROM SCHOOL TO WORK

A BACKGROUND PAPER FOR THE
GOALS 2000: EDUCATE AMERICA SATELLITE TOWN MEETING

April 13, 1993

Let's face it. Many young Americans who don't go to college are simply out of luck. Our high schools were designed to prepare students for *college*, not work. It's unclear -- most of all to these youngsters themselves -- how they're benefiting from high school, other than that it gets them a diploma.

Most American students about to receive that diploma, says the National Assessment of Educational Progress, read so poorly that they "appear to be at risk as they become adults." Other studies reveal something else about our approach to schooling. We're the only industrialized nation without a formal system for helping students prepare for work and enter the workforce.

The journey from school to work, for many young Americans, begins with several years of rough passage through a no man's land of low-paying, dead-end jobs. Employers are looking to hire mature individuals with work experience, not some kid fresh out of high school (or who dropped out of high school). The fact is, fewer than one in 10 large American firms hire new high school graduates. So it's no wonder that, according to Paul Osterman, one-third of our people fail to find stable employment by the time they reach 30.

Meanwhile, those same businesses, in pursuit of productivity and competitiveness, are taking the first steps toward transforming themselves into high-performance work organizations. Doing that, says David Stern, will "require workers at all levels...who can analyze data, communicate clearly, learn rapidly, participate in managerial decisions, and work well in teams."

By all indications, businesses are not getting an adequate supply of such highly skilled workers today. "More than half our young people," reports the U.S. Department of Labor, "leave school without the knowledge or foundation required to find and hold a job."

How can America develop the kinds of workers our businesses must have, if they're to create the kinds of jobs that *must* be created in order for America to compete in the 21st century?

That question is embedded in National Education Goals 3 and 5, which state that:

- "...every school in America will ensure that all students...may be prepared for responsible citizenship, further learning, and *productive employment* in our modern economy."

- "...every adult American...will possess the knowledge and skills necessary to compete in a global economy...."

One objective for Goal 5 is that "Every major American business will be involved in strengthening the connection between education and work." (Please see "Objectives for Reaching National Education Goal 5" for a list of the other objectives.)

Businesses, schools, postsecondary institutions, and others -- in communities across the country -- are beginning to form or expand school-to-work partnerships. What follows are some of the models they're building on, and principles they're using to guide their efforts.

FOUR MODELS

What's needed, many agree, are *multiple career paths* for the 75 percent of our young people who don't go to, or don't finish, college -- career paths that lead to high-skill, high-wage jobs. Multiple career paths ought to open up at least three opportunities for every young American:

- immediate employment in the student's chosen career area.

- further training or education that may lead to an associate degree or a baccalaureate (or advanced) degree.

- lifelong learning.

Hundreds of communities are starting to think about multiple career paths for all their youngsters. There are about as many kinds of approaches as there are communities working on it. But many who have studied the school-to-work transition for years agree: When planning to build bridges from school to work, a community may want to look at and learn from at least four models.

Youth Apprenticeships

Placing students in worksites -- at the elbow of a health professional, computer operator, machine operator, air conditioning technician, or another skilled technical worker -- is the hallmark of youth apprenticeships. More than the other models, this one emphasizes structured learning experiences in the workplace.

This model also requires much of businesses. According to *The School-to-Work Transition and Youth Apprenticeship*, no other model "even approaches the level of employer involvement implied by the youth apprenticeship model." Employers must play a central role in the designing and running youth apprenticeships. As a result, "Businesses think of their young apprentices as *their* kids," says Ricky Takai, acting Assistant Secretary for Adult and Vocational Education in the U.S. Department of Education. "They have an investment, a stake, in these kids."

While only about 3500 U.S. students were participating as of 1990, youth apprenticeship programs are springing up across the country. Legislation expected from President Clinton this spring would accelerate the youth apprenticeship movement and fuel the development of tech prep programs, career academies, and other models with more strucuted work experiences included.

Tech Prep

Tech prep programs are often referred to "2+2" because they often involve two years of high school and two years of postsecondary instruction. The idea is to "articulate" a sequence of courses that, over four years (or more), prepares students for a range of occupations within one industry. As stipulated by the 1990 amendments to the Carl Perkins Act -- which provided an infusion of support for the tech prep approach -- this sequence of courses is to include "a common core of required proficiency in mathematics, science, communications, and technologies designed to lead to an associate degree or certificate in a specific career field." Also under this federal legislation, tech prep programs coordinate and consult with local businesses and unions.

In a report this year, researchers Thomas Bailey and Donna Merritt state that "The tech prep strategy lends itself to the inclusion of a *work component*, although this component is not widely institutionalized at this point." As many as 100,000 students in the U.S. are participating in tech prep programs.

Career Academies

This model was originally designed to provide a focused, personalized learning environment for at-risk students in Philadelphia 20 years ago. Today, this model serves many middle- and high-performing students as well.

A career academy is often a school within a larger high school, where a group of students and a team of teachers stay together for a several-hour block of time each day. These students and teachers often remain together for three years. Instruction is focused on a single industry cluster. Teachers -- often one from English, math, science, and another subject -- design lessons that combine academic and vocational content.

In the 1980s, California used this model to create about 50 "Partnership Academies." Each is organized around an occupation or industry (health, electronics, or finance, for instance). Students work in that industry during the summer after their junior year and serve as interns during the second semester of their senior year. Businesses provide mentors, workshops, part-time jobs, and, when students graduate, full-time employment with career potential.

Cooperative Education

Participation in a cooperative education program lasts only a year or less, which is considerably less in duration than participation in other models. Often the arrangement between school and work is loose, less structured than under other models. Students may spend the morning at school and afternoons working at a local store or other business. They're often paid for their work, which is done to help students meet objectives spelled out in a written training agreement. This agreement also lays out the responsibilities of the student, employer, and the "coordinator," usually a vocational teacher. About 8 percent of American 11th and 12th graders participate in cooperative learning programs.

Local Needs

There is no one right way to ensure smooth passage for students into workplaces. Successful efforts are usually shaped by local conditions. After conducting extensive studies of school-to-work programs, Edward Pauly of Manpower Demonstration Research Corporation concluded that "the *best* programs adapt to take advantage of local resources and needs, piecing together study interests, organizational structures, curricula, and employer contributions that best fit with local circumstances."

Many outstanding school-to-work partnerships formed because *someone in the community identified a need*. The local vocational center in Mt. Vernon, Kentucky created its respiratory care program because the hospital nearby asked for one.

In El Reno, Oklahoma, people at the vocational school "realized that there was a community demand for training in child care," according to Linda Laverty, Coordinator of the Intergenerational Day Care Program. "Then they looked at the demographics and also realized that there was a need for *elderly* care." So they created a center where little children and senior citizens could be cared for together, and *be* together.

EIGHT PRINCIPLES

While no two school-to-work efforts are identical, experts have identified at least eight principles commonly found in successful ones. These principles -- and communities that are *doing* them -- may be helpful to other communities seeking to build high-quality school-to-work bridges and open multiple career pathways for their young.

1. Business as a major player.

After studying the school-to-work transition for 25 years, Paul Barton of the Educational Testing Service has "reached one strong conviction: the key...is a collaborative approach between the school and employers."

Collaboration involves more than donating computers, adopting schools, or arranging class tours of the worksite (though it may include such efforts). It means business and industry sitting across from educators as *equal partners* at the table to work toward mutual goals.

It also means business playing a pivotal role at every turn and in every dimension of the effort. In *School-to-Work Connections: Formulas for Success*, the U.S. Department of Labor says that, in successful school-to-work partnerships:

> "Employers contribute job-related criteria for inclusion in classroom curriculum. They provide on-the-job training, tours, presentations, practice job interviews...funding, mentors, supervisors, equipment, supplies...community contacts...and of course -- part-time and permanent jobs at non-subsidized wages."

