DOCUMENT RESUME

ED 378 681 EA 026 445

AUTHOR McNeir, Gwennis
TITLE Applied Learning: Strategies for Integrating Academic and Vocational Education.
INSTITUTION Oregon School Study Council, Eugene.
REPORT NO ISSN-0095-6694
PUB DATE Sep 94
NOTE 49p.
AVAILABLE FROM Publication Sales, Oregon School Study Council, University of Oregon, 1787 Agate Street, Eugene, OR 97403-5207 ($7, nonmembers; $4.50, members; quantity discounts; $3 postage and handling on billed orders).
PUB TYPE Collected Works - Serials (022)
JOURNAL CIT OSSC Bulletin; v38 n1 Sep 1994

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Cooperative Education; Curriculum Design; Educational Cooperation; Elementary Secondary Education; *Integrated Activities; *Integrated Curriculum; *Interdisciplinary Approach; Partnerships in Education; *Vocational Education

ABSTRACT

A current focal point of Oregon's school restructuring effort is on closing the gap between academic and vocational disciplines to increase opportunities for all students. This Bulletin examines a spectrum of practices aimed at facilitating integration of academic and vocational education while exploring issues, problems, and solutions common to all approaches. The introduction summarizes the key arguments for integration and gives an overview of its premises. Chapter 1 introduces various models of integration and some of the components of a revised curriculum. Chapter 2 examines partnerships and collaborative efforts--key components of the shift to applied learning--among various members of the education system. The third chapter examines barriers to integration and synthesizes successful administrative approaches. The conclusion highlights ongoing issues that must be confronted as the process of integration moves forward. Data from telephone interviews conducted with 10 Oregon education specialists and administrators illustrate chapter themes. (LMI)

APPLIED LEARNING

Strategies for Integrating Academic and Vocational Education

Gwennis McNeir

Oregon School Study Council
September 1994 • Volume 38, Number 1

OSSC BULLETIN

APPLIED LEARNING

Strategies for Integrating Academic and Vocational Education

Gwennis McNeir

Oregon School Study Council
September 1994 • Volume 38, Number 1

ISSN 0095-6694
Nonmember price: $7.00
Member price: $4.50
Quantity Discounts:
10-24 copies - 15%
25-49 copies - 20%
50+ copies - 25%

OSSC STAFF

Philip K. Piele, Executive Secretary
Stuart C. Smith, Editor
Linda S. Lumsden, Associate Editor
C. Joelle Scrbacic, Layout Specialist
Ann McLennan, Publications Sales

OSSC GOVERNING BOARD

Dave Cone, School Board Member, Gresham Grade SD 4
Joan Peterson, School Board Member, Ontario SD 8
Bill Korach, Superintendent, Lake Oswego SD 7J
Bob Stalick, Superintendent, Greater Albany Public SD 8J
Marilyn Pheasant, Superintendent, Olney SD 11
Philip K. Piele, Professor and Executive Secretary,
Oregon School Study Council
David Conley, Associate Professor, Educational Policy and Management,
University of Oregon
Diane Harr, School Board Member, Parkrose School District 3

OREGON SCHOOL STUDY COUNCIL

1787 Agate Street
College of Education
5207 University of Oregon
Eugene, Oregon 97403-5207
(503) 346-5044
Fax: (503) 346-2334

Preface

Like many states, Oregon is engaged in an ongoing process of school reform that involves significant restructuring of many aspects of schooling. A current focal point is the gap between academic and vocational disciplines. Many policy-makers and educators want to close that gap to increase opportunities for all students. Approaches to achieving this include weaving applied learning methods into the curriculum, making stronger connections between the classroom and real-life challenges, and easing the transition from school to work.

Recent amendments to the Carl D. Perkins Vocational and Applied Technology Education Act of 1990, which provides grants to local education agencies and postsecondary institutions for tech-prep demonstration programs, purport to strengthen practices that have already been legislated at the state level. Although they share common goals, the practices designed to foster integration of academic and vocational education encompass an enormous range and scope. This Bulletin examines a spectrum of practices aimed at facilitating integration while exploring issues, problems, and solutions common to all approaches.

The introduction summarizes the key arguments for integration and gives an overview of its premises. Chapter 1 introduces various models of integration and some of the components of a revised curriculum. Chapter 2 examines partnerships and collaborative efforts—key components of the shift to applied learning—among various members of the education system. Chapter 3 looks at barriers to integration and synthesizes successful administrative approaches. The conclusion highlights ongoing issues that must be confronted as the process of integration moves forward.

Gwennis McNeir is a freelance writer who lives in Seattle.

Contents

	Preface	iii
	Introduction: The Future of 'The Forgotten Half'	1
	The Need for Integration	1
	What Is Integration?	2
	The Challenge for Educators	3
1.	**Mapping a New Path**	5
	An Evolving Definition	5
	Grubb's Five-Step Ladder	6
	Tech Prep: Building Bridges	7
	Elements of a Revised Curriculum	8
	Crafting a Custom Vision	14
2.	**Breaking Boundaries, Building Teams**	16
	Generating Support for the Vision	16
	Teacher Collaboration and Innovation	17
	Partnerships with the Business Community	20
	The Developing Role of the Guidance Counselor	23
	Involving Parents	25
3.	**Paving the Way for Change**	27
	Portrait of a Hypothetical Administrator	27
	Roadblocks to Reform	29
	Blazing the Trail	31
	Handling Teacher Concerns and Resistance	31
	Removing Roadblocks	34
	Conclusion: Proceed with Caution	36
	Rethinking School Structures	36
	Reassessing Values	37
	Bibliography	39
	Interviews	42

Introduction: The Future of the 'Forgotten Half'

As the quest to improve education for all young people continues, new issues are coming to light. Many initial reform efforts centered on strengthening academic competencies through such practices as increasing graduation requirements, adding rigor to the academic curriculum, and emphasizing higher level math and science skills. These reform efforts, while benefitting students who were college-bound, did little to increase options for more than half the high school population—those involved in vocational or "general" programs of study.

In a provocative report, The William T. Grant Foundation argued that noncollege-bound students, dubbed the "forgotten half," had been ignored by the school-reform movement (Grant Commission 1988). For these youth, an approach based on increased graduation requirements meant "minimum basic skills testing; another year of repetitive, lower-track English, mathematics, science, and rudimentary vocational courses; and remedial studies at the expense of challenging vocational studies" (Gene Bottoms and others 1992).

The Need for Integration

Educators began to question whether vocational and general-education paths were effectively training students in the skills they need to enter the work force. The world of work has changed drastically in the last decade, and "experts on education and the economy are worried by the growing gap they see between the capabilities of high school graduates, especially those not bound for college, and the skills, knowledge, and habits of mind that employers seek" (John O'Neil 1992).

Many analysts predict that less that 30 percent of the jobs created in the future will require a college degree. What they will demand, according to

employers, is a complex set of skills, including problem-solving, strong communication, independent thinking and decision-making, and the ability to apply theoretical knowledge in a hands-on setting. Due to the demanding nature of a fast-paced global marketplace and rapidly changing technology, the term *unskilled labor* is rapidly becoming obsolete. Tomorrow's worker needs to possess strong generic academic skills as well as mastery of the competencies needed to be effective on the job. Unfortunately, traditional vocational programs have frequently fallen short in providing students with either.

Plagued by a lack of both credibility and resources, vocational programs "are often, literally and figuratively, in the basement of the school. They have become a 'dumping ground,' and both the students and the teachers in these programs have the lowest status in the school" (Larry Rosenstock 1991). The practice of tracking reinforces the belief that students come to school with differing capabilities and that these capabilities cannot be altered. As a nation, we are paying a great price in terms of our economic and cultural competitiveness as well as wasted human potential because of the devaluation of vocational learning (Monika Aring 1993). A new definition of vocational learning, one that embraces the full spectrum of skills and competencies needed for students to be effective in any societal role, is needed.

Some reformers today concede that "academic education might not be the only way to improve the high school experience; an effective mixture of both academic and vocational studies might be a way to achieve a common goal of preparing high school students to work and learn" (Bottoms and others). Ensuring that all students are trained in academic competencies while simultaneously developing the applied skills needed in the workplace is the impetus for what many educators believe is the next, long overdue step in education reform: the integration of academic and vocational education.

What Is Integration?

The term *integration* refers to "various ways in which educators are changing practices and curricula to provide students with a balanced mix of academic and vocational experience based on the concept of applied learning" (Sandra Pritz 1989). The premise behind integration is twofold: all students, especially those deemed "at risk," need access to improved academic curriculum as well as a greatly strengthened connection between school and work. Among the many problems integration proposes to address are poor basic and generic work-related skills, inability to apply knowledge, lack of engagement, poor preparation for ttransition to either college or the workplace, and the negative effects of tracking. Its themes include a richer,

more coherent curricula; more activity-based pedagogy; teacher collaboration and coordination; and more attention to the transition to life after high school (Susan Bodilly and others 1992).

State and federal legislation has combined with grassroots efforts to address issues of integration. Oregon has lived up to its tradition as a state of pioneers by being among the first states to legislate a variety of initiatives aimed at linking academic and vocational practices. Oregon's Educational Act for the 21st Century, passed in 1991, reflects the recommendations of a 1990 report by the National Center on Education and the Economy entitled *America's Choice: High Skills or Low Wages!* The Oregon legislation includes the creation of certificates of mastery, committees dedicated to creating strategies for developing a world-class work force, increased funding and development of Head Start and other early childhood programs, tech prep programs, school-to-work transition, and performance-based assessment. Notes Olsen, "Oregon's law is being watched closely by other states that believe the quality of their schools and their economy are tightly linked" (1992).

