DOCUMENT RESUME

ED 407 515 CE 073 914

TITLE	Curriculum Integration in School-to-Work Systems. Resource Bulletin.
INSTITUTION	National School-to-Work Opportunities Office, Washington, DC.
PUB DATE	Apr 96
NOTE	7p.
AVAILABLE FROM	National School-to-Work Office, 400 Virginia Avenue, S.W., Room 210, Washington, DC 20024; 800-251-7236; fax: 202-401-6211; World Wide Web: http://www.stw.ed.gov.
PUB TYPE	Information Analyses (070)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Academic Education; *Curriculum Development; *Education Work Relationship; *Educational Practices; Educational Resources; *Educational Strategies; High Schools; *Integrated Curriculum; Labor Force Development; Program Implementation; School Business Relationship; Vocational Education; Youth Opportunities; Youth Programs
IDENTIFIERS	High Schools That Work; School to Work Opportunities Act 1994

ABSTRACT

The School-to-Work Opportunities Act broadens the meaning of curriculum by calling for integrated learning organized into coherent sequences around broadly conceived career majors. Work experience, as well as academic and occupational study, is an assumed element of the integrated school-to-work curriculum. A variety of strategies for curriculum integration have been implemented through collaborative planning involving school administrators, teachers, employers, and labor unions. Approaches to curriculum integration include coordinated curriculum, project-based learning, and thematic curriculum. The National Center for Research in Vocational Education has identified several models of curriculum integration: (1) work-relevant academic curriculum; (2) incorporation of academic content into occupational courses; (3) project-based instructional strategies; (4) curriculum alignment; (5) career pathways; (6) occupational high schools and magnet schools; and (7) career academies. Examples of effective practices include the following: the Southern Regional Education Board's 18 "High Schools that Work" sites, the career pathways curriculum at Roosevelt Renaissance High School in Portland, Oregon, and the school-within-a-school at the Oakland, California, Health and Bioscience Academy. (Seven publications are listed and nine organizations are described as resources.) (KC)

SCHOOL TO WORK OPPORTUNITIES
U.S. DEPARTMENT OF EDUCATION ☆ U.S. DEPARTMENT OF LABOR

ED 407 515

★RESOURCE BULLETIN

APRIL 1996

Curriculum Integration in School-to-Work Systems

When most people hear the word "curriculum," they think of school classrooms where students acquire learning through a standardized course of study consisting of readings, lectures, written assignments, and perhaps some discussion. The School-to-Work Opportunities Act broadens the meaning of curriculum by calling for *integrated learning* organized into coherent sequences around broadly conceived career majors. *Work experience*, as well as academic and occupational study, is an assumed element of the integrated school-to-work curriculum.

In fact, the movement to integrate curricula in school-to-work systems is driven by the recognition that neither academic nor occupational education alone provides all students with the skills--problem-solving, reasoning, interactive learning--necessary for further education and for high-wage employment. Integrated learning also restores meaning and relevance to the student's experience of schooling, transforming what in too many high schools is a disjointed series of courses into a meaningfully integrated, experientially grounded education that continually demonstrates to students how education applies to real life. Integrated learning is also a teaching strategy that more closely matches human cognition than traditional high school class work. Cognitive research shows that students whose education makes them the passive recipients of education are usually less able to integrate and to apply what they learn in the classroom to other settings.

Together, educators, employers, and labor unions have implemented a variety of strategies for curriculum integration. This bulletin describes promising strategies for developing integrated curricula and identifies publications and organizations that can provide additional information.

Collaborative Planning. The development of integrated curricula requires collaborative planning among school administrators, academic and occupational teachers, employers, and labor unions. A number of state and local school systems have organized curriculum councils that bring together stakeholders to identify options for integrating classroom instruction with work-based learning. School-to-work partnership meetings also provide opportunities for building these connections.

School administrators facilitate the development of integrated curricula by decentralizing management and adopting decision-making models that promote interaction among teachers across disciplines. Administrators can also reconfigure schools into smaller learning communities (e.g., schools within schools) and encourage flexible scheduling to create new opportunities for students to apply academic and occupational learning in work settings. Providing teachers with time for professional development, as well as time to work together, also supports the development of integrated curricula.