Behind every effective school-to-work effort, there are committed business people. They're doing these things not out of the kindness of their hearts, but because they know that well-prepared employees are indispensable to the high-performance work organizations they want their companies to become.

That's why you'll see business people at work under almost all the other seven principles.

2. Community colleges in a pivotal role.

Community and technical colleges play key roles in the best school-to-work efforts. At minimum, they provide training and education beyond high school.

The Community College of Rhode Island (CCRI) spearheaded the creation of a tech-prep program six years ago. Designed as an alternative for high school students taking unfocused general education courses, the program involves 30 of the state's 39 high schools, as well as businesses. Among other things, CCRI organizes and coordinates *learning opportunities for*

teachers. CCRI recruits teachers from local high schools to conduct workshops and deliver in-service training for other high school teachers and counselors. The director of CCRI secured a small grant to help teachers collaborate in designing integrated curricula after school.

PACE -- the Partnership for Academic and Career Education at Tri-County Technical College in Pendleton, South Carolina -- goes directly to businesses and asks, "What kinds of positions need to be filled, and what kinds of students (entry-level workers) do you need to fill them?" It uses the answers to develop "teaching modules" that combine academic and career learning. One module, for instance, helps students see how algebra is used by engineering technicians; the module also shows the kinds of work that technician and the company do. PACE is also working with teams of teachers and business people to identify work-based competencies for grades 11 through 14.

In 1983, Portland Community College assembled 13 school districts to begin working on a regional tech prep effort. This consortium -- formalized in 1986 as the Portland Area Vocational Technical Education Consortium (PAVTEC) -- coordinates some 50 distinct occupational specialties in which 26 high schools offer instruction. A number of other state regions, including Southern Maryland, have emulated the PAVTEC model.

3. High standards for all students.

Low expectations beget low performance. No community wants that for *any* of its children.

That's why many are rethinking the practice of *tracking*. According to a report by the Southern Regional Education Board (SREB), some of the highest performing tech-prep schools in its State Vocational Education Consortium have eliminated tracking in one or more subjects:

> "Randolph County High School and Vocational-Technical Center in West Virginia dropped low-level English, general mathematics, and basic biology, and moved students into more advanced courses without significantly affecting failure rates. The dropout rate continued to decline, from...23 percent in 1986-87 to 12.6 percent in 1990-91."

Many -- including 15 sites in the SREB Consortium -- are also eliminating or phasing out the *general track*. Today, about one-third of American high school students take general track courses, which prepare students for neither work nor college. Says SREB, "students in 'general' programs take a random selection of courses that lead nowhere, exiting high school with a diploma that is practically worthless."

A tool communities can use to raise expectations for all students is national standards. Academic standards -- what all students need to know and be able to do -- are being developed for science, history, geography, civics, English, the arts, and foreign languages.

While they won't be completed until 1995 and 1996, *draft* standards for some of the subjects are now available. Also available are *reports* being used to inform and guide the development of these national academic standards. (See "National Standards Groups" for names and addresses of groups overseeing development of the standards, from whom draft standards may be requested. See "Documents That Communities Can Use to Begin Raising Academic Standards *Today*" for a selective listing of some of the reports being used to guide development of standards in each subject area.)

Also building momentum is a national movement toward skill or occupational standards for American industries. With support from the Departments of Labor and Education, efforts to hammer out what entry-level workers need to know and be able to do in 13 industries have just been launched. These standards are being developed for health and science technology; electronics (two efforts); computer-aided drafting; air conditioning, refrigeration, and power; biotechnical sciences; printing; automotive, auto-body, and truck technicians; industrial launderers; tourism, travel, and hospitality; metalworking; electrical construction; and retail trade.

Once standards are defined, assessments will be developed that will enable schools, communities, and employers to *certify* workers as prepared for jobs. Such performance-based certification systems can help businesses across America begin transforming themselves into high-wage, high-skill, high-performance work organizations.

Meanwhile, local certification efforts are bubbling up, as schools begin thinking about -- and companies begin developing their own -- workplace competencies and assessments.

Forty schools in Dade County, Florida are pilot testing a competency-based curriculum that draws heavily on SCANS -- the Secretary's Commisssion on Achieving Necessary Skills. SCANS workplace competencies include knowing how to allocate resources, communicate, process information, understand and use systems, and use the right technology to get specific jobs done.

Manufacturers, hospitals, and a life insurance company in Broome County, New York are defining what knowledge and skills their workers need to do their jobs. The county's youth apprenticeship program is using these definitions to determine what training students need during their apprenticeships. *Other* Broome County businesses are drawing on lessons learned about "defining workplace knowledge and skills" process. They're finding the process to be easier than did their predecessors. And they're discovering that it -- and the process of creating youth apprenticeships -- can help them move toward becoming high-performance organizations.

4. Incentives for students to meet high standards.

"What *difference* does it make how much I learn at school?"

Students may not ask it aloud, but they say it to themselves, for reasons that are understandable. Unless a student is vying for admission to one of America's 200 competitive colleges, there's little reason to sweat over schoolwork. There's no connection, as far as many students can see, between tonight's homework and the jobs they'll be doing in a few years. And while they can't *tell* you that over 80 percent of employers don't even look at high school transcripts when hiring high school graduates, teenagers have a sixth sense about it. Somehow, they know their grades and test scores won't mean beans to the boss signing their paychecks in a few years.

School-to-work partnerships can change this mindset. Academic and industry standards can be used for creating incentives that encourage students to get serious about schoolwork.

What kinds of incentives? Marilyn Raby, who helped direct the renowned California Partnership Academies, says businesses in Silicon Valley and all over California provide lots of things -- "mentors, speakers, field trip sites, and most important, *jobs* for our students."

Many school-to-work partnerships use jobs as a carrot. The Workforce LA Youth Academy in Los Angeles offers summer jobs to students who do well in school. A project in San Francisco, sponsored by the Bank of America, provides part-time and full-time jobs with career potential to high school graduates meeting entry-level competencies. Pasadena High School's Graphic Arts Academy *guarantees* a job for every graduate who chooses employment rather than postsecondary education.

A complementary approach is being pilot tested in Tampa, Florida. Working with the Educational Testing Service (ETS), schools are making student performance records instantly available to employers throughout the region, via an electronically searchable database. WORKLINK, as this joint project between ETS and the National Association of Secondary School Principals is called, is being tested also in Pasadena. The idea is to let students use their performance in school -- their grades, ratings by teachers, and more -- to demonstrate to employers regionwide their readiness for high-skill, high-wage jobs. This, communities hope, will send a clear message to students: that their school performance counts.

In Tennessee this spring, more than 37,000 high school seniors will be taking an employability skills assessment, "Work Keys." Developed by the American College Testing service, Work Keys measures student performance in relation to a half dozen employability skills, including reading, problem-solving math, listening, and writing. These skills have been verified as important by businesses, and students may carry the results when looking for jobs. Wyoming and Ohio are also using Work Keys to assess the employability skills of more than 100,000 students.

5. Career guidance, exploration & counseling for all students.

It's in everyone's best interest for students to select careers that make sense for them. Such decisions aren't made overnight. The National Tech Prep Network suggests what many believe -- that career awareness, exploration, and planning "should begin at the elementary school level and continue throughout the college experience." Objectives of this career exploration, says the Network, should include "familiarizing students with many different job/career options, providing information on what is required to be successful in the positions, and leading students to discover and explore their own interests and aptitudes."

To get children thinking about careers early, some communities are asking parents, business people, and others to make classroom presentations about their jobs. Many are asking local workplaces to serve as sites for field trips, so that students can see first-hand what people do at various jobs.