Recent amendments to the Carl D. Perkins Act promise to bolster what is already a burgeoning effort at the state level. Key features of the act are the requirement that vocational and academic education be broadly integrated; that vocational education move from occupationally specific, narrow, skill-based training to offer instruction in "all aspects of an industry"; and that vocational education increasingly forge links with community economic-development efforts. Many reformers believe the Perkins amendments constitute "a radical departure from past practice in vocational education. For local educators, parents, students, and community members, this new law creates unique possibilities for a new kind of collaboration" (Rosenstock).

The Challenge for Educators

While diverse educational stakeholders are reaching a consensus that integration is an appropriate next step in reform, there are a wide variety of motives and models for implementation. Although the stimulus to integrate academic and vocational strands may have been generated at a governmental level, it's up to educators at the building level to translate that injunction into a vision and methodology appropriate for the needs and resources of individual schools. As the concept is explored in practice, "each group tends to define the specific aspects of integration in ways that highlight its potential to solve problems of interest to that group" (Pritz).

Many reformers believe that integration requires monumental restructuring of high schools. Rejecting the individual model, most integration

efforts involve some level of revised curriculum; teacher innovation and collaboration; and strengthened partnerships among staff, business and labor, and the community. Integration requires a significant investment in capacity-building and staff development as well as unwavering support from administration. In addition, educators must continue to wrestle with questions of assessment, regulatory constraints, and procuring the necessary time and money.

Although integration shows great promise as a means for focusing a variety of education reform issues and has demonstrated notable results in many programs, as a movement it continues to be faced with a number of barriers and considerations that must be continually reexamined as the process of integration continues. These barriers and some possible ways around them are the subject of chapter 3. In the next chapter attention turns to the many different paths educators are following to reach the goal of an integrated curriculum.

Chapter 1

Mapping a New Path

Most reformers agree that the ultimate aim of integration should be to strengthen the academic basis of vocational education, the connection between concept learning and application in academic education, and the application of academic skills in the workplace (Sandra Pritz 1989). However, within the broadly encompassing goals of integration lies a spectrum of definitions, approaches, and particular practices.

When examining the ways in which integration can be put into practice, it is important for each school to develop an individualized idea of what the process means to them. Instead of a single model of effective change, the "best" model is the one most appropriate for the goals, needs, and resources of a particular school.

An Evolving Definition

Because the term *integration* describes both a concept and a range of practices, theorists employ a confusing variety of terms, sometimes interchangeably, that may mean different things depending on the context. The cumbersome phrase "integration of academic and vocational education" is usually used to describe the reform movement as a whole.

The terms *applied learning* and *integrated learning* both describe a range of approaches that attempt to link conceptual and practical modes of thinking.

Applied academics most often refers to a distinct curriculum design based on off-the-shelf materials produced by educational research groups. All four terms have to do with linking abstract ideas with practical applications, but in practice definition becomes relative to the specific context.

Dan Johnson, area director of Oregon's Salem-Keizer School District, expressed frustration that "there are so many definitions both locally and

nationally about what applied courses are. In some cases they really *are* dumbed-down courses, rather that courses with increased academic content. Definitions are really a problem. There's no standardization." As Grubb (1991) explains, "Because so many groups with varying purposes have called for integration, the concept means different things to different people."

In one sense, any kind of crossover between vocational and academic education is a step toward integration. It can be found in an action as simple as a vocational teacher finding moments in class to reinforce academic skills or an academic teacher creating hands-on projects to illustrate theoretical concepts. Or it can extend to a totally restructured vision of a school in which the lines between academic and vocational skills become blurred, each type of learning reinforcing the other. Pritz observes that the concept of integration can best be described as a continuum. At one end is "integration of academics *in* vocational education and at the other end is integration of academic *and* vocational education" (Pritz).

Grubb's Five-Step Ladder

A more detailed continuum—developed by W. Norton Grubb and colleagues (1991)—is illustrative of the range of approaches to integration. June Schmidt and others (1992a) adapted Grubb's model slightly and framed it as a five-step ladder encompassing eight models that represent various stages on the continuum.

Model I, "basic infusion," addresses integration at its most basic level by attempting to give students in vocational programs advanced academic skills. The onus is on vocational teachers to incorporate more academic material into their vocational classes, but not necessarily thorough collaboration with academic teachers. Although Grubb and others consider this approach ineffective, some vocational teachers have found it beneficial.

Model II is labeled "advanced infusion." The model describes situations in which academic teachers spearhead the introduction and reinforcement of academic concepts by teaming up with vocational teachers.

In Model III, "applied academics," academic teachers infuse vocational skills into academic classes. This approach usually involves schools' procuring off-the-shelf materials from educational research groups, though vocational and academic teachers may also work together to develop an applied curriculum.

"Curricular alignment," the name given to Model IV, involves integration at the high-school-program level rather than at the individual course level, and both vocational and academic courses are modified. True crossover begins to take place at this stage as both horizontal and vertical align-

ment of the curriculum occurs, and collaboration among staff becomes a key factor.

Models V-VIII fall under the heading "restructured schools." These designs are characterized by significant rethinking of the traditional school framework. They include the "senior project" as a form of integration, the academy model, occupational high schools and magnet schools, and occupational clusters and career paths. Grubb (1992) notes that although the approaches are similar, they differ in terms of scale.

In the senior-project model, the curriculum is designed to "develop skills in independent work, problem solving, and presenting results and findings to others" (Schmidt and others 1992a). This program asks students to do something both demonstrable and theoretical and also requires them to focus on a particular subject area.

Academies usually operate as schools-within-schools and can cover many different occupational areas, such as health services, business, and so forth. Academies usually involve four teachers working together; math, English, science, and a vocational area of choice are often combined.

Occupationally focused schools are much like the academy, but the scope is schoolwide instead of schools-within-schools. The curriculum tends to be project-centered, and academic and vocational teachers work together to develop appropriate activities.

In the occupational clusters model, conventional educational departments are replaced with departments organized along occupational lines. Sometimes schools retain conventional departments with occupational clusters that cut across departmental lines, often called "career paths." A variant of this is when students elect "majors," often beginning the ninth or tenth grade. Schools with occupational clusters share much with the senior project, occupationally focused schools, and academies, but "*every* student is in one occupational cluster or another, and students can choose among clusters *within* a school, rather than choosing *among* schools, as might happen within a district with numerous magnet schools" (Grubb 1992).

Tech Prep: Building Bridges

If the models described above illustrate the continuum of integration within a school, the concept of "tech prep" extends the continuum out into the community where it becomes linked to the work site, community college, or institute of higher education. Simply stated, the Tech Prep/Associate Degree (TPAD) is an alternative to both the conventional college-prep path and the traditional vocational path. Dale Parnell (1992) defines Tech Prep as a model of integration that combines "competency-based teaching, articu-

lated programs between secondary and post secondary institutions and an excellent foundation of applied academics."

Students select the tech-prep major by their junior year in high school, and they continue for four years developing specific skills in their last two years of high school and then in a community or technical college. Advocates consider this program to be a promising path for many of the jobs that will be opening up in the future. Although the TPAD plan has its roots in the traditional 2+2 programs that relied on agreements between high schools and community colleges, its contemporary form is significantly more focused and of higher quality. The main strengths of current TPAD programs are their reliance on strong partnerships with business and the community, emphasis on highly advanced technical skills, and reliance on a new component of the high school curriculum—applied academics courses. The Southern Regional Education Board, a consortium of fourteen member states, exemplifies the burgeoning integration movement by its steadfast commitment to replacing traditional vocational programs with a tech-prep program of study.

Elements of a Revised Curriculum

The above models and their variants all contain one or more elements of a significantly revised curriculum. Many educators find fault with the fact that the curriculum for vocational and general-track students has been ill-defined. Tech-prep consultant Steve Olczack asks, "Why is it that our college prep kids have a very rigidly defined curriculum set by the state, but we put every other kid who's not in that college prep program into whatever the hell they want?" (Tony Kneidek 1993). A movement toward applied-learning concepts and increased relevance embodies a fundamental shift in both *what* is taught and *how* it is taught.

Eliminating the General Track

Many schools, in revising their curriculum, eliminate the general-track program of study, or significantly reduce the number of students who enter that program. Gene Bottoms and others (1992) assert that "retaining the general track is a major obstacle in improving the high school experience of the 'other' students"; they argue that "the general track preserves a system that fails to prepare... students adequately for either work or further education." Many educators assert that the "watered-down" courses found in most general-track programs neither challenge students nor ask them to focus on a specific area of interest. Schools are now moving to significantly upgrade these courses or replace them with courses that are more rigorous and more

relevant to real life.

Some proponents of integration envision schools moving toward a two-strand approach in which the general-education path is removed and in its place are two basic paths through high school: tech prep and college prep. Like the members of the Southern Regional Education Board, many believe that "there should be no more than two paths through high school and that both should be devoted to teaching all students the essential elements of college preparatory math, science, and language arts" (Bottoms and others).

Bottoms and his colleagues assert that all students should have access to the same core curriculum; differences should occur in the manner in which a course is taught, not in the content itself. Within a core curriculum of college-preparatory essentials, students pursuing a vocational/occupation path would also have access to higher level, occupation-specific skills, while college-bound students would take additional college-prep work.

BASICS: A Map for Charting an Integrated Program

The Center on Education and Training for Employment in Columbus, Ohio, has assembled a resource package that may be helpful to educators who want to develop an integrated program. Called BASICS: Bridging Vocational and Academic Skills, this package "provides the tools educators need to integrate academics and voc ed in their schools."

The package is based on three principles: that teachers must determine where academic skills are in vocational tasks, that vocational tasks allow realistic use of basic skills, and that "neither academic skills nor vocational skills should be taught in isolation from each other" (Pritz and Davis 1990). The resource was developed for use by teachers, counselors, and administrators.

The kit includes materials on keys to successful integration as well as developing programs of study and new teaching techniques. BASICS has been successfully implemented by a number of sites since 1987. Although intended primarily for secondary schools, it has also been used effectively at the middle-school level.

The BASICS program can provide a solid framework for developing an innovative program, but its developers state that dedication and risk-taking of staff committed to bridging the gap between vocational and academic programs are also essential.