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Collaboration among teachers is essential. Two or more teachers from different disciplines can work together to coordinate their class instruction, develop materials, link academic and occupational skills, and develop alternative instructional strategies. Teacher collaboration often takes place in curriculum teams formed around an occupational theme. Teachers need the opportunity to examine, experiment, and evaluate alternative approaches. A number of school systems give teachers an extra preparation period or time in the summer to work with employers and labor unions to develop curricula that integrate academic with work-based learning. Through internships in work places, teachers acquire experiences that help them apply industry-related skills and expectations to their classroom instruction.

Employers and labor unions also play key roles in developing integrated curricula. They enhance curriculum development by providing examples of how concepts learned in the classroom are applied in the workplace. Structured work-based learning enhances school-based instruction by giving students opportunities to apply academic concepts and strengthen the occupational skills necessary for success in the workplace. The development of skills standards gives employers and labor unions another avenue for helping educators identify what particular industries expect their workers to know and to be able to do.

Approaches to Curriculum Integration. Developers of integrated curriculum will find a great variety of approaches and models, ranging from the relatively simple to the more complex--in which the entire school is restructured. Jobs for the Future, in its *Toolkit* for local programs, offers three examples of integrated learning:

- *Coordinated curriculum* realigns course work so that instructors in different disciplines teach related topics concurrently, using occupational themes as the organizing principle for integrating academic lessons, occupational study, and workplace experience.

- *Project-based learning* engages teachers and students, in collaboration, to create projects organized around an occupational or on-the-job issue, requiring students to apply what they have learned both in the workplace and in school to address practical problems.

- *Thematic curriculum* eliminates the traditional distinctions between disciplines, instead organizing learning around questions or problems within the school-to-work program's occupational theme, which students then address from the perspectives acquired from both academic (history, science, and so forth) and workplace learning.

W. Norton Grubb and other researchers at the National Center for Research in Vocational Education (NCRVE) have identified several models of curriculum integration:

- *Making academic course work more relevant to work* is the most common approach to curriculum integration, due to time and resource constraints and the availability of "off the shelf" applied curriculum materials.

- *Incorporation of academic content into occupational courses* is an inexpensive mechanism for reinforcing students' acquisition of essential skills and knowledge.

- *Project-based instructional strategies* encourage students to be active participants in the learning process by synthesizing and applying subject-specific knowledge and skills to actual problems and situations.

- *Curriculum alignment* links instruction in one of two ways: *horizontal alignment* occurs when teachers within a grade level coordinate instruction across disciplines, and *vertical alignment* occurs when learning is connected across grades in order to build cumulative, comprehensive, increasingly complex sequences of learning experiences.

- *Career pathways* offer students access to a range of career options through integrated programs of instruction and work-based learning tied to their academic and occupational interests. Career pathways offer a more comprehensive approach to curriculum integration and often encompass several of the preceding strategies.

- *Occupational high schools and some magnet schools* have made curriculum integration the foundation for school-wide restructuring. Schools that are occupation-oriented often have access to additional resources for linking academic instruction with workplace applications--resources such as equipment, specialized curricular materials, industry advisory boards, and an established network of work-based learning opportunities.

- *Career Academies (e.g., schools within schools)* offer many of the advantages of occupational and magnet schools, yet usually operate on a smaller scale. The typical career academy, which has a team of academic and occupational teachers working with the same students for two or three years, offers a wealth of opportunities for curriculum integration, including work-based learning.

Whatever combination of strategies a school-to-work system adopts, the school-to-work curriculum by definition must synthesize academic and occupational study with work-based learning and work experience.