In Washington, D.C. retired scientists and engineers recruited by the Emeritus Foundation fan out into elementary schools to share their careers and knowledge with children. An electrical engineer, for instance, recently demonstrated how magnets and wires can be assembled to create electricity. He then took the class on a tour of a power generating station.

At Rindge School of Technical Arts in Cambridge, Massachusetts, 9th graders get an overview of automotive, carpentry, electronics, and other trades. Then they participate in three-week "exploratories" where they create a giant wall map of the Cambridge area, models of the facades of churches and monuments, and more.

In Baltimore's Project Mechtech, students rotate among participating employers to get training with manufacturing technologies in various work settings. In Maryland's Tomorrow, a program in rural Carroll County, students shadow professionals, visit companies -- and begin planning potential careers for themselves.

Internships and community service can open youngsters' eyes to career options around them. At LaGuardia Middle College High School in Queens, New York, students serve three internships before graduating, internships that are available at 350 sites throughout the city -- in doctors' offices, day care and community centers, elementary schools, businesses. "Not only do students get training," says Principal Cecilia Cullen. "They also contribute 200,000 hours of community service a year. They get the opportunity to see if they are interested in medicine, law enforcement, and other fields. And they mature tremendously."

6. Integrated academic and technical learning.

Hands-on learning works best for at least 75 percent of our students, according to research in cognitive science. Students learn more when they're asked to solve practical problems and perform real-life tasks. That's why teachers across the country -- teachers of all subjects, not just technical learning -- are beginning to focus the curriculum on what students *do*.

This kind of problem-driven, task-based, discovery-oriented instruction has always been a hallmark of vocational-technical education. At Northside Health Careers High School in San Antonio, students use geometry to design an orthodontic layout for braces and calculus to compute dissipation rates for various medicines in the body. An applied physics teacher in rural Oklahoma uses a *combine* -- a huge wheat-harvesting machine -- to introduce physics concepts.

Many teachers find a natural marriage between academic and technical instruction. Repairing an automobile engine, for instance, may require the use of algebra to determine the engine's size. Reading technical manuals and magazines can improve students' reading performance. Keeping a daily journal on what they're learning can sharpen students' writing and study skills. (The SREB report *Making High Schools Work* is loaded with additional examples.)

How do teachers manage this marriage between academic and technical instruction? It can begin when a math teacher sees a workplace task that illustrates a math concept that trips up students. Or when a technical teacher sees a need for students to better understand one of Newton's laws. Then academic and technical teachers start talking, and collaborating.

It began at Cedartown Comprehensive High School in Georgia when a committee of 15 vocational teachers and 6 math teachers spent several months matching math competencies from the college prep program with vocational programs taught at the high school. SREB's *Making High Schools Work* tells that the committee found hundreds of vocational tasks that require the use of those competencies.

How does this collaboration work, practically? At Salem County Vocational Technical School, when students turn in a report on hydraulics or electronic circuits, the automated technology instructor reads it for technical content; their English teacher grades it for grammar. When they study magnetism or kinetic energy, they learn by doing -- doing research projects, designing electrical systems, and trouble-shooting electrical circuits.

To facilitate collaboration among academic and technical teachers in its Public Service Academy, Anacostia High School in Washington, D.C. sets aside a *common plan time* for them. Teachers use this time to design integrated lessons -- for instance, having students use what they've learned about statistics to conduct and analyze polls and study the operations of local business.

Team teaching in Oakland's Health and Bioscience Academy helps students see the connections. When learning hand-washing techniques in biology lab, students read about bacteria in English class and get a lesson on an epidemic that made history. The "team of teachers" also includes experts from local hospitals who are brought in to train students in CPR, first aid, medical lab techniques, and more.

Business partners can contribute powerfully to the integration of academic and technical instruction. For one thing, they can identify tasks their employees do, problems they solve -- problems teachers might use to help students learn important concepts. "The more teachers can link their lessons and materials to actual work-site experiences," says *School to Work Connections*, "the more likely it is that programs will be successful."

Businesses can also help ensure that training in school is up-to-date. The Electronics Industry Foundation is working with schools to redesign "electronics technician" training around state-of-the-art, world-of-work applications. To do so, it is bringing scientists, engineers, and technicians from the electronics industry together with math and science teachers, both at worksites and in the classroom.

How can teachers get help from businesses? The experience of Steve Piippo at Richland High School suggests that one way is simply to *ask* for it. His Material Science and Technology got started...

> "about seven years ago when I was teaching an old-fashioned materials course. Students were asking why certain materials behave certain ways -- Why is glass brittle? Why does metal stretch? These were pretty sophisticated questions that I needed help answering. So I contacted Battelle Pacific Northwest Laboratories. Battelle has an entire group of materials people. That led to a partnership, and from there the curriculum has continued evolving."

The partnership for Piippo and his students continued growing and today includes Boeing Commercial Aircraft Corporation, Corning Glass, NASA, local industry, the community college, and the university.

7. Integrate school-based learning with worksite learning.

School-to-work partnerships are tightening the link between what students learn at school and at worksites. This often means, among other things, increasing the time students spend in structured worksite learning.

In Oakland, educators and industry representatives are designing on-the-job, work-based instruction to be woven into curricula of the city's four Partnership Academies.

Seminole County School District in Lake Mary, Florida is creating an "Electronics within the Telecommunications Industry" youth apprenticeship program on its existing tech prep program. Siemens Stromberg-Carlson, a partner in these apprenticeships, is paying students to learn at its work-sites.

Under Pennsylvania's new metalworking youth apprenticeships, students are spending 50 percent of their junior year and 75 percent of their senior year learning at work. And they're being paid a training wage by participating firms.

In Toledo, the Private Industry Council has pulled together occupational planning teams to develop curricula and work-based learning that zeros in on employer-certified competencies. An occupational specialist ensures that everything -- applied academics, work-based learning, and paid work-site training -- fits together to equip young apprentices with the intellectual tools they need.

8. Prepare students for two futures: jobs requiring technical skills and further learning, either job-specific training or four-year college.

No one wants to see students lock into career paths without the possibility of switching. That's why more school-to-work efforts are being designed to prepare students not only for a job, but for further technical learning, as well as the pursuit of baccalaureate and even advanced degrees.

Oregon passed legislation in 1991 requiring all students to demonstrate competence in mathematics, science, reading, and other subjects *by the 10th grade*. Upon doing so, a student earns a Certificate of Initial Mastery (CIM) and makes a decision: whether to prepare for college or for a high-skill technical occupation. A student who chooses occupational preparation may switch to the college track at any time, and vice versa. But by having earned their CIM, students who switch will have the fundamental skills to succeed whether they go to college or directly into the workplace.

Boston's ProTech program features a "postsecondary support system" that helps students get into college and succeed there. Students are required to take two college courses while still in high school, so that they get a taste of college expectations and the environment. ProTech also provides college-readiness workshops, assistance with financial aid and applications, career and college counseling, and more.

Other communities help students see -- and prepare for -- their options in a variety of ways. For six weeks during the summer, high school students in Southern Maryland spend 20 hours a week working in three hospitals. They earn college credit for studying another 20 hours a week in classes taught by faculty from Charles County Community College and other health professionals. Students are paid for a full 40 hour week. During the school year, they're paired up with a mentor from the hospital, where many stay on as volunteers or part-time workers.

Getting students ready for postsecondary education is central to the mission of Oakland's Health and Bioscience Academy. More than 80 percent of its graduates meet the University of California's rigorous admission requirements, compared with less than 20 percent of the Oakland School District's graduates.

Other California Partnership Academies are also strong on getting students ready for formal learning beyond high school. About two-thirds of the graduates of these 50-some Partnership Academies go on to postsecondary education.

At the Academy of Finance in New York City, all seniors take a college-level course, often at a local college. That's one reason nearly 90 percent of its graduates go on to college.