Even as a two-strand approach is being implemented in many school systems, it is beset by controversy. Critics fear that removing the general track and replacing it with only two paths may lock students too early into planning for their future and ultimately reduce their options, particularly for minority and at-risk youth. Advocates of the model counter that the two-strand system will increase, not reduce, options by giving all students access to core college-prep material and the choice of going from school to a job, community college, or a four-year university.

Making Connections: Increasing Relevance in the Curriculum

Helping all students to see a greater sense of connectedness between

what they do in school and real-life challenges and opportunities is another hallmark of an integrated curriculum. Without a sense of relevance, many students, especially those in general and vocational programs, lose interest and even drop out. As Bottoms and others note, "Some students... don't even try to learn if they cannot readily see a link between the information and what they are doing or hope to do in life." One administrator asserts bluntly, "Kids don't want to come to school if it's boring. If school were relevant, if school made sense, if school could show kids a way to get a job, they'd stay. It's common sense" (Kneidek).

One way educators can make school more relevant is by increasing the use of applied-learning techniques. Applied learning "combines the essential elements of the college preparatory curriculum with effective learning and problem-solving strategies in a broad technical or business field of study" (Bottoms and others). Applied-learning methods include such strategies as integrating job-related or practical examples into the classroom and using

Motivating Youth to Stay in School

Evidence is accumulating that many of the inherent features of vocational and applied programs can be a significant factor in reducing the high school dropout rate, which sources place at between 25 and 30 percent.

The term *at risk* covers a broad range of youth, ranging from those with a below-average IQ to poor and minority students and those with behavioral problems. Many of these students end up in a vocational or general track because someone questions whether they will be able to handle a rigorous academic courseload. Unfortunately, vocational and general programs as they have been historically fashioned do little to prepare students either for further schooling or for a satisfying job. With no motivation to stay in school, many students in these programs drop out.

A well-designed integrated program, in contrast, contains many features that are found in exemplary dropout-prevention programs. Classrooms that are "more student-centered, more activity based, and more individualized" (Weber 1988) can do much do engage at-risk youth. Motivating students to stay in school while more effectively preparing them for future occupations may provide at-risk youth with unprecedented opportunities for success. Additional classroom practices include:

- whole-language instruction
- interdisciplinary curriculum
- adjusting for learning styles
- cooperative learning
- alternative assessment strategies
- teaming among teachers, students, and departments
- using technology to accelerate learning

(Duttweiler and Shirley 1993)

While "vocational education always has provided opportunities for active learning but too often has failed to integrate academic learning within the vocational context" (Duttweiler and Shirley), integration may combine the best of both worlds by enhancing strategies that keep youth in school while also providing them access to greater academic rigor.

cooperative-learning procedures that combine both group goals and individual accountability.

Activity-based teaching is one facet of applied learning that is intended to improve "students' ability to make connections between the theoretical and the practical" (Susan Bodilly and others 1992). Practices include hands-on problem-solving, cooperative or team-based activities, lessons that require the use of different forms of expression, and projects that ask students to apply knowledge and skills from several domains to produce a product of some kind. In turn, activity-based learning encourages teachers to adopt new roles such as coach or facilitator, and new teaching practices including one-on-one tutoring and mentoring. Some educators believe that a hands-on approach based on solid academic material leads to greater engagement and that students previously assumed to be unable to master this kind of material are able to when it is presented in a new way.

Applied Academics

Applied academics usually refers to a specific set of courses that combine applied-learning concepts with core academic material. Many schools rely on materials developed by the Center for Occupational Research and Development (CORD) in Waco, Texas, or the Agency for Instructional Technology (AIT) located in Bloomington, Indiana. These "off the shelf" materials include such courses as Principles of Technology (applied physics), Applied Mathematics I and II, Applied Biology/Chemistry, and Applied Communication I and II (applied English). All courses emphasize linking theoretical concepts with specific, applied examples usually relating to an occupation.

Although some sites have incorporated these materials into their core curriculum, almost all schools report adapting them to meet their specific needs. Bodilly and others say that all applied academics "teachers reported that they found the state-recommended materials to be too generic... teachers therefore began to develop materials of their own through collaboration with each other." Similarly, Jim Baltimore, vocational director for the Salem-Keizer School District, explained, "We use the CORD materials for our applied academics courses, but we 'tweaked' them a little here and there to better suit our needs." At other sites, teachers use the off-the-shelf materials as a starting point, but work to develop additional materials on their own.

In other cases, teachers collaborate with each other and with members of the business and labor communities to develop innovative applied courses on their own. As Bottoms and others report, "In some cases, applied academic courses have been or are being developed by a state or local curriculum team or individualized teachers for use in one or more schools." Like

many facets of integration, developing new materials relies heavily on teachers working together.

Grafting an Integrated Curriculum

In addition to formally developed applied-academics courses, there are many points of intersection between vocational and academic curriculum, and educators have found a variety of means for crossover. Perhaps the most basic point of contact is determining what academic concepts are embedded in vocational courses and finding ways to emphasize them. Ouellette (1988) points out that "one of the simplest strategies, at least on the surface, is simply to highlight and make more explicit for students the specific academic basic skills that are embedded in the tasks in their vocational program." He describes the Integrated Studies Project at Portland Regional Vocational Technical Center in Maine, in which, through a "mapping" process, academic and vocational teachers worked together to determine what academic skills were already present in vocational courses.

In addition to identifying and emphasizing core academic skills, "It is important for teachers to weave mathematics, science, and communication skills into vocational activities so that students see the connection between the classroom or laboratory and modern technology" (Bottoms and others). One area that vocational teachers now realize needs extra emphasis is reading and communication skills, and there is an effort on the part of many teachers to include more reading of technical materials, written reports, and oral presentations as part of a vocational course.

Although it is given less emphasis, the converse practice—having academic teachers weave more hands-on projects, examples, and applied contexts into their conventional lesson plans—is also effective. A number of educators recommend teachers' incorporation of applied-learning strategies into the traditional academic curriculum. Sometimes the business community assists academic teachers in finding applied examples.

A next step is improved course alignment and content connections, in which both kinds of courses reinforce the other. Bodilly and others refer to this as "vertical and horizontal alignment of the curriculum." Vertical alignment takes place when courses are arranged in a coherent sequence, usually related to broad occupational clusters. With horizontal alignment, courses are offered simultaneously, and "specifically show the application or relationship of one domain to the other" (Bodilly and others). Both forms of alignment can change course content and course scheduling.

Curriculum can also be interwoven in more complex ways. Beck and others (1991) describe a variety of theoretical interdisciplinary curriculums. *Reinforced curriculum* uses supplemental material in short, intense lessons to enrich class content. *Correlated curriculum* refers to two or more teachers

making connections between subjects. *Fused curriculum* results when a new subject is created with content, materials, and applications from two or more subjects. *Broad-field curriculum* is a synthesized branch of knowledge that builds on a number of content areas that relate to a common goal. And *core curriculum* organizes knowledge and learning according to problems identified by either the teacher or the students.

These are some of the theoretical possibilities for the creation of an integrated curriculum. In practice, the creative, collaborative practices of teachers have given birth to an inventive array of specific projects, described in greater detail in chapter 2.

Easing the Transition

In addition to promoting an increased sense of relevance and strengthening the connections between theory and application in the curriculum, many schools involved in integration efforts strive to better prepare students for the transition from school to work or continued education. Improved transition efforts may loosely be grouped in four main areas: greater involvement with planning partners, transition-specific curriculum, transition services, and credentials and certification (Bodilly and others).

Schools involved in integration programs increasingly try to involve parents in planning strategies and let them know about available career paths so that they can help their children make good choices. Businesses and members of the community may become involved by assisting schools with curriculum-building as well as by offering internships, "job-shadowing" experiences, and the like, and by engaging in other school-business collaborative efforts.

Transition-specific curriculum refers to a curriculum based on occupational clusters, career education courses, and articulation agreements with community colleges. At one site, for example, students combine career exploration with an occupational focus as they first "cruise" though different occupational clusters for a substantial time before choosing a "major" (Bodilly and others). Tech-prep is an excellent example of efforts to strengthen traditional articulation agreements between high schools and community colleges.

Transition services include career counseling or career centers in schools where students can gain more information about various careers and job markets and can often sign up for internships or apply for actual part-time jobs.

In many states and sites, credentialing and certification are changing to reflect curricular reforms. The general high school diploma is being replaced in many areas by an outcome-based certificate that indicates a student has

mastered a particular set of skills and/or competencies. Because the outcome-based movement is evolving, educators struggle to reach clear definitions of these new credentials. Said Philip Lang, principal at South Medford (Oregon) High School: "I think we're all trying to figure out the role of a diploma. When someone says, 'I have a certificate of mastery in this area,' does it mean the same thing at one high school as it does at another?"

Crafting a Custom Vision

Although the range of integration efforts is remarkable, Grubb emphasizes that "the most successful programs we have seen have been developed locally—where principals and teachers, both vocational and academic, have forged a vision of what can be done and then cooperated in putting that vision into place" (1991). Schools must base their vision on the needs and resources of the school, and on a focal point that can strongly motivate staff and community.

In a study of eight sites that attempted integration before it captured legislative attention, Bodilly and others observed that schools approached integration with three main motives related to the requirements and challenges of each school. They labeled these approaches *enhanced academics*, *enhanced relevance*, and *enhanced engagement*. The *enhanced-academics* approach sought simply to increase academic content of vocational programs. It was employed in vocational schools that were mandated to hire academic teachers to implement applied academics courses.

Enhanced relevance was the goal at several "mission" schools that wanted to ensure that their students had practical skills relevant for the workplace. A desire for *enhanced engagement* motivated comprehensive high schools in the study to integrate, seeking greater relevance for students and more purpose and authority for teachers.