Using Outside Curriculum Sources. Educators and employers who want additional information about integrated curricula or samples of such curricula can turn to a number of national organizations. Almost every state funds curriculum centers that provide services including curriculum development, gathering and dissemination of curriculum and instructional materials, and workshops in curriculum development. Organizations such as the Center for Occupational Research and Development (CORD) and The Network, Inc. have developed integrated curriculum packages explicitly for use in school-to-work systems. These packages are often used as starting points for curriculum integration efforts that incorporate the unique ideas and resources available in a particular school, community, or state.

Effective Practices

The Southern Regional Education Board (SREB) has developed eighteen *High Schools That Work* sites that are serving as "advanced integration models." To develop integrated curricula, each site establishes a team of academic and occupational teachers and administrators. Each site also designates a coordinator to provide leadership, represent the team, and complete team reports. The

teams have at least ten hours a month to plan interdisciplinary learning activities. Each team also participates in a one-week summer curriculum development workshop sponsored by SREB and completes a second week of summer curriculum planning at the school. Team members can also attend SREB-sponsored fall and spring workshops and sharing sessions. At these meetings, teachers share activities, plans, and lessons learned.

Many *High Schools That Work* sites use a project approach to curriculum integration. The Trigg County High School in Cadiz, Kentucky, has developed a project in which students design a competitive proposal for construction of a company's corporate headquarters. Using the budget, location, and company profile, students develop the proposal from start to finish. Student activities include determination of building specifications based on location and company profile, a title search to ensure that property is available for construction, preparation of working drawings, an environmental impact study, writing the proposal, and presentation of the proposal to a judging committee. The project incorporates a variety of disciplines: English, in the writing and presentation; science, in conducting the environmental impact study; social studies, in studying the corporation and its requirements; business, in conducting a title search; and technology, in developing floor plans, elevations, schedules, and models. For more information, contact Brenda McKinney, Trigg County High School, 202 Main Street, Cadiz, Kentucky ★ (502) 522-2215

At **Roosevelt Renaissance High School** in Portland, Oregon, career pathway teams created four-year curricula for each of six distinct pathways. These teams continue to work on integrating basic skills instruction into the pathways. Each of the Roosevelt curricula initially focus on building a solid foundation of academic skills while instilling responsibility, self-esteem, and work ethics. Teachers incorporate applied learning techniques within reading, writing, and math classes. The relevance of class work is underscored by constant demonstrations of the connections between school and work. A variety of teaching methods and classroom activities, including hands-on projects and student portfolios, encourages the development of teamwork, problem solving, critical thinking, and communications skills. As students explore career options, the curricula provide career information, planning, and guidance for all students. For more information, contact Janet Warrington, Roosevelt High School, 6941 N. Central, Portland, Oregon 97203 ★ (503) 280-5138

Oakland Health and Bioscience Academy exemplifies the school-within-a-school approach to curriculum integration. Integrated curricula in math, science, English, social studies, and health encourage students as individuals and in teams to apply the knowledge acquired in a discipline to interdisciplinary projects and internships. Portfolio assignments and projects integrate school-based and work-based learning, and academy teachers meet with industry supervisors to coordinate school and workplace curricula. In addition, all students are expected to complete practica that engage them as positive agents of change, applying newly acquired academic and technical skills in their own communities. For more information, contact Mrs. Jordan, 4351 Broadway, Oakland, CA 94611 ★ (510) 658-5300.

FOR MORE INFORMATION ABOUT THIS TOPIC, CONSULT THE FOLLOWING PUBLICATIONS AND ORGANIZATIONS:

Publications

Ascher, Carol and Erwin Flaxman. *A Time for Questions: The Future of Integration and Tech Prep.* New York: Institute on Education and the Economy, 1993.

Braunger, Jane and Sylvia Hart-Landsberg. *Crossing Boundaries: Explorations in Integrative Curriculum.* Portland, Oregon: Northwest Regional Education Laboratory, 1994.

Grubb, W. Norton, ed. *Education Through Occupations in American High Schools.* Volumes I & II. Williston, VT: Teachers College Press, 1995.

Jobs for the Future. *School-to-Work Toolkit: Building a Local Program.* Cambridge, MA: Jobs for the Future, 1994.