CONCLUSION

These are some ways communities are helping their young people gear up for high-wage, high-skill jobs -- and lifelong learning.

Communities see this as *more* than just an education issue. It's about equity -- extending the promise of America to all our people. And it's about our economic future. Developing the potential of our children today, we all recognize, will shape our communities and our country for years to come.

On the pages that follow you'll find information that may be helpful as your community begins building or expanding its school-to-work partnership. This information includes:

- Promising Projects -- What a few schools and communities are doing to open multiple career pathways for their young.
- Contacts for School-to-Work Partnerships -- Individuals who are involved with projects and partnerships mentioned in this background paper.
- Sources of Help -- Organizations that can help a community design, implement, or improve a school-to-work partnership.
- References -- Reports that helped shape this background paper.
- National Standards Groups -- Organizations that are leading a national discussion and overseeing the development of national standards for seven academic subject areas.
- Documents That Communities Can Use to Begin Raising Academic Standards *Today* -- Reports and frameworks that are being used to inform and guide the development of national standards in each academic subject area.
- Objectives for National Education Goal 5 -- Objectives that were part of the 1990 National Education Goals agreement.

PROMISING PROJECTS

ProTech Health Care, Boston, Massachusetts

After her morning in class studying English, algebra, and physics, Sylvia rides the bus to Deaconess Hospital. There, under the watchful eye of a hospital technician, she takes bone and tissue samples of patients, slices them into razor-thin strips, attaches them to slides, and checks the numerical coding to be sure each slide matches the right patient.

Like 120 other students from three Boston high schools, Sylvia is preparing for high-demand technical occupations in Boston's health care industry. It's made possible by ProTech Health Care, a new youth apprenticeship program. Now in its second year, ProTech's enrollment has already more than doubled.

In each year of the program -- from 11th grade through two years beyond high school -- students spend time learning in *hospitals*. A specially designed hospital-based curriculum offers everything from introductory health care courses to *clinical rotations* at one of the seven participating hospitals. These work-learning experiences let students explore a range of occupations -- and related knowledge and skill requirements -- within the health care industry.

High school teachers involved in ProTech modify science and English courses to reinforce what students learn in the hospital. Hospital staff serve as mentors for ProTech students, providing them with role models and assistance in learning and understanding the work culture of a hospital environment. ProTech students "learn by doing" at the hospital, through paid part-time jobs during the school year and full-time jobs during the summer.

A partnership coordinated and managed by the Boston Private Industry Council, ProTech Health Care appeals particularly to a certain kind of student -- one who isn't sure about his or her career goals, but who is eager to work. For these students, ProTech provides a good hard look at what their futures might be.

Contact:
Lois Ann Porter
ProTech Project Director
Boston Private Industry Council
2 Oliver Street
Boston, Massachusetts 02190
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Broome County Youth Apprenticeship Demonstration Project, Broome County, New York

Students in Broome County, New York are spending up to 15 hours a week doing hospital lab tests, helping with group insurance policies, operating machinery, and more -- while carrying a *full course load* in high school. They're doing it through Broome County, New York's Youth Apprenticeship Demonstration Project.

During their four-year apprenticeships, students explore a variety of positions within the hospital, manufacturing plant, or other business they choose. In the life insurance company, for instance, apprentices do *rotations* that include group policies, accounting, and sales. After graduating from high school, students continue their apprenticeships while studying for at least two years at a community college.

Many of these young apprentices are becoming more mature and responsible as a result of their work experience, according to parents and teachers. Challenges in the workplace seem to encourage kids to push themselves academically. Many say their grades have risen.

These apprenticeships are helping many students develop a stronger sense of their career options. Project Director Stephen Hamilton says kids "have a better knowledge of what's out there, and what they have to do to *get* there."

Supervisors of apprentices are seeing spillover benefits. They're finding that teaching an apprentice can help them clarify their thinking about how their *own* jobs can be done more effectively. Using detailed forms in evaluating students is helping some supervisors develop better benchmarks for assessing the skills and progress of *experienced* workers. Some older employees are being inspired by students to take advantage of training opportunities. "Firms can use youth apprenticeships," says Hamilton, "as part of a stragtegy to become high performance workplaces."

Hamilton and his staff help businesses identify specific skills and behaviors their workers need. Teachers have visited businesses and met with employer groups, which gives them a clearer sense of how students will be asked to *apply* academic skills. Seniors integrate academics and work experience by researching an issue in their workplace and develop a presentation, with the help of a teacher and their workplace supervisor.

Enthusiasm about apprenticeships among students and businesses is growing. Hamilton hopes to *double* the number of students participating next year. Ideally, says Hamilton, apprenticeships should be part of a career awareness, counseling and training program that begins when children are young, so they have a better sense of opportunities and options by the time they are old enough to begin internships.

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Craftmanship 2000, Tulsa, Oklahoma

Leaders of metalworking firms in Tulsa a few years ago decided that they weren't getting enough well-prepared young workers. So they got together to try to answer a question: How could they take an untrained 16-year-old youngster and, by the age of 20, turn him into a master craftsman?

They contacted members of the vocational/technical school board, who were surprised to learn of their interest in education. Previously in Tulsa there had been little contact between schools and business.

Technical instructors from the high school and the community college sat down with these business leaders to develop a profile of the kinds of students and entry-level employees they wanted to produce. The business leaders were surprised to find disagreement among themselves, which they worked out. And that led to the creation of Craftsmanship 2000.

A four-year youth apprenticeship program in metalworking, Craftmanship 2000 combines academic, technical and work-based training. Students do coursework at Tulsa Vo-Tech High School and at Tulsa Junior College. They serve apprenticeships in a metalworking firm, beginning in their first year. Upon completing the program, students receive a high school diploma, an associate degree in metalworking, and certification for skilled employment in the metalworking industry.

The curriculum is what drives Craftmanship 2000. Teachers and industry people devised it specifically to prepare highly skilled workers for the challenges of the metalworking. "We took all the elements that already existed in the community, and moved them all into one arena," says Rowley. "In the process we raised the expectations to a level where you can challenge the kids. They will rise to it," Rowley continues, "but you have to challenge them first."

To participate, students must sign a four-year commitment. They must also spend eight hours a day and 220 days a year learning -- considerably more than the six-hour days and 175-day years their peers spend in school. Students grumbled about that initially, but the paid apprenticeships -- for every student, for four years -- made it palatable. In fact, Craftmanship 2000 has been so successful that similar partnerships for the aviation and health care industries are now being planned in Tulsa.

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Material Science and Technology Program at Richland High School

It began when students in Steve Piippo's materials course began asking questions about "why certain materials behave certain ways -- Why is glass brittle? Why does metal stretch?"

Piippo needed help answering these questions, so he contacted Battelle Pacific Northwest Laboratories. Battelle, he discovered, has a whole team of materials people. "That led to a partnership," Piippo remembers. "And from there the curriculum has continued evolving" into the course Piippo teaches today -- Material Science and Technology (MST).

In MST students use technology, chemistry and physics, engineering and mathematics to *discover* the nature and properties of ceramics, polymers, and other materials. They blend chemicals to make glass materials and nylon. They even learn how to make a superconductor from scratch.

Important to lab work is each student's *lab journal*. Modeled after what engineers and scientists use, this journal chronicles all the student's work -- lab experiments, insights, and real-world connections they uncover when studying various materials. This journal accounts for 50 percent of the student's grade.

In addition to learning in class, students tour labs at Boeing Commercial Aircraft where aircraft materials are developed, and Sandvik Metals, where they see how nuclear field rods are made. Students also participate in a science fair, hear guest speakers, and more.

