SCHOOL-TO-WORK FOR
THE COLLEGE-BOUND:
STRATEGIES FOR MAXIMIZING
THE EDUCATIONAL OPPORTUNITIES
OF SCHOOL-TO-WORK STUDENTS

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EXECUTIVE SUMMARY

Guided by the principles of the School-to-Work Opportunities Act of 1994, the school-to-work movement has become the cornerstone of an ambitious national initiative for systemic education reform. The school-to-work system was to include three components: (1) school-based learning, (2) work-based learning, and (3) connecting activities. In addition, the systems were to integrate academic and vocational education, link secondary and postsecondary education, and fully involve the private sector. The idea behind the strategy is that students learn best through the application of academic concepts to real-world situations. While igniting enthusiasm around the country, much of the effort surrounding the school-to-work movement has focused on the need to distance itself from the negative stigma of vocational education. To move the reform into the mainstream, proponents have made the case that school-to-work would benefit *all* students, including the college-bound.

Using published reports and past research experience, researchers from the Institute on Education and the Economy (IEE) identified states that have been particularly successful and creative in expanding the school-to-work agenda. To examine and analyze the work of these programs, IEE researchers conducted telephone interviews with local school-to-work coordinators and staff members and state school-to-work officials in sixteen states--Colorado, Florida, Indiana, Iowa, Kentucky, Maryland, Massachusetts, Nebraska, New Hampshire, New York, North Carolina, Oklahoma, Pennsylvania, Vermont, Washington, and West Virginia.

Authentic Teaching and Learning

The first part of the report discusses the connections between standards, "authentic teaching and learning" pedagogy, and school-to-work efforts. Many schools have attracted college-bound students into school-to-work activities by emphasizing authentic teaching and learning beyond a career orientation. These programs are more concerned about the outcome of the learning process than with where the learning takes place. Their goal is to ensure that students can apply abstract principles to real, often unique situations.

Many academic and workplace reformers recognize the importance of standards in preparing individuals for the demands of the 21 st century. Moreover, most business and academic leaders

support the growing belief that standards should emphasize the *application* of knowledge and skills to the same extent that they emphasize their *attainment.*Many programs and states around the country promote school-to-work and standards simultaneously. Given something as tangible as standards, many feel that opposition to school-to-work from constituencies such as postsecondary institutions and parents can be minimized.

The experience in many states indicates that standards-driven reform must dedicate equal effort to developing assessment tools that provide valid measures of competency to often-skeptical constituencies. While the experience of some states indicates that these kinds of assessment vehicles could be difficult to develop and implement, they have the potential to drive the curriculum and ensure a place for school-to-work in mainstream reform. Because students are not accustomed to taking activity-based exams that may involve teamwork, moving from the old system of content-centered standards and assessment may cause a temporary dip in the performance of students. The battles over these changes can be minimized if the standards are accepted and understood.

To nurture the evolution of school-to-work into the reform mainstream, many programs shy away from the usual school-to-work terminology. Indeed, they envision their efforts as being driven by broader goals than those expressed in the school-to-work principles. The main difference between these programs and others that have been less successful in involving college-bound students is that they attempt to maintain, at least at first, some aspects of a traditional framework--one that college admissions officers, students, and parents can understand. These programs, which call themselves "works in progress," are developing a school-to-work culture slowly, keeping in view the overriding goal: a more academically rigorous and applicable education for all students.

Thus, although many of these programs do not meet the exacting standards established under the School-to-Work Opportunities Act for placing students in work-based learning experiences, two features nonetheless offer great hope for expansion. The first is the development of a strong foundation or philosophy for authentic learning that penetrates all areas of the school. The second is their emphasis on changes in *learning*, not changes in the *venue*for learning.

Programs that attempt to "go to scale" too quickly--before the school, its culture, its staff, and its resources are ready to handle the extra obligations of a school-to-work program--run the risk of sending students into unfulfilling work placements where little, if any, learning takes place. In addition, programs that require full-blown workplace experiences can discourage the involvement of students and parents who want to maintain a balance between traditional and nontraditional learning opportunities. To achieve this balance, the successful programs create a flexible system that allows and encourages students to take part in both the traditional and the nontraditional learning experiences.

Guided Work Experiences Outside the Classroom

The second part of the report explores the various ways programs have used guided work experiences outside the classroom as a way to reduce fears among some constituencies that school-to-work programs are "vocational." First, many programs seek to communicate more effectively about guided workplace experiences, usually without using the traditional vocational education terminology.

Second, successful programs tend to concentrate their energies initially on constituencies that are more receptive to work-based contact. Science and business disciplines, for example, have long traditions of work-based, application-oriented education, especially in higher education. Third, several successful programs emphasize one benefit of guided work experience that is neither a threat nor an obstacle to future success in college or career: the simulation of college and adult experiences.

In many places and situations, the obstacles to school-to-work are substantial. In response to a survey by the State University of New York, four-year colleges in that state said that a student's work-based learning experience or actual employment experience had little influence in their admissions decisions. In Vermont, the state's three selective postsecondary institutions told high school counselors that they base their assessments of students almost exclusively on standardized test scores, classroom grades, and weighted class rank.

Nevertheless, there is a growing interest in the postsecondary community in understanding and developing many of the application-based philosophies and pedagogical strategies that school-to-work promotes. For example, six states are involved in an effort directed by the Educational Commission of the States (ECS) to connect learning and work in postsecondary education. The ECS project stems from an interest in how work and learning are integrated beyond school-to-work and Tech Prep forums, meaning, outside the traditional school-to-work notion. Each state approaches the issue of work and academic integration in a different way.

According to educators in states that have made this effort, there is a primary benefit that guided learning experiences outside the classroom can offer students. This benefit is an opportunity to function as more independent, mature individuals in a controlled environment with a strong support system of teachers and other concerned adults. Offering guided learning experiences to students makes it easier for high schools to emulate the autonomous environment that college students and adults face.