Pritz (1989) concurs with the notion that schools must develop an individual motive for integration efforts and advises that "the impetus may have to come from the national, state, or district level, but educators at the building level need to believe that the change can result in improved student achievement and teacher performance." She lists factors that have proved to be "rallying points" for schools, including a response to increased graduation requirements, declining vocational enrollment, a high rate of illiteracy and/or unemployment in an area, dropout-prevention efforts, and external pressure for accountability. In addition to these factors, for some schools the mounting research evidence is enough. For example, Jim Baltimore, professional technical education specialist at Salem-Keizer School District, said simply, "We all know what ought to be done for the good of the students."

Although each school must develop its own effective model for an integrated program, a number of educators have identified elements that enhance the probability of success. Overwhelmingly, integration practitioners at diverse schools assert that integration programs rest on staff innovation and collaboration, strong partnerships with business and the community, and unwavering administrative support at every level.

Chapter 2

Breaking Boundaries, Building Teams

One of the most unique and dynamic facets of the integration movement is its reliance on strong partnerships among staff and the community. To facilitate an integrated approach and movement toward applied learning strategies, teachers must learn to collaborate in unprecedented ways. Schools can cultivate fertile relationships with business and industry on several different levels. The role of the school counselor shifts from one-on-one advisor to that of team player, one who is able to collaborate in helping students who may have been neglected before. And involving parents in encouraging and supporting students is even more essential than in the past.

Generating Support for the Vision

Strong partnerships are the cornerstone of integration efforts, and these alliances must be cultivated from the beginning. In generating a schoolwide vision, educators find it helpful to involve a diverse spectrum of the community on planning committees. Advisory boards, which assess needs and establish goals, can include vocational and academic teachers, administrators, parents, members of the business community, representatives of colleges and universities, and students.

At this stage, it is important for school leaders to convince staff and community members that integration can facilitate schoolwide improvement and that the effort will be a long-term priority. As planning teams work to develop a preliminary vision, it is important to share the vision with the larger community by publicizing the purposes and projected outcomes of integration. Participation in planning and shaping the vision is just one strand of a web of partnerships that adds strength and diversity to the restructuring process.

Teacher Collaboration and Innovation

Integration requires that schools completely revise both curriculum and teaching practices. With few preexisting models, teachers are obliged to collaborate to some extent merely to accomplish the integration goals. At most sites, however, even when an integrated curriculum exists, "Teachers reported that they would need to interact with each other to develop the skills and knowledge base needed to become expert at integration.... Neatly packaged materials would not be a substitute for learning though observations and interactions with their colleagues" (Susan Bodilly and others 1992).

Also, integration efforts ask staff to reevaluate their beliefs and give greater respect to vocational education. Whereas teachers may have been skeptical or biased toward one another because they had little contact, collaboration encourages teachers to value one another more "by mixing with and understanding the contributions made by each individual" (Bodilly and others). Learning to interact and collaborate is an evolving process for teachers. June Schmidt and others (1992b) observe that teachers assume different roles as they move through different stages of integration, from cooperative efforts though curriculum strategies to instructional strategies.

Getting to Know You

Because vocational and academic domains of instruction have been separate for so long, a first step for many teachers is simply getting to know their colleagues and becoming more familiar with what others are teaching. As Jeff Adams (1992) notes, "Many teachers said they hadn't really given much thought to their colleagues' work before they experienced an integrated curriculum." Gene Bottoms and others (1992) also state that "one effective way to communicate is for academic and vocational teachers to look at each other's curriculum and visit each other's classroom." Observing others' classes can familiarize teachers with subject areas that may be foreign to them and expose them to different methods of instruction.

Another way to garner information about what others teach is for staff to instruct one another. For example, "Academic teachers can offer workshops to help vocational teachers improve their own basic skills. Vocational teachers can offer minicourses covering occupational skills to help academic teachers relate their instruction to occupational reality" (Sandra Pritz 1989). Teachers may also interact in less formal ways, such as approaching one another privately for help, borrowing materials and texts, or meeting outside of school hours.

Although teachers may initially have reservations about collaborating, in time they usually become more comfortable with mutual assistance.

Teachers can assist one another in discovering where academic skills are embedded in vocational courses and vice versa. For example, a metals teacher may ask an academic teacher to suggest ways of getting students to use indices, or a math teacher may take his students to a carpentry class to show them the principles of geometry in action (Pritz). At this stage, teachers also begin planning together and sharing information about instructional methods and students they have in common.

From these initial efforts, they might move to assisting one another with instruction and dovetailing instruction to ensure that academic skills are approached the same way by both vocational and academic teachers. Teachers may coordinate instruction by not giving competing assignments. Mutual reinforcement of instruction is also effective. As one teacher explains, "The computerized office occupations instructor had already taught a unit on calculating interest. By the time I [a math teacher] taught this in my class, I felt that I was reinforcing. I took what the students had already learned, and I manipulated it in a different way" (Schmidt and others 1992b).

Curriculum Strategies

In the next phase of integration, teachers work together to develop an integrated curriculum. Strategies include planning coordinated assignments, projects, and instructional sequences.

At Dauphin County Technical School in Harrisburg, Pennsylvania, for example, English, social studies, math, and science teachers found a number of ways of integrating the curriculum, including a mutual project where students managed an imaginary rock band and "wrote promotional copy in English, figured costs for the equipment and travel in math and studied electronics in science class" (Paulette Lee 1992).

At Polytech High School in Kent County, Delaware, all students share the same English class, where they read and discuss a play, then stage a presentation of it (Adams). Students from a variety of vocational classes each contribute to some aspect of the production. To create an integrated experience through dynamic projects such as these, teachers must be willing to alter past patterns of curriculum and pedagogy.

In this phase, teachers also move beyond the individual-project level to designing more elaborate undertakings involving coordinated and collaborative instruction. Schools in Minnesota and Wisconsin, for example, created a week-long "exchange program" between the agriculture and biology classes in which agriculture students observed and participated in tissue culturing in the lab while the general biology students were exposed to hands-on learning methods related to water quality. In another activity, the business-management class and the applied-math class jointly examined the viability of a

proposed Frisbee golf course in the community. Both groups used computers; the math class focused on statistical concepts, while the business management students concentrated on analysis (Beck and others 1991).

When teachers begin to blend curriculum in dynamic ways, they often report increased engagement and participation from students as well as a renewed sense of inspiration among instructors. In addition to these benefits, the process of collaborating may be intrinsically beneficial to students. As Bottoms and others point out, "When teachers meet as a group to produce joint learning activities or revise the curriculum, they become role models for students in demonstrating the type of teamwork that contributes to success in business and in life."

Instructional Strategies

As teachers' awareness of the components of an integrated program increases, they often begin to correlate instructional strategies. One method is to find opportunities to integrate both academic and vocational practices. Schmidt describes an auto-mechanics teacher who told students to "write a business letter as a representative of an insurance company who had found violations in an auto mechanics business." Students were asked to outline the safety violations, which had to be "real-world" problems, and then summarize how to remedy them. The teacher believed this method was valuable because, among other things, "it provided an opportunity for me to find out what the students knew without them having to take a test" (1992b).

Another avenue for correlating instruction is cooperative teaching, which includes such practices as joint assignments and grading, common content taught at the same time, and team teaching. At one site, for example, a biology teacher and a health-occupations teacher created, and now coteach, an applied-science course for health-occupations students. The two instructors are paired with the same group of students for two hours and have a one-hour common planning period immediately before the class. With this method, "instructional roles change from day to day—one teacher leads the class while the other provides support, depending on individual academic strengths and the day's learning objectives" (Bottoms and others). A team of teachers at another school describe how they alternate instruction:

> The first day of a unit, we two teachers introduce it together. The next day we start the labs with the auto mechanics teacher taking half of the students to work on the equipment, while I lecture and do worksheets with the other half of the students. This procedure usually goes on for about six days as each unit has about three labs. Then, the mechanics teacher and I pull the students back together and work with them to review for their test on the unit. (Schmidt and others 1992b)

In addition to providing more relevance and interest for students, a team approach may offer students a chance to develop more flexible relationships with teachers. One member of a four-teacher team in an academy setting comments, "We're often the only stability in the student's life. They know the four of us talk, and maybe one of us can establish that special rapport that the three others can't, and we can succeed in keeping the student in school or helping him or her do better" (Lee).

Teachers may also employ people and resources from the community to enhance integration efforts in interesting and dynamic ways.

Partnerships with the Business Community

Feedback from employers has prompted many schools to begin the integration process. One educator admitted that "the event that drove us to action was the complaint of a local employer who hired several of our graduates. He found them unable to speak or write clearly or to understand what they read" (Bottoms and others). The urgent need for a better-prepared work force has caused businesses and schools to recognize more fully how much they are interdependent, and to begin to pool their resources to improve schools for their mutual benefit.

In addition to providing valuable feedback about the performance of high school graduates on the job, the involvement of business and labor can be instrumental throughout the entire integration process. Larry McClure, director of the Northwest Regional Educational Laboratory's Education and Work Program, advises educators, "Don't ignore the power of the business and labor community as partners in the process, because nothing is going to happen without the involvement of the private sector and parents." Local business and industry have contributed by advising schools on critical skills, helping to develop more challenging curriculum, serving as mentors for students and teachers alike, and contributing resources to support integration efforts.

Advising, Evaluating, Advocating

Many sites have benefited by including members of business and industry on advisory panels that assess and make recommendations concerning the kinds of skills that are needed in the workplace. The Southern Regional Education Board contends that "the best committees include employers and representatives of post secondary education." It charges that "curriculum committees that are limited to academic teachers and central office curriculum specialists have difficulty breaking away from the old way of

doing things and tend to perpetuate courses with low expectations" (Bottoms and others).

Business and industry leaders can also function as advocates of integration, helping to promote communitywide awareness of its goals and justifying the need for curricular integration. Bodilly and others describe one school system that began an "adopt-a-school" program in which local businesses became partners with individual schools and provided input into curriculum decisions as well as community involvement.