MST graduates are ready to pursue multiple paths. They may go on to a four-year college, continue their studies in two years of technical training, or enter the workforce immediately following graduation. Since 1986, more than 600 students -- including many who go on to college -- have taken the course, which is approved as a full-year class for both a science and technology credit.

"Materials science technology," says Piippo, "is now being viewed as the *introductory* science course that truly bridges science education and technology." During the past four summers, 35 high schools in Washington have sent teachers to Richland to learn how to use MST in their schools.

Battelle Pacific Northwest Laboratory has continued to support the MST course, and business and industry links have been established with Bethlehem Steel, Corning Glass Works, ALCOA, and Phillips 66 Petroleum Corporation.

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Health and Bioscience Academy, Oakland, California

"Being in our program," says Pat Clark, teacher and co-director at Oakland's Health and Bioscience Academy, "changes everyone involved. It isn't just about work. It's about citizenship and involvement. It's a way of life."

The 9th graders that Clark and others recruit into the Academy are often what Clark calls the "disenchanted." They've lost the "enchantment of education"; many have probably considered dropping out of school. The Academy's school-within-a-school, family-type atmosphere re-engages these students. So does the *instruction*, which is relevant, challenging, hands-on, problem-based, and interdisciplinary. The mentors, health professionals, and undergraduates that teachers provide for students also help.

As sophomores, students take field trips to various businesses and volunteer in hospitals or community-based clinics and other organizations. Students and their families attend plays, movies, and other cultural events, expanding students' world beyond just school and the workplace. The summer after their junior year, students begin paid internships.

Students compile their work at school and on the job in portfolios. They also research and present a "culminating community-based project" focusing on a health issue in their community. Two students who produced a photographic essay on the homeless spent the night in a homeless shelter and wrote a major report on health problems homeless people face.

According to Clark, academy teachers "take what is done in the health and science professions and infuse it into the curriculum." Teachers worked closely with local colleges and health professionals to design the course curriculum. College textbooks are often used, and *college credits* can be earned in anatomy and physiology. "The only thing we're missing," says Clark, "is a cadaver lab."

More students from the Academy are going on to college than even Clark had expected. In 1985, the Academy's first year of operation, 80 percent of students in the Academy met the entry requirements for the University of California system, compared with only 42 of the 55,000 high school students in Oakland. "The secret of our success," says Clark, "is having wonderful students and giving them real-life projects. There is a lot of joy here."

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Louisville Education and Employment Partnership, Louisville, Kentucky

In 1990, the City of Louisville joined forces with the county government, public schools, private industry council, and chamber of commerce to create a combination dropout prevention/school-to-work program. The "Louisville Education and Employment Partnership," as it's called, provides job training, summer enrichment, employment opportunities, mentors, and more to some 1500 high school students in Louisville.

A Career Planner in each high school recruits and advises Partnership students, usually in the ninth grade. To participate, students must agree in writing to attend school 95 percent of the time, improve their grade point average, participate in the program's offerings, and graduate from high school. Partnership students do remedial and enrichment work on special computers in the Career Planner's office. They also participate in summer programs. Other services and programs, such as mentors and apprenticeships, are optional.

Pat Pearson, a Career Planner at Moore High School, is making sure that all 50 of her Partnership students have plans for the summer. Some will visit businesses and get additional computer-assisted instruction as part of an enrichment program. Students who read well will tutor and read to other kids. Those who are failing any classes will attend summer school in the morning, and spend their afternoons working in part-time jobs secured through the Partnership.

Partnership students flow in and out of Pearson's office throughout the day. All of them come in at some point in the week to practice their math and English skills on the Computer Curriculum Corporation system. Others stop in to say hello, or look for advice on personal, family, or job problems.

The Jefferson County Public Schools Research Department evaluates the progress of Partnership students each year. Over the past four years, students in the program have shown steady increases in math and English grades, and many who might have dropped out of school are choosing to stay. Pearson says students show the most improvement at the end of their sophomore year -- after two years in the Partnership. "If a student stays in for all four years," she says," they're going to be *good*."

Each Career Planner works with Parnership students to develop interview and workplace behavior skills using Partnership's Pre-Employment Work/Maturity Skills curriculum. Pearson meets with local businesses twice a week to discuss job opportunities for her students and to find out what skills employers need in young workers, or where her students need extra help. The most common complaint, she says, is that students lack basic math skills. Students who want extra practice in math often come in on their own to use the computer system in Mrs. Pearson's office.

The Partnership provides students with guidance, support, and jobs. Local businesses, including National Processing and UPS, are offering jobs and scholarship money to Partnership seniors. In order to ensure access to higher education, Pearson and other Career Planners help students and their parents fill out financial-aid and scholarship forms.

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Community College of Rhode Island 2+2 Tech Prep/Associate Program, Warwick, Rhode Island

Designed as an alternative program for "general track" and vo-tech students, the 2+2 Tech Prep/Associate Degree program was established in 1987 at the Community College of Rhode Island (CCRI). Today, 30 of Rhode Island's 41 high schools -- and more than 1,000 students -- are participating.

It begins in the 11th grade, when students enroll in a core curriculum in Principles of Technology (science), math, and communications -- all taught in an applied setting using a hands-on, practical approach to learning. This curriculum prepares students to pursue a postsecondary technical training program and, subsequently, a career in a technical field.

CCRI offers a number of activities to high school students in the 2+2 program. Students visit CCRI several times throughout the year to learn more about the technical, business, and allied health options available to them now and upon completion of the program. They get to sit in on CCRI classes and meet with students who are in the postsecondary part of the program. They also meet with meet with business and industry representatives to discuss career opportunities.

Students who successfully complete the high school portion of the program are guaranteed acceptance into the technical programs at the CCRI. The program culminates with an associate degree at CCRI. Approximately 85 percent of the high school students in the 2+2 program go on to some type of postsecondary education.

One of CCRI's roles is to organize and coordinate training and learning opportunities for faculty and teachers. CCRI selects teachers from individual high schools to conduct workshops and in-service training for teachers and counselors at the high school level. One focus of this training is the integration of academic and vocational learning. In several high schools, *teams* of academic and vocational teachers work together to develop integrated curricula. To assist teachers in this area, the director of the 2+2 program wrote and received a small grant which provided teachers with a small stipend to work together after school to develop integrated curricula.

The 2+2 program is fostering a partnership between CCRI and local businesses. Metropolitan Life, a large insurance company in Rhode Island, provides mentors, guest speakers, tours, and summer employment for students in the 2+2 program. Cherry Semi-Conductor, an electronics firm, and Foxboro, a chemical technology company, offer technical assistance, guest speakers, and business site field trips. Other local employers host on-site tours, provide summer internships (using federal Job Training Partnership Act funds) and postsecondary cooperative education programs, and meet with students to talk about electronics, pharmaceuticals, and other industries and career opportunities within the state.

CCRI is looking forward to expanding its community links, and is currently working with members of the business community to explore piloting a learning center in one of the community malls.

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Cambridge Rindge and Latin School, Cambridge, Massachusetts

The Technical Vocational Program was seen as a *dumping ground* for students who had difficulty keeping up in the traditional classroom. That changed two years ago when a new principal came in and launched the overhaul of the program at Cambridge Rindge and Latin High School.

The name was changed to the Rindge School for the Technical Arts (RSTA). The old machine shop was renovated. Smaller studios were built, so students could work in small groups, making communication and team work essential. Teachers organized the renovation; students did the painting and electrical work. Old shop equipment was sold off to help defer the costs.

Then the "City Works" program was designed for all incoming freshman to forge links between vocational education and community economic development efforts. In City Works, 9th graders spend one period every morning learning how what they're studying relates to the city. The program has three parts: Walk-Around-The-Block, Three-Week Exploritories, and Community Development Projects.