Career and Interest Exploration

The third part of the report describes how successful programs use career and interest exploration to minimize the disconnection between traditional academic courses and the world beyond the school walls. The experience of these programs indicates that offering career and interest exploration opportunities in school need not arouse anxiety among parents, teachers, and students. Indeed, these programs have found that the school's traditional programs, activities, and curricula do not even have to change with the addition of career and interest exploration. Moreover, in many cases, career exploration adds cohesion to the academic courses and motivates students to learn and reflect more.

The programs have included career and interest exploration in one of two ways. Some incorporate career-oriented activities, materials, and concepts into mandatory courses so that all students have the same opportunity to explore and reflect before graduation. This way, school-to-work concepts and teaching methods become a natural part of the traditional work for all students.

Other programs arrange the schedule so that school-to-work courses, while still considered

electives, can be taken without sacrificing the traditional academic courses that the students need for acceptance into selective four-year institutions. Many colleges now look closely at students' senior course selections, and many school-to-work programs are capitalizing on this change, promoting career exploration classes as a way to give students direction and keep them on a traditional college track. Regardless of the particular approach, all of the successful programs had one philosophy in common regarding career and interest exploration--there is no need to differentiate students when offering them the opportunity to explore their interests and ambitions. In short, it does not have to become an "either/or" school agenda.

Conclusions

Much of the effort to advance school-to-work reform has taken advantage of the latitude offered by the School-to-Work Opportunities Act of 1994. Instead of trying to provide an increasing number of students with work-based, school-based, and connecting activities, educators are attempting to reform entire schools and offer a locally tailored, application-oriented, quality education to all students. In many cases, programs with weaker connections to the formal school-to-work concept have greater opportunities to create successful mainstream reforms than programs that adhere too strictly to the school-to-work triad. Below is a summary of the strategies that successful school-to-work programs have used.

- Use standards to promote the same authentic teaching and learning strategies that the school-to-work ideology embraces.

- Become a "work in progress"; work to slowly overcome the misperceptions of school-to-work; and never lose sight of the real objective--the application of knowledge.

- Avoid traditional school-to-work jargon; nurture and seek involvement from constituencies that are already accustomed to the hands-on learning experience.

- Emphasize the idea that using the workplace offers opportunities for students to demonstrate adult behavior.

- Offer postsecondary institutions, parents, academic teachers, and students alternative ways to interpret skills and knowledge; supply options that meet traditional needs while, at the same time, illustrating the richness of skills and abilities that students gain through guided experiences outside the classroom.

- Be more effective with the use of electives that have been traditionally labeled career or interest exploration courses.

- Focus on one philosophy regarding career and interest exploration--that is, that there is no need to differentiate students based on when they choose to enter the workplace; all students will eventually enter the workplace and all can benefit by being offered the opportunity to explore their interests and ambitions.

INTRODUCTION

Overview

For over four years, school-to-work has been a highly publicized and much debated education reform strategy in the United States. Driven primarily by a growing fear during the 1980s that American youth were not prepared to succeed in a rapidly changing world, the reform sought to expose students to a more complete educational experience that combined academic and technical training. In addition to mastering a rigorous academic curriculum, students would gain the ability to apply their academic knowledge in proactive and innovative workplaces that utilize advanced technology and offer new opportunities of a global economy. Originally considered a reform that would be most helpful for high school students who were headed straight into the workplace upon graduation, school-to-work gained its most ardent critics and fans as it evolved into a reform that included, indeed required, the participation of *all* students.

Guided by the principles of the School-to-Work Opportunities Act of 1994, the movement has become the cornerstone of an ambitious national initiative for systemic education reform. Federal legislation not only encouraged local communities and states to change the way they educate all students but gave them the latitude to design their own systems to reflect regional needs. The school-to-work systems were to include three components: (1) school-based learning, (2) work-based learning, and (3) connecting activities. In addition, the systems were to integrate academic and vocational education, link secondary and postsecondary education, provide learning opportunities at the worksite, and fully involve the private sector. All in all, school-to-work was designed as a strategy that offers all students the opportunity to learn the way many experts feel they learn best--through the application of academic concepts to real-world situations. Proponents of the reform believe that every student can benefit from learning about careers and can do so without sacrificing the achievement of high levels of academic skills.

Problems with Acceptability

While igniting enthusiasm around the country, much of the effort surrounding the school-to-work movement over the past few years has focused on the need to distance it from vocational education and its many negative stereotypes.[1] In seeking to make school-to-work reform "acceptable" for all students, proponents have voiced one primary message--career awareness and exposure can benefit students who plan to enter the workplace directly out of high schools to the same degree as students who set out for college with a particular career goal. Indeed, proper information and background regarding the skills and knowledge required to become a productive member of society is necessary for all students regardless of when or how they plan to enter the workforce. Thus, the idea or promotion of school-to-work activities for the college-bound student does not appear as abstruse as many believe. If high academically achieving, college-bound students, their academic teachers, their

parents, and the postsecondary institutions to which they apply could be educated to understand and appreciate the benefits of school-to-work, its connection with vocational education would be minimized if not eliminated. If these groups could accept the idea that school-to-work enhances the academic performance and motivation of all students, the reform would have fewer obstacles to overcome as it moves into the mainstream.

Problems with Accountability

      School-to-work proponents also have to contend with accountability issues--ensuring that students are responsible for the same academic rigor/demands as those required in traditional pathways. In addition, school-to-work systems must ensure that participating students perform equally well (if not better) on both traditional and new, more application-oriented assessments. Without a proven track record of results, parents and even students themselves are justifiably hesitant to offer themselves as guinea pigs when future educational and career options are at stake. Maintaining high levels of student performance while reforms are being developed and instituted is an obstacle that promises to confront reformers as they attempt to promote school-to-work among the mainstream or college-bound population. Moving from the old system of content-centered standards and assessment to a new system of application-oriented instruction and evaluation may cause a temporary dip in the productivity of students. Such a performance dip threatens any potential for school-to-work to become a credible alternative to traditional education modes. Students who customarily score high on traditional exams such as the SAT and ACT are not accustomed to taking activity-based exams that may involve skills such as teamwork and creativity. Reformers must convince teachers, parents, and students that they have their "feet well planted" and can be held accountable before skeptics will make changes that affect students' lives and futures.