Roegge, Chris A., James R. Galloway, and Julie A. Welge. *Setting The Stage: A Practitioner's Guide to Integrating Vocational and Academic Education.* Springfield, IL: Illinois State Board of Education, 1991.

Schmidt, B. June, Curtis R. Finch, and Susan L. Faulkner. *Teachers' Role in the Integration of Vocational and Academic Education.* Berkeley, CA: The National Center for Research in Vocational Education, 1992.

Southern Regional Education Board. *Integrated Learning.* Atlanta, GA: Southern Regional Education Board, 1995.

Organizations

Association for Supervision & Curriculum Development (ASCD) is an international community of educators dedicated to the improvement of instructional supervision, instruction, and curriculum design. ASCD disseminates information on education research and classroom practices and forges links among educators through publications and training programs, seminars and conferences. ASCD is particularly interested in the general topic of curriculum integration and has sponsored both publications and conferences on this subject. 1250 North Pitt Street, Alexandria, VA 22314-1453 ★ (703) 549-9110.

California Institute on Human Resources at Sonoma State University in California provides hands-on training for schools and school-community teams in integrating academic curriculum through their School Restructuring Services and project VANGUARD. Incremental steps and constructivist facilitation build capacity for groups to write actual integrated curriculum during the workshops as well as a plan for implementation at their site. 1801 E. Cotati Avenue, Rohnert Park, CA 94928 ★ (707) 664-3929.

Center for Law and Education's VOCED Project works with schools and communities to develop school-to-work systems and improve occupational education programs. The VOCED Project publishes policy papers as well as practical guidelines and conducts workshops and conferences on how to improve programs. 1875 Connecticut Avenue, NW, Suite 510, Washington, DC 20009 ★ (202) 986-3000.

Center of Occupational Research and Development (CORD) is a service organization that helps educators in schools and industry address the technical education, training, and retraining needs of workers. A primary organizational focus is the development of applied academic curricula. Among the curricula available from CORD are *Applied Mathematics, Applications in Biology/Chemistry, Principles of Technology,* and *Tech Prep Resources*. 601 Lake Air Drive, P.O. Box 21689, Waco, TX 76702-1689 ★ (817) 772-8756.

National Center for Research in Vocational Education (NCRVE) was established under the Carl D. Perkins Vocational Education Act to sponsor applied research and development in the field of occupational education. NCRVE has funded a variety of projects and published several reports on integrated curriculum. University of California at Berkeley, 1995 University Avenue, Suite 375, Berkeley, CA 94704 ★ (510) 642-4004.

National Consortium for Product Quality (NCPQ) is a project funded by the National Center for Research in Vocational Education and directed by the Center on Education and Work, University of Wisconsin-Madison. The NCPQ was established to accomplish a two-fold mission: (1) to develop, research, and implement school-to work product standards; and (2) to develop a national review process by which school-to-work materials can be collected, evaluated, and disseminated. Center on Education and Work, 964 Education Sciences Building, 1025 West Johnson Street, Madison, WI 53706 ★ (608) 263-3152 ★ Internet: bdougherty%cew@soemadison.wisc.edu.

The Network, Inc. is a nonprofit organization formed to link innovative schools in Massachusetts with each other. The Center for Learning, Technology, and Work, a division of The Network, helps schools and districts that are developing school-to-work efforts. In order to support teachers and administrators who are designing new programs, the Center provides assistance on implementing school-to-work strategies, restructuring high school curricula to support workplace learning, introducing technology education programs, and integrating academic and occupational education. 300 Brickstone Square, Suite 900, Andover, MA 01810 ★ (508) 470-1080.

Southern Regional Education Board's *High Schools That Work* program, operated by **SREB's State Vocational Education Consortium**, aims to improve the education of students enrolled in high school occupational programs at more than three dozen pilot sites. The consortium develops, applies, evaluates, and promotes strategies to strengthen students' competencies in communications, mathematics, science, critical-thinking, and problem-solving. 592 Tenth Street, NW, Atlanta, GA 30318-5790 ★ (404) 875-9211.

For additional information, please contact:
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updated 3/97

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