City Works

Students form teams, each assigned a different block in the neighborhood adjacent to RSTA, to *walk around the block*. They fan out through the neighborhood, collecting physical and demographic information about it. They draw diagrams, measure distances, take photographs, ask passers-by questions and then bring that information back to school. There, each team presents its findings, its "story of the neighborhood."

"A lot of the students do not see the connection of academics to the real world," says counsellor Adria Steinberg. They discover those connections in Walk-Around-the-Block. They also learn to observe, analyze, and communicate their findings. "In the process, they find out what it is that *makes* a neighborhood -- and what it is that interests them."

"Three-week exploritories" focus on different aspects of the community. Students work together on projects in their "studios," where they learn to communicate ideas and work as teams. They compile portfolios, deliver oral histories, create three-dimensional models and maps, and re-create building facades, all using Cambridge as the focal point.

For their "community development" project this spring, students are developing plans for a Cambridge Exploratory Museum. This involves locating a site for the Museum, designing the facade and structure, and creating physical exhibits. The project forces students to draw on many vocational arts -- carpentry, electrical engineering, graphic design, and more. And this project represents the philosophy of RSTA, as well as Cambridge Rindge and Latin School: engaging students as *actors* in their own community. Getting them to examine their neighborhoods, assess community problems, and identify solutions together as teams.

City Works also provides internships with Lesley College, a teachers college, and paid apprenticeships with the Polaroid Corporation. Polaroid has also donated supplies and equipment.

City Life, City Systems

City Works is followed every day by two periods of City Life, where world history, literature, and languages related to the development of cities are discussed. Students learn how early settlements evolved into modern cities.

City Life is then followed by two periods of City Systems, where related concepts of algebra and pre-geometry, scientific principles and pre-engineering, and others are discussed. Themes for the year include measurement, systems, and ecology of the city.

While the results of the program will not be conclusive at least until the first ninth grade class finish the program, signs thus far are overwhelmingly positive. As a school within the 2,400 student Cambridge Rindge and Latin School, RSTA is now attracting the interest of more high-performing students, which is enhancing its image and boosting the confidence of participating students. Parents are starting to get involved. And for the first time, RSTA students entered projects in the school-wide Science Fair. "They won some ribbons," Steinberg says. "That was unthinkable a few years ago."

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Pennsylvania Youth Apprenticeship Program

The Pennsylvania Youth Apprenticeship Program (PYAP) brings together community, business, and educational institutions to provide students with a smooth transition from high school to higher education and employment.

PYAP is based on the findings of a study team led by the Pennsylvania Department of Commerce. The team examined how worker preparation strategies used in several European nations could be adapted to the needs of Pennsylvania. The team concluded that while the European systems could not be replicated exactly in Pennsylvania, several key elements of those systems could be used as guiding principles for a Pennsylvania youth apprenticeship system. Those elements included: "(a) using the workplace as a learning center and integrating school with work; (b) giving employers, educators and workers joint ownership of the system; (c) measuring outcomes in terms of common standards of proficiency; (d) emphasizing flexibility and 'learning to learn' skills; (e) integrating secondary and post-secondary credentials; and (f) promoting the value and status of manufacturing employment."

Following the recommendations of the study team, a pilot project was begun in metalworking in 1991 in Lycoming County with 12 students. In September of 1992, five additional metalworking projects were begun, including in Philadelphia and Pittsburgh. Currently, a total of 101 students and 76 employers are participating.

Students enroll as juniors and, during the first two years, attend school three days a week and work two days per week. At each project site, students from different high schools study together at a central "host school" under the direction of a team of teachers that includes an English, science, math, social studies, and vocational teacher.

Students are paid an average of $5 an hour for their work and learning at the worksite. A common training program developed by the employers is used at all sites, although apprenticeship experiences vary according to site and employer. It includes 5,050 hours of training in basic and advanced shop practices and tool room skills. The training is spread over four years, with the first 1,550 hours occurring in the junior and senior years of high school. Students work under a mentor designated by the employer. In addition, a cooperative education teacher works with the student's mentor to ensure that the student receives appropriate training. This teacher is also a member of the school-based teaching team and thus serves as a bridge between the student's school and work experiences. The worksite training is well-coordinated with the technology component of the high school curriculum.

Training in the first two years is broad-based, with more specialized training following in the third and fourth years. At the end of the second year in the program, students receive a high school diploma and continue in the program while taking associate degree courses at a community college. They may also enter a formal adult apprenticeship program upon reaching age 18. At the end of the fourth year they are ready for employment in the metalworking field, or they can either complete a traditional metalworking apprenticeship program or continue postsecondary study at a four-year college.

At each of the six sites, projects are driven by *stakeholders groups* -- local coalitions of community, business, education, and government representatives. These groups determine how the program will be developed and implemented in a way that best meets the goals and needs of that particular area. The stakeholders groups work closely with the PYAP's regional project managers.

Other key PYAP components are being developed. The program uses assessments that include *portfolios* of students' work, both from school and from work. Ties to community colleges are being formalized in agreements that articulate how students will move from high school to postsecondary study. Certification for successful completion of the program is also being developed. In addition, efforts are being made to increase the involvement of organized labor in the program.

PYAP is growing. For the 1993-94 school year, 12-20 additional sites will be added with funding provided by the Pennsylvania Department of Education. These sites may develop youth apprenticeship initiatives in fields other than metalworking. They will use the same integrated academic/work-based learning/team-teaching concepts used in the demonstration models. Pennsylvania's goal is that the PYAP program will evolve into a statewide system of youth apprenticeships -- a system that provides students with the integrated education necessary to be highly productive workers in an ever-changing economy.

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CONTACTS FOR SCHOOL-TO-WORK PROJECTS

Following are projects that inspired -- and are mentioned in -- this background paper.

Academy of Finance
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American College Testing -- Work Keys
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ACT Center for Education and Work
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P.O. Box 168
Iowa City, Iowa 52243-0168
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California Partnership Academies
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Also:

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Cedartown Comprehensive High School
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Community College of Rhode Island
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Secretary's Commission on Achieving Necessary Skills (SCANS)
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Electronics Industry Foundation
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Emeritus Foundation
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Intergenerational Day Care Program
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Northside Health Careers High School
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Oakland's Health and Bioscience Academy
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PACE (Partnership for Academic and Career Education)
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Tampa, Florida
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Tech Prep Plus
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Toledo Private Industry Council
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Workforce LA Youth Academy
Mr. Jim Konantz, Director
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Division of Adult Education, Career and Child Development
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SOURCES OF HELP

American College Testing
2201 North Dodge Street
P.O. Box 168
Iowa City, IA 52243
(319) 337-1085

Is developing a way to assess SCANS competencies, under a contract with the U.S. Department of Labor's Office of Strategic Planning and Policy Development.

American Youth Policy Forum
1001 Connecticut Avenue NW
Suite 301
Washington, DC 20036-5541
(202) 775-9731

Brings together leading figures in the field of education and youth policy to provide policymakers with assistance and information on the development of an effective school-to-work transition system for the United States. Areas of focus include youth apprenticeship and youth service.

Center for Occupational Research and Development (CORD)
601-C Lake Air Drive
Waco, TX 76710
(817) 772-8756

A non-profit, public service organization that helps education institutions and other organizations provide education, training, and retraining for America's technical workers. CORD formed the National Tech Prep Network to encourage and facilitate nationwide communication among educators, consortia, and business leaders involved in tech prep.

Cornell Youth and Work Program
College of Human Ecology
Human Development and Family Studies
G94 Martha Van Rensselaer
Ithaca, NY 14853-4401
(607) 255-8394

Studies issues relating to youth apprenticeships and runs the Cornell Youth Apprenticeship Demonstration Project located in Binghamton, NY.