Problems with Postsecondary Access

      Before skeptics can be convinced that school-to-work offers a viable education for all students, the system must offer students access to the same (or an even greater) variety of postsecondary options as traditional academic programs. As is the case with many current education programs that are closely tied to "vocational education," many school-to-work students are only offered limited post-graduation options such as community colleges or trade schools. Students that deviate from the normal "Carnegie Unit" curriculum and/or fail to participate in traditional assessments are often not even considered for acceptance into "top" universities. Reformers must work to convince individuals in higher education that the knowledge gained by participation in school-to-work programs is at least equal to that gained in traditional academic courses by using some sort of performance-based comparisons that postsecondary educators find valid. Postsecondary educators must be convinced that students involved in the school-to-work system can thrive in traditional educational environments to the same extent that they thrive in contemporary, application-oriented environments. Parents and students themselves will be more prone to lend their support to school-to-work if adequate post-graduation options are accessible to school-to-work students.

      The overall purpose of this paper is to provide readers with solid examples of how local and state educators have begun creating environments that encourage the participation of all students in

school-to-work experiences. All of the systems and programs highlighted in this paper appear cognizant of the problems associated with moving school-to-work into the mainstream: accountability, acceptability and postsecondary access. They are all working to overcome these obstacles in creative, cohesive, and innovative ways. Some of the environments mentioned below have progressed well beyond infancy; others are only beginning their journey towards meaningful change. In some cases, educators proudly refer to their activities in a school-to-work context. In other cases, educators shy away from using school-to-work terminology that often limits broad-based reform efforts. What unifies all of the efforts that are discussed below is their willingness to work within the current system in order to expand the opportunity for all students to participate in a more application-oriented educational environment that uses what have come to be known as school-to-work strategies.

Paper Organization

Commonly, terms such as school-based learning, work-based learning, and connecting activities are used to describe school-to-work. However, this usage may actually keep school-to-work within the traditional vocational education framework, exacerbate the misperceptions surrounding it, and, thus, keep the reform from moving into the mainstream. In January of 1997, the Institute on Education and the Economy (IEE), with funding from the National Center for Research in Vocational Education and the IBM Corporation, published a document entitled *School-to-Work for the College Bound* (Bailey & Merritt, 1997)to address many of the issues that may have thwarted the movement of school-to-work into the mainstream. The authors concentrated on three broad, commonly misconceived principles that the reform seeks to promote: (1) authentic teaching and learning, (2) guided experiences that take place outside the classroom, and (3) career and interest exploration.

Authentic Teaching and Learning
Over the last decade, support has grown for the development and implementation of student-centered teaching strategies that more fully engage students and teachers in the learning process. Through a more authentic mode of learning, students are required to think independently, develop in-depth understandings, and apply academic learning to important real-world problems (Newmann & Wehlage, 1995). Academic teachers and students who excel in traditional academic courses can benefit from this learning strategy to the same extent as vocational teachers and students. Teachers are given the latitude to work alongside their students and create new and current curricula based on student need and interest. Students who are often disengaged with the rote learning required in traditional courses have an opportunity to bring their interests into the classroom and take responsibility for their learning. Although few would dispute the overall benefits of a learner-centered approach to education, the approach is not free of skeptics who question the efficiency and effectiveness of a system that encourages students to construct their own knowledge, often at their own pace. Although authentic projects allow students to work together and/or alone and develop an understanding of complex situations and the value of learning, skeptics question whether ample material can be covered so that students score well on traditional exams. In addition, many individuals question the need to focus educational efforts on the construction of knowledge if institutions of higher learning are not interested. At the very least and in the initial phases of reform, authentic teaching and

learning can work in tandem with traditional learning and teaching strategies to offer students a richer and deeper education. Its greatest potential, however, lies in the ability to capture the interest and motivation of disaffected students, be they high or low academic achievers.

Experience Outside the Classroom

Inspired by the perceived success of the German youth apprenticeship model, reformers have struggled for decades to promote the benefits of organized, guided work experience, internships, or mentoring relationships outside the classroom. The use of a workplace or industry context can become a motivational tool for all students by demonstrating the value of academic and technical knowledge. Learning applications become real and not contrived; connections strengthen the amount of knowledge that is learned, understood, and retained (Packer & Pines, 1996). Despite the fact that work experience is required as part of the formal training of physicians, lawyers, and professors, many still doubt the benefits of this type of education for high school students--especially those with college aspirations. Indeed, as many professionals have come to realize, effective practitioners must create knowledge and put that knowledge to use--a skill that requires the appropriate experience to gain proficiency. There is tremendous potential for all students who are exposed to experiences outside the classroom if they are allowed to bring those experiences into the classroom for further discussion, application, and development.

Career and Interest Exploration

Often misconceived as an attempt to prematurely and irrevocably "push" students toward one occupation, career exploration can offer students an opportunity to digest realistic information and think systematically about careers that relate to their interests and aptitudes. These opportunities are particularly important for students *before* they start college, not only in terms of assuring that the prerequisite and requisite courses are taken but making students aware of the difficulties and demands of certain careers. Career exploration requires additional time and expertise from school staff such as guidance counselors and even classroom teachers. As the school-to-work model stresses, however, career exploration can make school real and enjoyable for students as they experience the potential for integrating their aspirations and outside interests (even athletics and music) into their academic program.

Bailey and Merritt's (1997) discussion blended theory with application to illustrate how the above principles are embodied in the school-to-work philosophy. The report sought to demonstrate how school-to-work can be used to teach academic skills as well as and possibly even better than more traditional approaches and better prepare students for higher levels of education and competitive careers.