Helping Teachers Make Class More Relevant

In addition to advising on requisite skills in an integrated program, business and industry can suggest ways of incorporating examples from the workplace and current technology. At one school, teachers match relevant public or private enterprises with particularly challenging units of instruction. In one case, the local community hospital was partnered with a unit on human physiology, while a fast-food restaurant was linked with a unit on nutrition. The goals were to develop some applied-learning methods, have students explore a range of career opportunities, and develop technological literacy by observing first-hand how people in the workplace use tools, materials, and techniques. Teachers studied the daily operation of each business or institution, researched references, went on tours, and interviewed managers. With this new information, teachers created a series of lessons featuring robust learning activities (Kenneth Welty 1990).

Another stimulating example of businesses' contributing to curriculum development was a project called "Taking Charge: Learning Economics

Teachers Learn on the Job

Teachers can benefit from ongoing contact with business and industry in a number of ways. One way for teachers to learn from the business world is through summer industry internships. Ann Farrell (1992) describes a project in which math and science teachers from a variety of sites and grade levels worked for several weeks at local industries, actually becoming part of company teams working on projects.

While they discovered a number of applications they could incorporate into their classrooms, "even more exciting (and unexpected) was the value they discovered in adapting their teaching methods to include more cooperative learning, open-ended problem-solving, writing, and technology in order to better prepare students for careers in business and industry" (Farrell).

Through their internships, teachers were able to see firsthand how valuable teamwork, collaboration, and communication are in the workplace. They also recognized more fully the importance of being able to solve open-ended problems with no "set" solution, and the need for students with diverse interests to be exposed to computer technology. In addition, they identified several personal traits and attitudes that proved to be beneficial in the workplace, such as confidence, willingness to experiment, and poise.

Organizers of the project cite the need to prepare teachers for internships by offering them advanced training and materials as well as simply mentioning activities. With proper preparation, industry internships can give teachers insight into the needs of the workplace, skills to take back to the classroom, and an expanded group of colleagues and professionals with whom they can exchange ideas.

Through Entrepreneurship," a nine-week curriculum developed jointly by the school, the council of economic education, and the local chamber of commerce. In two days, 150 ninth graders visited with 73 area employers. Students interviewed their employer "mentors" about business practices, and the business people in turn were required to ask students' opinions of real work-related problems. The students were enthused about the experience when they returned, and attendance on those two days was 100 percent (Lee).

Sometimes a school's partnership with a business can shape an entire program, not just a unit or individual lesson plan. An example of this is Boeing's wholehearted support of the tech-prep effort in Washington State. The company has given generous grants to school districts to develop applied academics; it has also sponsored community colleges to work on articulated tech-prep agreements. In addition, Boeing has offered internships to high school teachers, will soon add internships for interested community college faculty, and plans to offer internships to 300 high school juniors. A similar curriculum link can be found in the partnership between Grant High School in Portland, Oregon, and Good Samaritan Hospital.

Education Is My Business: Business People as Mentors and Instructors

Another important function of the business community is serving as mentors and instructors to both high school students and teachers. Students, especially those at risk, benefit greatly when members of business and industry volunteer to be their mentors.

Bottoms and others describe a program in which volunteers from local companies provide students with extra help with their schoolwork. The school provides training and orientation to the new mentors, including tips on building students' self-esteem. Similarly, in Coos Bay, Oregon, a network of employers mentor and provide hands-on learning opportunities for students (Northwest Regional Educational Laboratory 1994). In addition, "Companies can offer learning apprenticeships, workshops, and tours to help students and teachers make connections with the day-to-day realities of offices, shops, and other work settings" (Bottoms and others).

Investing in the Future

Business and labor can also support schools by donating time, money, and materials. Such things as guest speakers, tours, or field trips would fall in the "time" category. Private grants from companies can significantly boost funding. Bodilly and others mention one site where local businesses were inspired to set up a foundation to help the school. They secured over five-million dollars in equipment and labs. Other schools report that as their contact with the business world increased, so did offers of support.

The Developing Role of the Guidance Counselor

Although school-guidance counselors have the potential to be an important part of the integration process, their role is often overlooked by educators. Rich Feller and Joe Daly (1992) note that "the rhetoric of education reform has largely ignored the counselor's role. Most national school-reform studies do not mention that counselors have long argued for the structural and curriculum changes that need to accompany the integration of academic and vocational education."

Others argue that counselors have historically taken an unsupportive view and given little attention to noncollege-bound students. Counselors at some schools where integration is taking place concede that they have little awareness of what integrated programs have to offer and sometimes even steer kids away who show an interest. At many schools, "Counselors, along with most teachers and the community, share a schooling for university focus" (Bodilly and others). Consequently, vocational programs and integrated programs are inadequately promoted.

Too Many Issues, Not Enough Options

Guidance counselors often struggle with the problem of how to address the wide range of issues they are asked to respond to. After dealing with students' social and emotional problems many counselors have little or no time left in their schedule to discuss the merits of integrated programs. In many schools the resources available to counselors are aimed at helping young people gain admission to college; noncollege-bound youth are less likely to initiate meetings with counselors or to follow through on their advice. Further, until now counselors had few viable alternatives to offer students in vocational and general programs. With few options to choose from, many counselors thought they were helping students to find a comfortable niche by placing them in nonchallenging courses.

Regardless of their position on academic and vocational integration as a school-reform concept, counselors are inadequately serving more than half the student population if they are unaware of the new skills needed in the workplace and if they fail to recognize that a course of study that includes some vocational classes is an excellent way to obtain those skills. Feller and Daly cite dozens of reports that describe the "new basics" as "skills in group effectiveness, goal setting, problem solving, initiative, responsibility, self-esteem, and sociability." They affirm that worker success depends on more than job-specific training and that student success depends on more than high SAT scores. Counselors must learn to guide all students toward optimum choices.

Learning To Help All Students

The traditional role of the guidance counselor changes dramatically when integration is implemented on a schoolwide level. To help develop a plan for the noncollege-bound, counselors must first become informed. A counselor can serve as a useful liaison with the business community by determining what skills are really needed in the workplace and helping to coordinate work-experience programs and internships. Seeing how well alumni are faring in the job world and identifying any skill deficiencies that may exist is another important way to gather information.

Instead of focusing only on what courses students need for college admission, schools whose curricular focus begins to shift due to integration realize that students need information about possible occupations and what relationship the courses they take in high school have to future career paths. Grubb (1992) observes that schools with an occupational focus "have all improved their career guidance and counseling. Some have hired more counselors, but they have also experimented with novel approaches, including introductory modules and student projects related to career alternatives."

There are many ways for counselors to bolster career-exploration programs, given today's resources and technology. The National Career Development Guidelines, for example, offers counselors "a detailed listing of competencies all students need to succeed in the workplace" (Feller and Daly). Students can also be encouraged to take advantage of computerized career-exploration programs.

Facilitating Change

In addition to helping students directly, counselors can function as a liaison among teachers, parents, and administrators. Counselors and teachers need to work together to help vocational students understand options for postsecondary schooling. Counselors can assist teachers by discussing individual students' strengths and weaknesses and by encouraging teachers to reinforce the need for students to take more high-level courses. Counselors can also help to identify students who may need extra help in the newly upgraded programs. In addition, they can facilitate communication between academic and vocational teachers.

Guidance counselors can also serve as valuable community spokespersons. It is critical to get parents and community members involved in any school-improvement effort. Counselors can develop programs that educate parents as well as students about the skills needed in the workplace. They can also be key communicators of the plan and its rationale by working with students and parents on an ongoing basis. Counselors can spearhead the campaign to provide students and their parents with information about the

need for a more challenging program of study.

Administrators can seek assistance from counselors in endorsing the removal of structural constraints that impede integration. Advocating the elimination of the general track is an important first step. A mundane but significant task for counselors is to assist in the revision of student-guidance materials and school literature concerning course requirements. Record-keeping is also important. Counselors can assess and record student performance and make discoveries about aptitudes, as well as keep track of the impact of integration on student performance.

These kinds of collaborative activities are critical if counselors are to meet the changing needs of today's students. The days of one counselor serving a whole school of young people are coming to an end. What's needed is the counselor as a key member of a guidance team that includes teachers, administrators, members of the business community, and parents.

Involving Parents

By now many people are well aware of the impact a student's home environment has on his or her learning and development. Bottoms and others confirm that "the amount of encouragement and support children receive at home can make the difference in whether they set their sights high or settle for 'getting by'." Most schools are engaged in ongoing efforts to involve parents in their children's education. Sites pursuing integration stress that parent support has never been more critical. Promoters insist that "people don't 'get' to be involved, they have to be involved" (Tony Kneidek 1991).

Parents need to be informed of new curricular strategies, higher expectations of students, and the increasing emphasis on links between school and life beyond school. Parents can be instrumental in helping students to plan for and to meet the challenges of an improved curriculum, as well as encouraging their children to carefully consider their long-term career goals. Whether or not they had access to a college education, many parents perceive a college-prep track as the only route to occupational success.

Many studies show that parents want to participate in school activities but often feel uncertain or unwelcome. In many cases, these feelings are well founded. Schools must be sincere in their desire to include parents and must go the "extra mile" to make them feel welcome. Homer Kearns, superintendent of the Salem-Keizer School District, noted that it is counterproductive for schools to seem to invite community participation but not really be willing to share. He stated, "If a person were trying to involve the community, but did not believe down deeply that the community truly has a stake and truly has a part in making decisions, then it would be very difficult to be

sincere and make it happen effectively over the long haul" (Kneidek).

Strategies that many schools employ to involve more parents in the process include widespread publicity of school events in local media, personal letters and phone calls to parents, newsletters, open-house programs, as well as unrehearsed regular days where parents can see a real class in action. Schools also provide opportunities for parents to discuss students' progress with teachers outside regular school hours (The Parent Institute, cited in Bottoms and others).