Council of Chief State School Officers (CCSSO)
One Massachusetts Avenue, NW
Suite 700
Washington, DC 10001
(202) 408-5505

Current emphasis of CCSSO is on connecting health, child care, welfare, housing, juvenile justice and other services to help students achieve educational success. In addition, CCSSO is trying to develop better connections between school and work by supporting youth apprenticeship efforts in several states.

Jobs for the Future
1815 Massachusetts Avenue
Suite 306
Cambridge, MA 02140
(617) 661-3411

A non-profit, non-partisan organization that develops workforce education, education reform, and economic development strategies. One of its major efforts is the National Youth Apprenticeship Initiative, which supports the development of innovative youth apprenticeship programs at several sites across the country.

National Alliance of Business (NAB)
1201 New York Avenue NW
Washington, DC 20005
(202) 289-2888

Has designed youth apprenticeship programs for Sears and Bank of America and has provided technical assistance for implementing those programs.

National Center on Education and the Economy
39 State Street
Suite 500
Rochester, NY 14614
(716) 546-7620

A non-profit research organization specializing in education and human resources. The Center's Board of Trustees created the Commission on the Skills of the American Workforce which published America's Choice: High Skills or Low Wages! -- a report that has served as the basis of educational reform proposals in several states.

National Center for Research in Vocational Education (NCRVE)
University of California, Berkeley
Graduate School of Education
Berkeley, CA 94720
(415) 642-4404

A resource for research and exemplary practice in vocational education, supported by the U.S. Department of Education. Offers in-service education for state and local leaders in vocational education, disseminates research results, and provides technical assistance to programs serving special populations.

Southern Regional Education Board (SREB)
SREB-State Vocational Education Consortium
592 Tenth Street NW
Atlanta, GA 30318-5790
(404) 875-9211

Is piloting the "High Schools That Work" initiative in high schools and area vocational centers throughout its member states. Offers information on the key practices and strategies of the pilot program, case studies of implementation of the program in pilot sites, and a progress report on student outcomes.

The Institute for Education & Employment (TIEE)
Education Development Center, Inc.
55 Chapel Street
Newton, Massachusetts 02160
(610) 969-7100
FAX: (617) 332-4318

Provides information and technical assistance to "social partnerships" of educators, employers, government, labor and community groups to create work preparation systems that meet the needs of current and future workers, industry, and the economy.

WORKLINK Program
Educational Testing Service
1825 Eye Street NW
Suite 475
Washington, DC 20006
(202) 659-0616

An information service that helps employers match skills their entry-level employees need with the skills of students entering the workforce. Provides employers with electronic access to a data base record of student school performance in a format useable to employers. A joint initiative of the Educational Testing Service and the National Association of Secondary School Principals.

REFERENCES

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Combining School and Work: Options in High Schools and Two-Year Colleges. David Stern. U.S. Department of Education, Office of Adult and Vocational Education. Washington, D.C., March 1991.

Hands and Minds: Redefining Success in Vocational Technical Education. Education Writers Assocication. Washington, D.C., April 1992.

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Making High Schools Work: Through Integration of Academic and Vocational Education. Gene Bottoms, Alice Presson, and Mary Johnson. Southern Regional Education Board. Atlanta, Georgia, 1992.

School-to-Work Connections: Formulas for Success. U.S. Department of Labor, Office of Work-Based Learning. Washington, D.C., 1992.

The School-to-Work Transition and Youth Apprenticeship: Lessons from the U.S. Experience. Thomas Baily and Donna Merritt. Manpower Demonstration Research Corporation. New York, New York, March 1993.

Tech Prep/Associate Degree Concept Paper. National Tech Prep Network, Center for Occupational Research and Development. Waco, Texas, October 1992.

Transition from School to Work: Linking Education and Worksite Training. General Accounting Office. Washington, D.C., August 1991.

NATIONAL STANDARDS GROUPS

Efforts to develop voluntary national standards are under way, with grants from the U.S. Department of Education, in seven subject areas -- science, history, geography, civics, the arts, English, and foreign languages. You can find out more about these efforts by writing and asking for information from individuals in the following organizations:

MATHEMATICS

To order **Curriculum and Evaluation Standards for School Mathematics**
The National Council of Teachers of Mathematics
Order Processing
2906 Association Drive
Reston, VA 22091

Item number: 398E1, ISBN 0-87353-273-2
Cost: $25 each (discounts for bulk orders)

SCIENCE

National Academy of Sciences
National Research Council
2101 Constitution Avenue, NW
Washington, DC 20418

Contact: Ken Hoffman
Completion: summer 1994

HISTORY

National Center for History in the Schools at UCLA
231 Moore Hall, 405 Hilgard Avenue
Los Angeles, CA 90024

Contact: Charlotte Crabtree
Completion: spring 1994

ARTS

Music Educators National Conference
1902 Association Drive
Reston, VA 22091

In coordination with the American Alliance for Theatre and Education, the National Art Education Association, and the National Dance Association

Contact: John Mahlmann
Completion: summer 1994

Civics

Center for Civic Education
5146 Douglas Fir Road
Calabasas, CA 91302

Contact: Charles Quigley
Completion: summer 1994

Geography

National Council of Geographic Education

In coordination with the Association of American Geographers, the National Geographic Society and the American Geographical Society

Contact: Anthony de Souza
Geography Standards Project
1600 M Street, NW
Washington, DC 20036
Completion: winter 1993

English

The Center for the Study of Reading
174 Children's Research Center
52 Gerty Drive
Champaign, Il 61820

In coordination with the National Council of Teachers of English and the International Reading Association

Contact: Jean Osborn
Completion: fall 1995

Foreign Languages

American Council on the Teaching of Foreign Languages
6 Executive Plaza
Yonkers, New York 10701-6801

In coordination with the American Association of Teachers of French, the American Association of Teachers of German, and the American Association of Teachers of Spanish and Portuguese.

Contact: C. Edmund Scebold
Completion: 1995 - 96

Documents That Communities Can Use To Begin Raising Academic Standards *Today*

Voluntary national standards are being developed in seven subject areas and are expected to emerge in 1995 and 1996. But many communities are not about to wait two or three years before they begin raising academic standards for their own students. They want to get started now, so they're using many of the same reports and frameworks that national standards setting groups are using.

Following are some of the documents being read, discussed, and used to inform the development of national standards:

English

English-Language Arts Framework for California Public Schools, K-12, 1987.
Provides teachers, administrators, parents and publishers with an understanding of the State of California's philosophy of English education. It directly relates to English-language arts curriculum standards and guidelines published by the California Department of Education.

California Department of Education
Publicity/Sales Department
P.O. Box 271
Sacramento, California 95812
(916) 445-1260

Supplemental Materials from the California Department of Education

Recommended Readings in Literature, K-8, Annotated Edition, 1988.
Recommended Readings in Literature, Grades 9-12, 1990.
Compiled by California teachers, librarians, and administrators to assist local schools in offering diverse, high quality works of literature.

Reading Objectives: 1990 Assessment, 1989.
Objectives being used to develop the National Assessment of Educational Progress in reading. Created by a national consensus process involving reading specialists, curriculum specialists, teachers and school administrators.

Ms. Munira Mwalimu
Aspen Systems, Inc., Suite 701
962 Wayne Avenue
Silver Spring, Maryland 20910
(301) 495-8623

Writing Assessment Framework for the 1994 National Assessment of Educational Progress (draft), 1992.
Objectives being used to develop the National Assessment of Educational Progress in writing. Created by a national consensus process involving writing specialists, curriculum specialists, teachers and school administrators.

Ms. Munira Mwalimu
Aspen Systems, Inc., Suite 701
962 Wayne Avenue
Silver Spring, Maryland 20910
(301) 495-8623

MATHEMATICS

Curriculum and Evaluation Standards for School Mathematics, 1989.
Created by a national group of experts and teachers of mathematics. Establishes 54 standards for mathematics achievement.