This report takes those principles one step further. It uses them as a framework for presenting some of the strategies that are used by high-quality school-to-work systems and programs around the country. Many school-to-work efforts have been able to incorporate authentic teaching and learning strategies, guided experiences outside the classroom, and career and interest exploration into the educational activities of a wide variety of students--including those who plan to attend competitive

four-year colleges. These schools, districts, and states provide excellent examples of how school-to-work principles have been able to move further into the mainstream and reach a more diverse group of students, teachers, parents, employers, and postsecondary institutions. Those involved in the school-to-work movement have configured their effort, often in creative and innovative ways, to offer students educational experiences that make academics more applicable *and* lead to or enhance the possibility of college acceptance and completion.

This report is divided into three sections. In the first section, the strategies that individual schools and states have used to promote authentic teaching and learning will be discussed. Because many education and workplace standards, apart from any influence by the school-to-work movement, have been transformed to promote an application-orientation, we discuss state standards and how they are being used in many local and state school-to-work efforts to promote reform. How local and state school-to-work efforts are moving slowly, yet deliberately, to develop a strong and wide-reaching understanding and use of authentic teaching and learning will also be investigated. The notion of "guided work experiences outside the classroom" as a way of reducing fears, among some constituencies, that school-to-work programs are "vocational" will be discussed in the second section. Some programs accomplish this task by working with constituencies such as science and business disciplines that have a long-standing history of work-based learning experiences. Others use professional development as a way to establish partnerships with the academic community and employers. Assessment issues will also be discussed. The ways in which programs use career and interest exploration to minimize the disconnection between traditional academic courses and the world beyond the school walls will be explored in the third section. This part of the report shows how a number of programs have included career exploration without a radical overhaul of the curriculum. Programs do this by (1) integrating career concepts into required courses, or (2) redefining elective courses so students can make their own choices. The third section also illustrates how many programs have been successful in avoiding the differentiation of students as "school-to-work students." Each section in this report will be followed by a chart that summarizes the systems and programs discussed and indicates how these systems and programs minimize the obstacles of bringing school-to-work into the mainstream.

Methodology

The data collected for this project comes primarily from telephone interviews with local school-to-work coordinators and state school-to-work officials. Although there are successful school-to-work programs in all states, IEE researchers focused their data-gathering efforts on sixteen states-- Colorado, Florida, Indiana, Iowa, Kentucky, Maryland, Massachusetts, Nebraska, New Hampshire, New York, North Carolina, Oklahoma, Pennsylvania, Vermont, Washington, and West Virginia. While not random choices, these states do cover a cross-section of the U.S. population, representing small and large states dispersed throughout the country.

In telephone interviews, representatives from State Departments of Education were asked a series of questions regarding the history of school-to-work in their state, the involvement of postsecondary institutions in school-to-work reform, implementation of new standards and assessment tools, and professional development activities. State officials were also asked to recommend school-to-

work programs that succeeded in sending students to four-year universities. School-to-work coordinators at these programs were interviewed by telephone in the same manner as state representatives. Program staff members were asked to discuss the aspects of their programs that led to the successful transition of students from high school to four-year institutions as well as the barriers that participation in school-to-work programs have placed upon students who pursue college admission. (See the project's interview protocol in Appendix 1; Appendix 2 contains a list of the programs and individuals contacted.) They were also asked for supporting documentation regarding their programs.[2]

PROMOTING AUTHENTIC TEACHING AND LEARNING

School-to-work embraces authentic teaching and learning strategies to ensure that students gain a better understanding of their world, a better and more in-depth use of skills, and a better grasp and appreciation of the connections between learning and working. Although school-to-work uses authentic teaching and learning pedagogy in the context of careers, the authentic pedagogic approach is not limited to a work or career focus. Indeed, the authentic teaching and learning pedagogy has its roots in the contructivist and developmental theories developed by John Dewey (1966) and most recently made popular by Theodore Sizer's Coalition of Essential Schools (edweb.gsn.org/edref.ces.mems.html).

Many of the schools, school districts, and states that have been successful in attracting college bound students into school-to-work activities have done so by emphasizing the use of authentic teaching and learning beyond a career orientation. These programs or systems appear less concerned about the venue for teaching and learning than the outcome of the process. Their focus is to ensure that students capture the importance of abstract concepts and principles by developing the ability to apply those principles to real, often unique, situations and problems. Although there are many ways to promote authentic teaching and learning, the school-to-work programs discussed here have done so in two primary ways: (1) by using academic standards (many of which are requiring more application) as a supporting infrastructure for school-to-work and (2) by emphasizing the universal, big-picture aspects of school-to-work.

Use Standards as a Supporting Infrastructure for Authentic Teaching and Learning

During the last decade, many academic and workplace reformers have come to realize the importance of standards in preparing individuals and organizations for the demands of the 21 st century. Although there is still debate over the implementation and evaluation of standards, most individuals agree that standards effectively communicate what individuals need to know and be able to do to succeed in new, highly competitive, global environments. Moreover, most academic and business leaders support the growing belief that standards should emphasize *application* of knowledge and skills to the same extent that they emphasize their *attainment.*[3] Having become aware of the growing support for application-oriented standards in both business and academic sectors, many local and state school-to-work efforts are structuring the authentic pedagogy they are developing around these standards.

Although educators and employers have worked largely in isolation to develop standards, the messages they and their new standards communicate are surprisingly similar. Instead of promoting the attainment and regurgitation of disjointed pieces of knowledge and information (as lists of isolated tasks and skills often do), both constituencies are emphasizing the use and creation of knowledge.[4] In their attempts to build high-performance workplaces in which employees work autonomously, employers are emphasizing the use of general employability or SCANS skills and workplace scenarios that combine academic and technical knowledge and focus on broad-based activities such as problem solving, decisionmaking, and resource management. Academic standards in many states now focus on broad skills and the instruction and assessment techniques that will assure that students can learn and demonstrate how knowledge is integrated or applied to various "real-world" situations.