In addition to supporting, advising, and encouraging their children, parents can participate in integration in another valuable way: as workers and employers. Historically, schools have done little to tap the wealth of skills and information that parents possess. The Parent Institute advises educators to "tap the vast parent resource pool every school has—parents who have lived overseas, who speak other languages, who have jobs that use skills schools are trying to teach students, who have hobbies that fit into the curriculum" (Bottoms and others).

Pritz notes that parents in the workplace "can assist the effort by reflecting to schools the ways in which basic skills are needed for participatory management, quality control, and teamwork." In their role as workers, parents can facilitate links with the business community and may be able to serve as guest speakers, arrange field trips and tours at their place of work, or even consult with teachers on specific job skills.

Chapter 3

Paving the Way for Change

Integration requires many key players in education to invent unique roles, learn new skills, and collaborate in unprecedented ways. For this to occur, all members of the integration team must receive strong support from administrators. Consequently, the role of administrator also evolves as an integration effort proceeds, and leaders adapt their skills to meet the needs of a school undergoing transformation.

Portrait of a Hypothetical Administrator

Zach Johnson had been a principal for just two years when state legislation required his school to implement an integration program. Once Johnson became familiar with the range of approaches available, he established an advisory committee and began working with members to develop a clear vision of the goals of integration for his school. He stressed to staff and to the community that this restructuring process was not just another "fad" but a comprehensive vision that would be sustained over time.

The most formidable barriers Johnson confronted as he worked to generate support for the vision were inflexible notions people held about what schools "should" be like and doubts people harbored about some students' capabilities. Johnson addressed these concerns by citing successful models of integrated schools and pointing out that cognitive-learning research indicates many students learn better in applied settings. He also referred to economic forecasts that delineated what skills students would need in the future. He invited staff and committee members to visit sites where integration was taking place, thereby giving them a firsthand glimpse at integration in action.

Once Johnson had established a base of support, he set up small teams of vocational and academic teachers to work on restructuring the curriculum

and changing some teacher practices. These teams communicated with the business community to learn about skills needed in the workplace and to be exposed to the latest technology.

At this stage, new barriers arose. Because teachers had never worked together before, they struggled with interpersonal and teaming skills, and felt threatened by one another. Attempts at joint projects were often thwarted by scheduling conflicts. Johnson addressed these issues by adding a common lunch period for teachers to collaborate and scheduling several inservice days and regular afterschool meetings for teachers to "check in." In most cases, once teachers got to know one another and were given the necessary resources, the level of trust and innovation increased and the school climate improved.

As the integrated curriculum began to take shape, Johnson noticed new obstacles arose that needed to be attended to before progress could continue. Since the state had increased graduation requirements, some students now didn't have much time to take vocational classes. Johnson found several ways to allow time for an integrated curriculum, and began working toward a long-term solution with the state. He also faced questions about equivalent graduation credit for applied classes and the shortcomings of traditional testing methods. In addition, Johnson examined research on performance-based testing and worked with the state to establish guidelines for accountability.

When Johnson and the consortium evaluated progress at the end of the year, they conceded that it could take up to five years to see conclusive results of their efforts, but they already noticed more engagement among students and teachers and improved student academic performance. The process has been intense and has required the traditional structure of schooling to be reworked. Johnson knows time and a sustained vision must precede any conclusive results. But, for the first time, Johnson believes his school is doing a good job serving the "other" kids, the noncollege-bound students who until now had been relegated to an uncertain and unpromising future.

While Zach Johnson and his school are fictitious, the scenerio outlined above illustrates what many sites believe to be the most effective administrative practices for facilitating and sustaining an integrated curriculum. Johnson's responsibilities and practices included committing to a vision and sharing it, investing in staff support and development, and working to remove constraints. Education leaders state repeatedly that the most important thing an administrator can do is to establish a positive climate for change. Frequently, this means beginning by identifying beliefs and structures that may impede improvement.

Roadblocks to Reform

Barriers to reform can be both internal and external. Integration efforts can be hindered by ingrained beliefs about the low status of vocational education in our society, placing limits on students' capabilities, and fear of change. System-level obstacles include the need for considerable material and emotional support from administrators. School-level constraints include scheduling issues, lack of adequate resources, and existing regulations.

Low Opinion of Vocational Education

Inherent beliefs about the superiority of academics over labor have led to an institutionalized difference in the status of vocational and academic education in schools. Vocational programs must frequently contend with a lack of resources and little curricular clout; they are often the first to suffer when either time or funding is reduced. Rather than an authentic focus on schooling, these programs are often used as a safe haven for kids with behavioral problems. Sadly, "This low opinion of vocational education is deeply embedded in the institutional culture of American high schools" (RAND 1992).

Further, many educators believe that "by the time students reach high school, varying abilities, motivations, and aspirations of individual students cannot be changed" (RAND). This belief may have its roots in education theory. According to Monika Aring (1993), "Piaget argued that about half of any population does not develop the intellectual ability to handle 'formal operations in an abstract context.' Only now are US education theorists recognizing that many students may learn better in applied settings, something acknowledged all along in most European countries." Convictions about students' differing capabilities are difficult to displace, particularly when they are reinforced by the established practice of tracking in schools. For integration to be effective, not only the curriculum must be changed but the dogma and institutional structures that support it.

Fear of Change

Educational leaders must work with staff to overcome limiting beliefs. Teachers will also need support in overcoming their fear of and resistance toward integration. Many teachers may feel isolated and uninvolved if they are not included in the initial planning phase. Teachers may fear that integration will jeopardize their jobs; those in the vocational sector may assume that academic teachers will be hired to teach applied courses.

Instructors may also be justifiably concerned about an increased

How To Become a "High School That Works"

The Southern Regional Education Board-State Vocational Education Consortium seeks to establish a 300-school network of *High Schools That Work*. Those interested in becoming members must meet the following requirements:

- The site leadership must be willing to commit to a five-year effort to instill the Consortium's Key Practices and to either eliminate or greatly reduce the number of students who complete the general track.
- The local school board must agree to support academic and vocational teachers with staff development, materials, and time to work together.
- The site must be willing to participate in assessment activities to determine baseline data and to measure progress in student achievement.
- The site must agree to be an active member of a state and multistate network for information and idea sharing.
- The site must have the potential to give students access to modern vocational courses in some context, and site leaders must be willing to work closely with employers and community colleges.

Schools or systems interested in joining the network should contact SREB or their state director of vocational education.

Source: Bottoms and others (1992).

workload and reluctant to spend more time than they already do on planning and instruction. In addition, teachers may feel threatened by change and hesitant to work with colleagues from other disciplines, and may be territorial about their subject matter.

Logistical Challenges

Another significant obstacle is the overwhelming amount of capacity-building required to shift to an applied program of study Nearly all instances of successful integration have taken years to implement, and schools need to plan on at least a five-year process. Peter Miller, principal of Bend (Oregon) High School, noted that a big challenge is "having the *time* to do it right. We can't just shut down for a year, retool, and then start back up again."

Administrative support must be constant, as integration requires a major investment in staff development and teacher retraining, continuing curriculum development, and creation of new curriculum materials and tests. In addition, funding must be sustained. While inducements or grants may get an integration project under way, many times enthusiasm dissipates as funding declines.

Obstacles at the school level include such issues as scheduling difficulties, regulatory concerns, and assessments. Time constraints are a formidable barrier. Research indicates that "the traditional time structure imposed in schools many not allow the flexibility needed for integrating some classes" (Schmidt and others 1992a).

Graduation requirements and college-entry requirements often do not allow equivalent credit for upgraded vocational courses or applied-academics courses. Many vocational classes at comprehensive high schools are only offered as electives, which means some students can't fit them into their schedules and meet graduation requirements, too.

Measuring student performance is also problematic. Jeff Adams (1992) explains that "it's difficult to measure student progress because there isn't any national standardized test or other database to go by." Schools seeking to develop their own assessments must contend with issues of consistency and accountability.

Blazing the Trail

Administrators must take the lead in committing to the vision of change and convincing others that it is both achievable and worthwhile. They must display commitment to the concept of integration, let teachers know of administrative support for changes in instruction, and model their commitment through their actions.

Many administrators report that an effective way to generate support for integration is to send staff to sites that have already made a shift to applied-learning approaches. Seeing an integrated program in action often allows staff members to reexamine previously held beliefs about the value of applied skills and the potential of students in vocational programs.

The best thing administrators can do to overcome limiting attitudes is to create a nourishing environment for change. Darrell Tucker, principal of Grant High School in Portland, Oregon, said he believes administrators do best by "creating an atmosphere where it's okay to work in different ways, and getting teachers to feel like it's okay to take some risks."

Most administrators emphasize that they didn't try to force the concept on teachers, but rather tried to engage them as equal partners in the process. Guido Caldarozzo, principal of McKay High School in Salem, Oregon, emphasized that integration "can't be pushed from the principal down to the staff. It's got to be a staff-generated, community-supported program." A number of administrators said that they initially chose pace-setting faculty members to become involved who would in turn encourage others to get involved.

Handling Teacher Concerns and Resistance

Administrators must be prepared to deal with teacher concerns. The biggest one is fear of job loss, especially for vocational teachers. Whenever possible, administrators must emphasize that shifting to an upgraded program will not lead to staff cuts. Rose explains that although "at first glance the program appeared threatening to vocational staff" at his school, these teachers were assured that applied-academics teachers would move into vocational areas only when the current instructor retired, resigned, or moved to another

position on the staff. Although approximately 75 percent of the programs at this school have the applied-academics option, no vocational teachers have lost their jobs (Dennis Rose 1988).

Teachers may also feel threatened, uncertain, and out of their element when it comes to teaming up. The best thing for administrators to do is accept the feelings as normal and create opportunities for teachers to get to know one another. Most school leaders say that the key to overcoming teachers' reluctance to work together is time. Repeatedly, schools report that while teachers may have been reluctant or even hostile at first, with time interactions become both amiable and productive.