National Council of Teachers of Mathematics
Order Processing
1906 Association Drive
Reston, Virginia 22091
(800) 235-7566, extension 135
Fax: (703) 476-2970

Supplemental Materials from NCTM

Curriculum and Evaluation Standards Addenda Series
Developed to complement the NCTM Standards. Includes 22 volumes, each offering activity suggestions, teacher resources and assessment criteria for specific grade levels and content areas.

Mathematics Framework for California Public Schools, K-12, 1992.
Expands upon the 1985 Mathematics Framework. Includes general goals and objectives as well as specific suggestions and alternatives to meet those goals.

California Department of Education
Publicity/Sales Department
P.O. Box 271
Sacramento, California 95812
(916) 445-1260

SCIENCE

Science for All Americans, 1989.
Published by the American Association for the Advancement of Science. Examines the substance and character of scientific education for all citizens. Defines common knowledge required for scientific literacy.

Oxford University Press
Order Department
2001 Evans Road
Cary, North Carolina 27513
(800) 451-7556

Science Framework for California Public Schools, K-12, 1990.
Provides discussion of pedagogical approaches and processes, such as the scientific method, as well as specific recommendations for systemic reforms in science education, including suggestions for attracting more students to science classes.

California Department of Education
Publicity/Sales Department
P.O. Box 271
Sacramento, California 95812
(916) 445-1260

Science Assessment Framework for the 1994 National Assessment of Educational Progress (draft), 1992.
Objectives being used to develop the National Assessment of Educational Progress in science. Created by a national consensus process involving scientists, curriculum specialists, teachers and school administrators.

Ms. Munira Mwalimu
Aspen Systems, Inc., Suite 701
962 Wayne Avenue
Silver Spring, Maryland 20910
(301) 495-8623

HISTORY

History Assessment Framework for the 1994 National Assessment of Educational Progress.
Objectives being used to develop the National Assessment of Educational Progress in history. Created by a national consensus process involving historians, curriculum specialists, teachers and school administrators.

Ms. Munira Mwalimu
Aspen Systems, Inc., Suite 701
962 Wayne Avenue
Silver Spring, Maryland 20910
(301) 495-8623

Building a History Curriculum: Guidelines for Teaching History in Schools, 1988.
Outlines six "Vital Themes" to be considered in the study of history, which can be used in designing and implementing a history curriculum.

National Council for History Education
26915 Westwood Road
Suite B-2
Westlake, Ohio 44145
(216) 835-1776

History-Social Science Framework for California Public Schools, K-12, 1988.
Outlines and organizes historical facts and concepts into a chronological, sequential system. Includes strands on geographic, historical, and civic literacy.

California Department of Education
Publicity/Sales Department
P.O. Box 271
Sacramento, California 95812
(916) 445-1260

Lessons from History: Essential Understandings and Historical Perspectives Students Should Acquire
Written by historians, curriculum leaders and classroom teachers. Identifies historical themes and understandings to be taught in grades K-12. A resource for setting standards and developing assessments, for teachers, curriculum planners, and policy makers.

National Center for History
Attention: Pamela Hamilton
University of California, Los Angeles
Moore Hall 231
405 Hilgard Avenue
Los Angeles, California 90024-1521
(310) 825-4702

GEOGRAPHY

Guidelines for Geography Education: Elementary and Secondary Schools, 1984.
Employs five fundamental themes of geography to serve as guidelines for general geographic concepts, course offerings and student achievement.

National Council for Geography Education
16A Leonard Hall
Indiana University of Pennsylvania
Indiana, Pennsylvania 15705
(412) 357-6290

Supplemental Materials from the NCGE

K-6 Geography: Themes, Key Ideas and Learning Opportunities, 1987.
7-12 Geography: Themes, Key Ideas and Learning Opportunities, 1989.
Serve as resources for key concepts and actual classroom activities. Expand upon and illustrate examples for implementation of the Guidelines for Geographic Education.

Geography Assessment Framework for the 1994 National Assessment of Educational Progress (draft), 1992.
Objectives being used to develop National Assessment of Educational Progress in geography. Created by a national consensus process involving geographers, curriculum specialists, teachers and school administrators.

Ms. Munira Mwalimu
Aspen Systems, Inc., Suite 701
962 Wayne Avenue
Silver Spring, Maryland 20910
(301) 495-8623

History-Social Science Framework for California Public Schools, K-12, 1988.
Outlines and organizes historical facts and concepts into a chronological, sequential system. Includes strands on historical, geographic, and civic literacy.

California Department of Education
Publicity/Sales Department
P.O. Box 271
Sacramento, California 95812
(916) 445-1260

CIVICS

CIVITAS: A Framework for Civic Education, 1991.
Developed by the Center for Civic Education and the Council for the Advancement of Citizenship. Designed to guide curriculum designers, teachers, and administrators as they design a program to enable students to gain an understanding of the fundamental concept of citizenship, and the rights and responsibilities that accompany it.

Maxway Data Corporation
225 W. 34th Street
Suite 1105
New York, New York 10001
(800) 683-0812

History-Social Science Framework for California Public Schools, K-12, 1988.
Outlines and organizes historical facts and concepts into a chronological, sequential system. Includes strands on geographic, historical, and civic literacy.

California Department of Education
Publicity/Sales Department
P.O. Box 271
Sacramento, California 95812
(916) 445-1260

ARTS

Visual and Performing Arts Framework for California Public Schools, K-12, 1989.
Provides guidelines for teaching dance, drama/theater, music and the visual arts through instruction in art appreciation and comprehension, as well as student expression.

California Department of Education
Publicity/Sales Department
P.O. Box 271
Sacramento, California 95812
(916) 445-1260

Model Learner Outcomes for Art Education, 1991.
Sets standards for artistic knowledge and abilities for students. Includes evaluation criteria.

Minnesota Curriculum Services Center
70 West County Road B-2
Little Canada, Minnesota 55117
(800) 652-9024
(612) 483-4442

School Music Program: Description and Standards, 1986.
Contains philosophy of music education, suggests subject matter mastery levels for students of all ages, and provides administrative and pedagogical standards and methods of implementation.

The Music Educators National Conference
Publicity/Sales Department
1902 Association Drive
Reston, Virginia 22091
(703) 860-4000

Arizona Visual Arts Essential Skills, 1988.
Based upon three "quality components" of hands-on "Creative Art Expression," "Aesthetic Assessment" and knowledge of "Art in Cultural Heritage." Suggests ways to integrate art education with other disciplines.

Arizona Department of Education
Central Distribution Services
1535 West Jefferson
Phoenix, Arizona 85007
(602) 542-4361

Dance Curricula Guidelines for K-12, 1988.
Serves as a resource for curriculum design. Includes general foundations for dance education as well as an annotated bibliography of state dance curriculum guidelines.

AAHPERD Publication Sales
1900 Association Drive
Reston, Virginia 22091
(800) 321-0789

OBJECTIVES FOR REACHING NATIONAL EDUCATION GOAL 5

National Education Goal 5: By the year 2000, every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.

Objectives:

- Every major American business will be involved in strengthening the connection between education and work.
- All workers will have the opportunity to acquire the knowledge and skills, from basic to highly technical, needed to adapt to emerging new technologies, work methods, and markets through public and private educational, vocational, technical, workplace, or other programs.
- The number of quality programs, including those at libraries, that are designed to serve more effectively the needs of the growing number of part-time and mid-career students will increase substantially.
- The proportion of college graduates who demonstrate an advanced ability to think critically, communicate effectively, and solve problems will increase substantially.

Kirk Winters of the Office of Policy and Planning wrote and directed research for this paper -- with help from Brett Scoll of the Office of Policy and Planning, who coordinated the research.

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