Given the increasingly similar message being communicated through the standards developed by business and education, many states around the country are taking advantage of this newfound cohesion to promote school-to-work and integrated standards simultaneously. The primary vehicle used to drive standards-based, integrated education is authentic teaching and learning--one of the strategies that supports the proliferation of school-to-work. Many believe that applied standards that mirror changes in the real world and have the support of both academic educators and the business community will strengthen the need for and validity of authentic teaching and learning. At the same time, adhering to applied standards will bring something tangible to the school-to-work effort and, thus, minimize the lack of accountability that exists in many systems. In addition, many feel that a strong association with a mainstream effort such as standards-based education will minimize opposition from postsecondary institutions and parents.

Over the past several years, the Department of Children, Families, and Learning in **Minnesota** has emphasized two areas in its reform agenda: (1) new graduation standards and (2) school-to-work. The department's Director of Postsecondary Relations explained that "standards provide the rigor (and) school-to-work provides the context . . . by accomplishing one, you accomplish the other." Another state officer involved with school-to-work noted that the state "could not do what we are attempting to do without standards . . . standards have become the base, the `what' of what we expect an educated person to be." Indeed, many of the program-level educators interviewed in Minnesota feel that legislatively approved standards will guarantee longevity for school-to-work.

Minnesota standards and performance assessments "expand academic content and emphasize application" and focus on "results, not simply on attending class for four years" (children.state.mn.us/grad/WebGSMar.html). Indeed, Minnesota has not had Carnegie Units as a

requirement for high school graduation for several years and is the first state to validate learning that takes place outside the classroom. Parents, teachers, college educators, and business leaders participated in the development of primary, intermediate, middle school, and high school level standards. In addition, the standards have gained support from both the University of Minnesota and Minnesota State Colleges and Universities.[5] The Minnesota Graduation Standards have two components:

1. *Basic Standards:* Basic competencies and tests that comprise the "safety net" or "minimum level of performance" in writing, math, and reading as defined under Minnesota Rules 3501.0030 and assure that all students leave high school with the skills needed to work and live in today's society

2. *High Standards in the Profile of Learning:* Ten broad areas of learning (listed below) that represents academic processes and over-arching ideas. Beginning with the class of 2002, students will be required to complete a series of 24 assignments or "performance packages" (out of a possible 48 prototype packages developed by the state) across the ten learning areas to show a profile or record of their work.[6]

Minnesota: Ten Learning Areas of the High Standards

1. *Read, View, and Listen:* Read, view, and listen to complex information in the English language.
2. *Write and Speak:* Write and speak effectively in the English language.
3. *Arts and Literature:* Apply and interpret artistic expression.
4. *Math Applications:* Solve problems by applying mathematics.
5. *Inquiry:* Conduct research and communicate findings.
6. *Scientific Applications:* Understand and apply scientific concepts and methods.
7. *People and Cultures:* Understand interactions among people and cultures.
8. *Decision Making:* Use information to make decisions.
9. *Resource Management:* Manage resources for a household, community, or government.
10. *World Languages:* Communicate in a language other than English. (See Appendix 3 for a detailed list of standards.)

The application orientation of the Minnesota Graduation Standards offers a natural fit with school-to-work. Although some of the performance packages contain traditional assessments such as paper and pencil tests, every package must include at least one "robust performance task" or structured situation that requires a student to demonstrate his or her knowledge. Students must accomplish a task that allows for multiple responses to challenging questions or problems in a simulated or real-life situation. Districts can modify the sample performance packages that the state has developed or establish their own packages to fit local needs. Districts also have latitude to develop their own tests to measure their students' proficiency on basic skills with validation from the state to ensure consistency.

In addition to the state's basic and high standards, Minnesota is developing "standards of distinction" that extend learning beyond the high standards and build greater specialization and complexity into academic, career-based, talent-based, and interdisciplinary areas. Students can choose to pursue one or more standards of distinction. Each standard will include a description of the declarative and procedural knowledge (content standard) to be pursued, an assessment package that

validates learning beyond the High Standards in the Profile of Learning, and a description of the preK-12 learning experiences that should occur inside and outside of school to facilitate standard attainment.

In an interview, one staff member at the Department of Children, Families, and Learning noted that standards of distinction along with the more application-oriented high standards have implications for a "new kind of kid." Exposed to this new way of learning and demonstrating knowledge, students will become more demanding consumers of education. When implemented, these changes will also have major ramifications for postsecondary faculty members. Working to build a new, standards-based environment that supports interactive and application-oriented learning for *all* students, many program and state level personnel in Minnesota believe that the traditional college lecture style will no longer meet the needs of a new generation of college students. Universities, many feel, will be forced to change to take account of new learning and testing styles.

To be sure, Minnesota's efforts have critics. Faculties in some of Minnesota's schools hope that the application-oriented standards and the school-to-work reform will eventually fade away. These individuals search for ways to adhere to the standards without changing their traditional curriculum. Many programs in Minnesota, however, are using standards and school-to-work to help all of their students attain a rigorous education through contexts that are appropriate for them. They say that they will work towards standards-based, application-oriented reform because it works, not simply because the state requires it. Indeed, many school-to-work coordinators in these programs say that linking school-to-work to graduation standards has proven a successful way to approach more traditional educators--both secondary and postsecondary--about school-to-work and authentic teaching and learning strategies. School-to-work is so closely linked with graduation standards in Minnesota's Red Wing School District that the Graduation Standards Coordinator also acts as the coordinator of school-to-work activities for the entire student body. Considering himself an "older teacher" who once spoke against school-to-work and the new standards, he has become one of the biggest supporters of the school's standards-based "career and academic plan."

The school-to-work effort in **Maryland** has used academic skills and content standards to create a single, seamless K-16 system that supports authentic learning pedagogy and minimizes many of the obstacles that students face as they make the transition from high school to college. Like Minnesota, those involved with education reform in Maryland feel that school-to-work, when supported by standards, can ease the concerns of many parents, academic teachers, superintendents, and postsecondary institutions by ensuring the academic rigor necessary for a wide variety of student options. In the mid-1990s, educators from the Maryland State Department of Education and the University of Maryland Higher Education System (a cross section of all higher education institutions in the state) began working with mathematics supervisors, career and technology educators, the Maryland Higher Education Commission, local education agencies, Maryland Community Colleges, and business and industry. Initially they set out to solve the "big question" of how school-to-work credits could be accepted by the state's university system. In 1996, educators performed a gap analysis that compared skill outcomes from the Applied Mathematics I and II curriculum with exit skills required in Algebra II and Geometry. The applied mathematics curriculum was then made compatible with traditional academic courses in Algebra II and Geometry. The group and additional science specialists continued their efforts by performing similar gap analyses on physics and chemistry courses. Thus, specific content standards were used to remove the barriers that technical courses once

presented to college admission.