Staff members may also be very concerned about the increased workload and whether they will be compensated for extra work. Again, allowing time for adjustment is a major way for administrators to help teachers feel less overburdened. While administrators at the school level may have little control over whether teachers can be given extra monetary compensation such as summer pay, stipends, honorariums, or incentives, they should make every effort to lobby for such compensation.

Whether or not extra pay is available for teachers, administrators must find ways of letting teachers know that their efforts are not taken for granted. Publicizing teacher efforts in local media, writing letters of commendation for inclusion in their permanent file, publicly recognizing teachers at special events, and giving positive feedback are all important ways that administrators can compensate teachers for their extra time and effort. Darrell Tucker, principal of Grant High School in Portland, Oregon, stated, "When we came back to school this fall, we had a staff celebration of all the different, innovative kinds of things that staff had created. It brought the people who had been resistant to a new level of excitement."

Jim Baltimore, professional-technical education specialist at the Salem-Keizer School District, stressed the need for moral support from administrators. "Where there has been some success," he said, "there's been great moral support from administrators. You've got to have ongoing encouragement. Don't just pat them on the back and then say 'go do it.' Especially when there are no other incentives, staff really need support."

Investing in Staff Development

Related to overcoming staff concerns is the need to provide teachers with the resources to develop new skills. Integration requires a significant investment in staff development from schools. Teachers will be expected to innovate and work together in unfamiliar ways. In some cases, "Even though teachers have tremendous amounts of energy and enthusiasm, they don't necessarily have good interpersonal skills" (Adams). The best thing adminis-

trators can do is to provide staff with time, resources, and occasions for growth. In answer to the question "How did you get teachers to accept that level of involvement?" administrator Steve Olczak responded:

> What I didn't do was go into my staff and tell all 65 teachers,"Ladies and gentleman, I've just come down from a mountaintop and I have this tablet. So tomorrow we're all go to start doing things differently." You just go class-to-class, teacher-to-teacher, and start providing opportunities for them. (Tony Kneidek 1993)

Peter Miller, principal of Bend High School, added, "Don't push too hard too quick. You must rely on the strength of your staff, and you can't force people. Teachers don't want to be told, they want to be educated. You have to be patient, and just keep moving ahead."

A simple but effective way to get teachers together is to examine their proximity to one another. Sometimes "the way large high schools are organized makes it almost impossible for an academic and vocational teacher to pursue common instructional goals for students they both teach" (Gene Bottoms and others 1992). Removing the physical barriers between teachers can be an important first step toward collaboration.

Susan Bodilly and others report that "without exception, teaming and non-instructional time were rated highly as practices to support collaboration toward the building of a new curriculum" (1992). Suggestions for school-based staff development include observing outstanding practices in another classroom or school, providing common planning time, and excusing teachers from regular classroom duties to meet in teams for curriculum development (Bottoms and others).

Other examples include workshops conducted by a visiting consultant or locally trained educator, a "technology fair" to introduce faculty members to new kinds of technology used in the workplace, weekend retreats, year-long staff development on a single topic, teleconferences, and summer programs to provide teachers with contacts in the business world. Some leaders report success in working with the business community to find sites where teachers can work for a brief period during the summer. Another recommendation is to submit applications for grants to encourage independent-growth projects among staff.

How Best To Support Staff: A Mixed Message

While working to facilitate collaboration and team-building among staff, administrators also need to respond to teachers as individuals. For some, greater empowerment and independent experimentation are the key to motivation. Other staff members may need to be urged more and given more continuous feedback and guidance.

Dan Kuzlik, director of community relations for the Salem-Keizer School District, described how some teachers may need more guidance in incorporating curriculum input from businesses. After spending time "job shadowing" to get ideas from the business community, he observed that "some teachers come back to the classroom and say 'Okay, I'm doing just fine the way I'm teaching it.' And maybe they are and maybe they're not." Kuzlik emphasized that making various practices and approaches work together is an ongoing challenge. When staff members begin to experiment independently, "it's good in that it allows you to incubate ideas, but once the ideas are developed, they must be brought back and institutionalized."

Teachers affirm the need for administrative support but acknowledge that they have mixed feelings about the kind and amount of support they want. One staff member remarked, "Projects like this need someone in charge, someone to check with teachers and ask how the projects are going" (Schmidt and others 1992b). Another teacher commented, "When administrative support for change is weak, nothing happens; when it is too strong, teachers rebel" (Schmidt and others 1992b).

Removing Roadblocks

In addition to encouraging teachers to grow and to work together, administrators must strive to remove any structural or operational barriers that are impeding progress.

Not Enough Hours in the Day

The lack of sufficient time to initiate and pursue changes effectively is often the foremost challenge for schools. Most leaders recommend pursuing change gradually, and "one very effective way to provide time is to phase in the change over an extended period" (Sandra Pritz 1989). Dan Johnson reminded educators that "we're trying to do something that has not been done in Western Civilization. Some folks appear to have simplistic answers, but we really don't. It could be years before we figure it out."

Scheduling also poses manifold problems. Teachers need help from administrators concerning the issue of reorganizing the curriculum and schedule, and they consistently report not having enough time to work and plan. As Bodilly and others explain, "Because instructional time is limited—by tradition as well as state and union regulations—teachers attempting to bring together two subject domains struggle to decide what gets left out."

Suggestions for how to make more room in the schedule for addressing integration issues include adjusting the school day by instituting an "early bird" or "night owl" schedule, eliminating schedule conflicts by offering

required courses at least twice during the school day, and allowing independent-study options (Washburn and McEwen 1989). Rose (1988) describes how his school inserted an elective period in the middle of the day by adding five minutes at the beginning and end of the day and by shortening each class period by four minutes.

Dealing with Regulatory Constraints

Ongoing regulatory problems include the granting of credit for applied studies and testing and accountability issues. Administrators must work with the state and district central offices to grant equivalent credit for applied courses. Pritz and others affirm that "much controversy can be averted and discord avoided if the most scientific and professional methods available can be employed to document the skills on which applications for credit are based."

The "audit-analysis" approach is employed by the vocational division at the Arizona Department of Education. Using this method, educators compiled a detailed basic/essential skills taxonomy, then coded academic and vocational source materials and compared them for equivalency to the Arizona Essential Skills List (cited by Pritz 1989).

Bottoms and others suggest that administrators "ask representatives of four-year colleges and universities to examine the content and teacher qualifications of applied courses, including observing students and teachers in applied classrooms."

Administrators also need to provide everyone concerned with accurate information on measurable outcomes. Philip Lang, assistant principal of South Medford (Oregon) High School, confirmed that coming up with a workable system of assessment is critical:

> It's not just a question anymore of implementing a program. The assessment piece has to be there. If we don't come up with a credible assessment that the community can understand and accept, we're going to find ourselves five years from now really hanging out there.

He noted that this is especially important because the population is so transient. The mobility of families makes it particularly important to build programs so that skills and credentials are transferable. Few educators have come up with consistent methods of assessment, and there's a sense that a consistent way of measuring student progress in an applied setting is being developed en route. However, many administrators seem satisfied with progress that is being made on building outcome-based assessment programs and student portfolios.

Conclusion: Proceed with Caution

Integration of vocational and academic education shows great promise not only as a movement in and of itself, but as part of a schoolwide-improvement effort as well as a means to focus other reform initiatives. Sites throughout the country that have already implemented integration report significant improvement in learning as well as greater engagement and a sense of hope and vitality among students, educators, and the community. However, many school-reform efforts and "movements" that showed similar potential have gone by the wayside.

In addition to a sound motive and a well-designed program of implementation, sustaining integration over the long term requires a revision of both internal and external perspectives and consideration of the relevance of reform within a larger social context.

Rethinking School Structures

Integration isn't simply another "program" but a comprehensive school-improvement effort. It's crucial that educators understand how restructuring will change other dimensions of schools. One of the structural issues that must be critically examined is the sanctioned belief that tracking is necessary and inevitable. This practice is being viewed with increasing criticism because it is often based on "judgments about the ability and motivations of different racial, ethnic, and social class groups" (RAND 1992).

Equity issues should be seriously examined, especially when considering the historical relationship of minorities to vocational education, and gender distribution within certain occupations. Olczak concedes that "it's a real challenge to break down the old ways of thinking... the male/female, traditional occupational patterns in our tech prep program are overwhelming,

even though we recruit kids in middle school" (Tony Kneidek 1993).

With the two-path system coming under heavy criticism, perhaps it is time for educators to take the concept of integration one step further, and to consider building a holistic system of education in which academic and vocational skills are genuinely intertwined.

If a school is already involved in other reform efforts, linking vocational and academic programs can provide an effective way to focus and strengthen other school-improvement and restructuring efforts. Integration may complement such efforts as site-based management, teacher empowerment, mission-oriented schools, and greater accountability (Susan Bodilly and others 1992). However, integration can only flourish in a conducive regulatory environment. Some researchers suggest that "more permissive regulatory regimes might be counterbalanced by alternative forms of assessment and accountability" (Bodilly and others).

Many educators cite the need for a clear way to measure student achievement and to provide consistency among different districts and sites. So far, however, the integration movement continues to march on, while little headway is made concerning reliable means of measuring progress. Assessment issues should be given higher priority before further restructuring continues.

Although this process requires enormous effort and investment of energy, some erroneously contend that teachers should simply proceed with integration because it's part of their job, a job for which they are being generously compensated. This attitude is unlikely to foster the willingness and inventiveness that teachers will be expected to summon. As Jim Baltimore, professional-technical education specialist with the Salem-Keizer School District, explained, most teachers are already giving extra time, extra effort, and extra dedication "just because they're good people." Teachers must be provided with incentives, compensation, and support. This is a teacher-centered movement, one that is doomed to fail unless teachers are given necessary encouragement and respect.