The overall product of this partnership has been a "standardization" in general education that makes it easy for students to move throughout the system and attain additional levels of education. Once a public institution labels any course "gen ed" based on a thorough analysis of its content and comparison to applicable state standards, the course is transferable across all institutions in the system. The Maryland system has been so successful that New Jersey has adopted it. The Maryland Higher Education System is now in the process of refining standards and working with high schools to find bridges that will further connect institutions and their curricula.

Maryland has also developed "blended instruction," a standards-driven education reform that "fosters the integration of academic and occupational education." Blended instruction falls under a state school-to-work effort referred to as "career connections" that works to integrate Maryland's "skills for success"[7] and "core learning goals" (the state's academic standards) with state and national industry skill standards developed by employers, educators, and union representatives in various industries and economic sectors. Over 1,000 career, academic, and technical teachers have completed the first "strand" of the blended instruction training process. Below is a description of one integrated project in English and health-bioscience:

Title: The Health of a Nation--Controlling a Virus
Activities: As a part of this project each student will . . .

1. Read *The Andromeda Strain* by Michael Crichton.
2. Be assigned a virus to research--Ebola, HIV, chicken pox, malaria.
3. Research how viruses are identified, isolated, contracted, spread, and prevented.
4. Interview public health officials and health care providers about the virus under study.
5. Compare and contrast various accounts of infectious disease outbreaks--fictional, nonfictional, tabloid, newspaper, interviews, TV scripts, and medical newsletters.
6. Investigate specific protocols for preventing the spread of disease.
7. Develop a public health awareness campaign--newsletters, brochures, and speeches.

The project description lists the academic and industry skill standards that the project addresses; resources and materials to be used (including human resources); expectations of students (including final product); roles for participating teachers (in this case health, bioscience, and English teachers); linkages to industry; timeline; and assessment strategies to determine student mastery of specified standards.

The blended instruction effort is being strengthened by the state's efforts to establish competency- or performance-based education, an effort that has been underway since 1977. The Maryland School Performance Program (MSPP), established in 1990, "challenges schools to boost the ability of all students, first, to learn the basic skills of reading, writing, language usage, mathematics, science, and social studies, and, second, to apply these skills to real-life situations" by using "accountability as the cornerstone" (www.mdk12.org/mspp/reform/). By the year 2004, Maryland's 3

rd, 5 th, 8 th, and 11 th graders will be required to pass a series of end-of-course tests that cover core academic areas (math, science, language arts, reading, writing, and social studies) "as well as general skills for success, which will be incorporated into the other tests" (www.msde.state.md.us/pressreleases/19970827.html). The assessments will be criteria-referenced tests that measure responses by process and answer. For graduation, students "will be required to demonstrate that they can comprehend, analyze, and integrate information in broad subject areas, as well as reason, calculate, and solve problems" (Langenberg, 1997).

Those involved at the state level in Maryland indicate that their primary goal is to integrate standards and real-world applications but not lose academic rigor. Applied skills will no longer be limited to shop classes or career-oriented curricula, and the attainment of academic skills will no longer be the sole responsibility of students going to college. Instead, a wide range of skills will be taught by regular academic content teachers and integrated into regular classes.

As the experience in Maryland indicates, reforms that are driven, even partially, by standards must dedicate equal effort to developing assessment tools that provide valid measures of competency to a variety of often-skeptical constituency groups. **New York** has developed application-oriented "learning standards" that cover seven content areas: (1) math/science/technology, (2) health/physical education/home economics, (3) social studies, (4) career development and occupational studies, (5) English/language arts, (6) arts, and (7) languages other than English. Comprised of phrases such as "acquires the knowledge and ability necessary to . . ."; "access, generate, process, and transfer . . ."; and "design, construct, use and evaluate . . .," these standards, like SCANS skills, invite a career context to make them more meaningful to students and teachers. (See Appendix 5 for a detail listing of New York State Learning Standards.) Unfortunately, lacking a state Regents Exam to measure the application-oriented skills that are found within these standards, many school-to-work proponents in the state fear that these new standards will be easily disregarded in favor of more traditional academic standards. Recently, however, the Commissioner of Education and the Board of Regents have established a clear strategy[8] that places increasing emphasis on student attainment of standards. In addition, the state is placing greater importance on the Regents Exam as the primary measures of student achievement and determinants of high school graduation. By the year 2000, students will be taking new tests designed to measure how they apply knowledge and skills and include writing essays, performing experiments, and making presentations. This type of Regents Exam promises to be quite different from current exams and difficult to develop and implement. It also has the potential to drive curriculum and ensure the proper place for school-to-work in mainstream reform.

North Carolina standards, now being revised on a discipline-by-discipline basis to incorporate applications and more integrated pedagogical approaches, have been given immense weight by the state's strong assessment and accountability system. Indeed, the state's Director of Instructional Services pointed out the "high stakes accountability in the state" when she mentioned the state's yearly publication of high and low performing schools.[9] In addition to traditional graduation requirements in the form of Carnegie units, the state legislature requires the development of statewide K-12 goals and objectives for curriculum and assessment on a grade by grade and course by course basis.[10] Curriculum committees, comprised of academic and vocational educators, postsecondary faculty, parents, and industry leaders, revise the statewide curriculum and assessment in five-year cycles. College professors determine whether the state is on the right track with competency goals and

objectives.

In 1997, the State Board of Education began requiring schools to incorporate programs that better prepare high school graduates for higher education and the world of work, strengthen instruction and assessment practices to ensure they meet world class standards, integrate a system for workforce preparedness, and establish career pathways. The Board established six competency areas--(1) communication, (2) using numbers and data, (3) problem solving, (4) processing information, (5) teamwork, and (6) using technology--in which high school graduates must demonstrate a high level of proficiency. Work is now underway to incorporate North Carolina's proficiency requirements into the state's "ABCs of Public Education" that went into effect in high schools during the 1997-1998 school year.[11] The plan requires schools to be held accountable for the educational growth of their students and gives them control over educational and financial decisions. The Director of Workforce Development Education in Nash-Rocky Mount School District stated that standards would definitely impact school-to-work. Indeed, much of the state's accountability system takes note of comments from employers and postsecondary institutions regarding the need for student improvement in areas such as reading, writing, and math.[12] The standards also establish a strong forum for school-to-work through their application orientation. In effect, the strong infrastructure that supports student performance standards and the ABCs of Public Education work together to promote the same type of authentic learning that school-to-work promotes.

Most of the **New Hampshire** school-to-work directors and regional coordinators who were interviewed during this project considered school-to-work to be part of the state's curriculum framework. One regional director stated that school-to-work is structured so that it can easily be infused into the existing curriculum, not simply added on. The New Hampshire K-12 Curriculum Frameworks are part of a comprehensive state effort of "aligning curriculum, assessment, and instruction . . . (to) increase academic achievement through focused curriculum and improved teaching methods." The effort is being directed under the New Hampshire Educational Improvement and Assessment Program (NHEIAP) which began in 1989.[13] Although the framework exists in four traditional subject areas--(1) English/language arts, (2) mathematics, (3) science, and (4) social studies--the assessments (NHEIAP tests) that are structured around them are designed to evaluate both students' knowledge and their ability to apply that knowledge.

The standards themselves represent many of the principles of authentic teaching and learning. (See excerpts from New Hampshire's Curriculum Framework in Appendix 6.) For example, the K-12 Mathematics Curriculum Framework is organized around eight strands: (1) problem solving and reasoning; (2) communication and connections; (3) numbers, numeration, operations, and number theory; (4) geometry, measurement, and trigonometry; (5) data analysis, statistics, and probability; (6) functions, relations, and algebra; (7) mathematics for change; and (8) discrete mathematics. Within each strand, one or more broad goals are further broken down into a "purpose statement which places the goal in context and elaborates on its role in the mathematics program," as well as a curriculum standard and a proficiency standard (www.plymouth.edu/psc/math/curricula/k12organ.html). Science standards include strands such as Science as Inquiry; Science, Technology, and Society; and Unifying Themes and Concepts and the traditional sub-disciplines of Life Science, Earth/Space Science, and Physical Science. The following excerpt from the Problem Solving and Reasoning Strand in Mathematics illustrates the state's new application-orientation in its standards:

Standard 1a. K-12 Broad Goal: Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content.

PURPOSE: Problem solving should serve as the organizing feature of the mathematics curriculum as well as other areas of study and should be applied to everyday activities. Problem solving must not be seen as a separate topic, but rather the centerpiece of the mathematics curriculum. Students should have many experiences in posing and solving problems from their world, from data that are meaningful to them, and from mathematical investigations.

Curriculum Standards(7-12, building upon the K- 6 experiences in grades 7-12):

- Determine, collect, and organize the relevant data needed to solve real-world problems.

- Determine the reasonableness of solutions to real-world problems.

- Use technology whenever appropriate to solve real-world problems which require strategies previously learned.

- Use technology whenever appropriate to solve problems related to basic living skills including, but not limited to, personal finance, wages, banking and credit, home improvement problems, measurement, taxes, business situations, purchasing, and transportation.

- Apply problem-solving strategies to solve problems in the natural and social sciences and in pure mathematics.

Proficiency Standards (End of Grade 10):

- Determine, collect, and organize the relevant data needed to solve real-world problems.

- Choose the appropriate technology needed to solve a real-world problem.

- Translate results of a computation into solutions that fit the real-world problem (for example, when a computation shows that one needs 3.2 gallons of paint to paint a room, how much paint do you buy?).

- Determine if the solution of a real-world problem is reasonable.

- Use technology to solve a problem from science, social science, or mathematics.

Applications are also prevalent in science as illustrated below in the "Unifying Themes and Concepts" strand:

6a. Curriculum Standard: Students will demonstrate an increasing ability to recognize parts of any object or system, and understand how the parts interrelate in the operation of that object or system.

Proficiency Standards (End of Grade Ten [Secondary]):
Students will be able to . . .

- Demonstrate and describe how parts of a system influence each other, including feedback.

- Demonstrate how systems include processes as well as parts (e.g., human body, telephone system, solar system).

- Show how one system can be part of another system, and how systems influence each other.

- Predict how certain changes in the system will or will not affect the operation of the system.

New Hampshire intends to weave standards into all components of the state's educational infrastructure. The plan includes continued and expanded dialogue between K-12 faculty, postsecondary faculty, administrators, admissions officers, and guidance counselors. In addition, the state will . . .

1. identify entry-level competencies for all two- and four-year higher education institutions, allowing individual institutions to determine necessary levels of mastery for admissions consideration.
2. extend curriculum frameworks to include 12 [th] grade proficiencies aligned with postsecondary entry competencies, and assess students on achievement.
3. establish a competency-based admissions system that provides additional basis for two- and four-year admission decisions (initially the system will run simultaneously with the current one).

Strategies for the restructuring of teaching and learning practices include . . .

1. the development of standards that recognize work-based learning experiences as a vehicle through which competencies may be attained.
2. the application of career development framework proficiencies across multiple disciplines and the incorporation of applied skills and work-based learning experiences into existing frameworks and proficiencies.
3. the provision of a framework to translate nontraditional (e.g., interdisciplinary) courses into

disciplinary requirement "language."

4. the development of frameworks for competency-based articulation agreements within five career clusters.