Reassessing Values

It is not sufficient to restructure only external components of schooling. For this reform to be genuinely effective, educators must revise some of their longstanding values. When people harbor doubts about the abilities of vocational students and vocational teachers, this impedes change. Such beliefs are damaging and must be honestly reexamined.

Biased views about applied learning may be tied to the low regard in which much of society holds the American worker. Many parents encourage

their children to grow up to be doctors, lawyers, or "professionals," but few encourage their children to explore other aspects of labor and industry.

Some critics are also concerned about the amount of emphasis most applied-learning programs place on math, science, and technology at the expense of the arts and humanities. The emphasis in applied settings and school-to-work programs is almost exclusively on useful skills for practical professions. Students in a vocational program should not be denied access to developing self-expression, creativity, figurative thought, and imagination. Although they may not be deemed to have a "practical" use, philosophy, religion, the arts, and humanities contribute just as much to society as do measurable job skills.

Related to this concern is the notion that integration has concentrated largely on boosting academic skills for students in vocational programs, but has failed to infuse academic courses with applied learning. Bodilly and others note that integration can be productive for all types of schools, not just for those with a large percentage of vocational and general-education students. So far, most legislation has done little to stress the incorporation of vocational skills in academic settings. Evidence is growing that applied-learning concepts can enhance learning among all students, and that students who are academically gifted can also benefit from greater emphasis on hands-on, practical training.

Dan Johnson, area director with the Salem-Keizer School District, noted the importance of not just integrating academic material with vocational classes, but integrating both vocational and academic material with other areas of the curriculum. If he could offer just one recommendation to other administrators, he said it would be "to insist that the integration model not just be an integration of a content piece, but should be integrated in the overall curriculum."

As it stands now, the term *integration* is largely a misnomer. Educators argue that a primary reason for this is the need for students to fulfill college-entrance requirements. Johnson asked, "The potential Stanford student.... Is he or she going to get accepted if he or she is spending half the day in an internship?" Johnson believes that "establishing a common understanding between us and higher education" is a prerequisite to truly integrating disciplines.

Jim Baltimore concurs. "Higher education requirements are really a problem. We need to work to get higher education to accept applied courses," he said. If educators accept the premise that applied learning is a viable alternative path to traditional academic skills, then they should strive to develop programs in which the two approaches to knowledge acquisition borrow more equally from one another.

Bibliography

Adams, Jeff. "The Play's the Thing: Integrated Curriculum Makes Even Shakespeare Relevant to Vo-Tech Students." *Vocational Education Journal* 67, 8 (November/December 1992): 32-33. EJ 452 469.

Aring, Monika Kosmahl. "What the 'V' Word Is Costing America's Economy." *Phi Delta Kappan* 74, 5 (January 1993): 396-404. EJ 457 200.

Beck, Robert H.; George H. Copa; and Virginia H. Pease. "Vocational and Academic Teachers Work Together." *Educational Leadership* 49, 2 (October 1991): 29-31.

Bloom, Gary, and Arthur Pearl. "Challenging the Assumptions About the Future World of Work." *Thrust for Educational Leadership* 23, 5 (February/March 1994): 10-13.

Bodilly, Susan; Kimberly Ramsey; Cathleen Stasz; and Rick Eden. *Integrating Academic and Vocational Education: Lessons from Eight Early Innovators.* Berkeley: National Center for Research in Vocational Education, University of California, Berkeley, 1992. ED 353 407.

Bottoms, Gene; Alice Presson; and Mary Johnson. *Making High Schools Work Through Integration of Academic and Vocational Education.* Atlanta, Georgia: Southern Regional Education Board, 1992. ED 352 549.

Boutwell, Clinton. "Will the Jobs Be There?" *Thrust for Educational Leadership* 23, 5 (February/March 1994): 14-17.

Duttweiler, Patricia C., and Linda Shirley. "Start Making Sense: Vocational Programs Reach Students Who Tune Out Traditional Schooling." *Vocational Education Journal* 68, 5 (May 1993): 22-25. EJ 465 049.

Farrell, Ann M. "What Teachers Can Learn from Industry Internships." *Educational Leadership* 49, 6 (March 1992): 38-39. EJ 441 172.

Feller, Rich, and Joe Daly. "Counselors Tackle the New Basics." *Vocational Education Journal* 67, 2 (February 1992): 24-25, 55. EJ 438 712.

Grubb, W. Norton. "The Challenge to Change: Models for Successfully Integrating Vocational and Academic Education." *Vocational Education Journal* 66, 2 (February 1991): 24-26. EJ 420 875.

_____. "Giving High Schools an Occupational Focus." *Educational Leadership* 49, 6 (March 1992): 36-37, 40-41, 43. EJ 441 171.

Hull, Daniel M. "Tech Prep: More Than Articulation." *Insider* (September 1991): 45-46.

Kneidek, Tony. "A Blueprint for Tomorrow's Workforce." *The Promise of Tech Prep: A Special Report.* Portland, Oregon: Northwest Regional Educational Laboratory, March 1993. 8 pages.

_____. "Coos Bay To Become National Model for Career Education." *Northwest Report.* Portland, Oregon: Northwest Regional Educational Laboratory, January 1994. 8 pages.

Lee, Paulette. "The Dream Team: Four Teachers Savor the Ultimate Classroom Experience." *Vocational Education Journal* 67, 8 (November/December 1992): 30-31, 72.

Olson, Lynn. "To Sell Vision of Student Mastery, Oregon Fights Finances, Skepticism." *Education Week* 11, 38 (June 10, 1992): 1, 16, 18.

O'Neil, John. "Preparing for the Changing Workplace." *Educational Leadership* 49, 6 (March 1992): 6-9. EJ 441 164.

Oregon State Board of Education. *Oregon Tech Prep/Associate Degree Program: Developing a High Performance Workforce.* Salem, Oregon: State Board of Education, Oregon Department of Education and Office of Community College Services, 1992.

Oullette, Irving J. "The Integrated Studies Project." *Vocational Education Journal* 63, 7 (October 1988): 46-47, 56.

Parnell, Dale. "Every Student a Winner: How Tech Prep Can Help Students Achieve Career Success." *Vocational Education Journal* 67, 4 (April 1992): 24-26, 52. EJ 440 623.

Pritz, Sandra G. *The Role of Vocational Education in the Development of Students' Academic Skills: An Implementation Guide. Information Series No. 340.* Columbus, Ohio: ERIC Clearinghouse on Adult, Career, and Vocational Education, 1989. ED 326 692.

Pritz, Sandra G., and Douglas Davis. "Getting Down to BASICS: A Resource Package with the Tools You Need To Link Academic and Vocational Education." *Vocational Education Journal* 65, 7 (November 1990): 38-39. EJ 417 781.

RAND. "High School Vocational Education: Low Esteem, Little Clout." *Policy Brief I* (Education and Human Resources Program). Santa Monica, California: author, October 1992. 2 pages. ED 351 610.

Rannels, Lynn. "The Place of the Industrial Arts in the Academic Community." *Phi Delta Kappan* 72, 6 (February 1991): 456-57. EJ 421 312.

Rose, Dennis M. "Graduation Credit for Applied Academics." *Vocational Education Journal* 63, 2 (March 1988): 33-35. EJ 366 980.

Rosenstock, Larry. "The Walls Come Down: The Overdue Reunification of Vocational and Academic Education." *Phi Delta Kappan* 72, 6 (February 1991): 434-36. EJ 421 307.

Schmidt, B. June; Lois A. Beekan; and Carol L. Jennings. *Integrating Academic and Vocational Education: Guidelines for Secondary School Principals.* Berkeley: National Center for Research in Vocational Education, University of California, Berkeley, 1992a. ED 355 424.

Schmidt, B. June; Curtis R. Finch; and Susan L. Faulkner. *Teachers' Roles in the Integration of Vocational and Academic Education.* Berkeley: National Center for Research in Vocational Education, University of California, Berkeley, 1992b. ED 352 485.

Silberman, Harry F. "The Unfinished Agenda Revisited." *Vocational Education Journal* 63, 7 (October 1988): 38-40. EJ 378 437.

Washburn, John S., and Thaddeus McEwen. "Fifteen Ways to Make Time for Vocational Education." *Vocational Education Journal* 64, 6 (September 1989): 42-43. EJ 398 622.

Weber, James M., "The Relevance of Vocational Education to Dropout Prevention." *Vocational Education Journal* 63, 6 (September 1988): 36-38. EJ 357 863.

Welty, Kenneth. "Making It Relevant." *Vocational Education Journal* 65, 7 (November 1990): 30-31. EJ 417 777.

Interviews

Baltimore, Jim, Professional-Technical Education Specialist, Salem-Keizer School District, Salem, Oregon. Telephone Interview, September 19, 1994.

Caldarazzo, Guido, Principal, McKay High School, Salem-Keizer School District, Salem, Oregon. Telephone Interview, September 15, 1994.

Johnson, Dan, Area Director, Salem-Keizer School District, Salem, Oregon. Telephone Interview, September 19, 1994.

Kneidek, Tony, Writer and Editor, Northwest Regional Education Laboratory, Portland, Oregon. Telephone Interview, September 15, 1994.

Kuzlik, Dan, Director of Community Relations, Salem-Keizer School District, Salem, Oregon. Telephone Interview, September 15, 1994.

Lang, Philip, Assistant Principal, South Medford High School, South Medford, Oregon. Telephone Interview, September 15, 1994.

McClure, Larry, Director, Education and Work Program, Northwest Regional Educational Laboratory, Portland, Oregon. Telephone Interview, September 14, 1994.

Miller, Peter, Principal, Bend High School, Bend, Oregon. Telephone Interview, September 16, 1994.

Tucker, Darrell, Principal, Grant High School, Portland, Oregon. Telephone Interview, September 15, 1994.

Oregon School
Study Council
University of Oregon
1787 Agate Street
Eugene OR 97403

Nonprofit
Organization
US Postage
PAID
Eugene OR
Permit No. 63

OSSC BULLETIN