5. the use of more competency-based assessment methods at the postsecondary level to determine advanced standing (New Hampshire State School-to-Work Team, August 7, 1997).

Two problem areas could impact the state's efforts to implement these new standards. First, existing policies such as Carnegie Units that are firmly rooted at the local level may impede rather than advance the state's reform. Second, preservice and inservice professional development standards are needed but currently not available to support the use of authentic learning and teaching strategies by teachers, guidance counselors, and postsecondary faculty.

Vermont's Framework of Standards and Learning Opportunities has aided educators across the state in developing more application-oriented programs for all students. Academic counselors at Champlain Valley Union High School used the standards in their campaign to revitalize the school with school-to-work principles. Like many other states, the thrust of Vermont's standards, adopted by the State Board of Education in 1996, is to improve student learning and provide a stronger assessment system. The Framework is organized around four components: (1) vital-result standards, (2) field of knowledge standards, (3) learning opportunities and examples of recommended practices, and (4) an appendix. Vital-result standards have been developed to cover communication, reasoning and problem solving, personal development, and civic/social responsibility. They cut across and are supported by all field-of-knowledge standards, which include Arts; Language and Literature; History and Social Studies; and Science, Mathematics, and Technology. (See Appendix 7 for a more detailed list of Vermont's Framework of Standards and Learning Opportunities.) The state's comprehensive assessment system emphasizes standardized testing as well as the development of student portfolios in mathematics and writing.

Chart 1
Strategies that Promote Authentic Teaching and Learning: Use Standards and a Supporting Infrastructure

Strategy Being Implemented	Problems/Obstacles Addressed	How Obstacles Are Overcome	Benefits
Minnesota: Basic Standards and High Standards in the Profile of Learning (State Approved, Application-Oriented, Standards-Based Education)	Acceptability-- Freedom from the stigma and perceived threat of vocational education	Development of application-oriented standards endorsed by a broad-based constituency (including higher education)	• Natural fit with STW • Promotes changes in the teaching and testing methods of those exposed to the standards • Less threatening way to approach traditional educators about

			reform
Minnesota: Basic Standards and High Standards in the Profile of Learning	Accountability--Assurance of academic rigor and student performance	Equal importance placed on pedagogic reform and standards at the state level	• Ensures rigor and context in education • Expands academic content while also emphasizing the application of academics • Supported at the top • Provides framework and parameters for acceptable performance
Maryland: Development of content standards for technical courses based on gap analysis with traditional academic courses	Postsecondary Access--Assurance of wide variety of postsecondary options for students	Comparison of skill outcomes between academic and technical (STW) classes by a variety of educators (academic, technical, secondary, and postsecondary)	• Provides for a single, seamless K-16 system that allows students to move through all institutions with minimal problems • Demonstrates and promotes connections between different institutions and their curricula • Allows authentic teaching strategies to function within an existing/tested infrastructure
Maryland: Blended Instruction (integration of academic and occupational education) and	Accountability Acceptability	Maryland School Performance Program (MSPP): process-oriented exams required for graduation of all	• Provides an infrastructure that allows for a wide range of skills to be taught by

Competency/Performance-Based Education		students	regular academic content teachers and integrated into regular classes
North Carolina: Revised application-oriented standards as cornerstone for state assessment; accountability system; and ABCs of Public Education	Accountability Acceptability Postsecondary Access	• Statewide K-12 goals and objectives developed by diverse committee (postsecondary, parents, and industry) • Preliminary competency goals and objectives determined by postsecondary educators	• ABCs make schools accountable for student academic growth *and*workforce preparedness • Involvement of postsecondary and academic educators drives application-based reform • Concerns minimized by involvement
New York: Changes to Regents Exam using applied standards as guideposts	Accountability Acceptability Postsecondary Access	New Regents Exam designed to measure how students apply knowledge and skills and is required for graduation	• Potential to drive curriculum and ensure the proper place for STW in mainstream • Integration into exam becomes a state-level stamp of approval for reform
New Hampshire: K-12 Curriculum Frameworks representing principles of authentic teaching and learning	Accountability Acceptability	New Hampshire Educational Improvement and Assessment Program: Comprehensive state effort to align curriculum, assessment, and instruction	• Provides avenues to increase academic achievement of students and improve teaching methods • State-approved assessments evaluate student knowledge and

			ability to apply knowledge
Vermont: Framework of Standards and Learning Opportunities	Accountability Acceptability	Statewide standards used to provide a stronger assessment system and improved student learning	Statewide interdisciplinary standards are being used to revitalize authentic learning and STW reforms

Allow School-to-Work To Evolve into the Mainstream

. . . the most provocative and powerful impact of K-16 partnerships on higher education is to be found in the implications of two principles underlying most reforms. The first is that our educational system ought to have no barriers between its segments, combining education from cradle to grave into one seamless whole. The second principle is that what counts outside academe is what one knows and can do--and that is precisely what should determine a student's progress through the educational system, including college. (Langenberg, Chancellor of the University System of Maryland, 1997)

Although not fully embraced around the country, authentic learning and teaching methods have fewer obstacles to overcome than a reform such as school-to-work, which promotes the idea of incorporating employer needs and workplace scenarios into classroom activities and academic curriculum. Recognizing the traditional isolation of educators and their hesitation to change, many school-to-work administrators have used the more broad-based pedagogy of authentic teaching to slowly expose teachers, parents, students, and institutions of higher education to the benefits of school-to-work. Indeed, many of the school-to-work programs studied during the course of this project often consider themselves to be "works in progress." They shy away from school-to-work titles and terminology that often promote misperceptions and threaten the reform's acceptance by those who are comfortable with traditional approaches and terms.

Despite the fact that the school-to-work movement was often the impetus for many of these thriving "works in progress" and has supplied needed funding, school administrators and teachers envision their efforts as being driven by broader goals. These broader, authentic teaching and learning goals promote the same strong interdisciplinary and applied learning systems as school-to-work. Unlike quick-fix programs or isolated activities, these more lofty goals consist of reforms to the entire school and, thus, take longer to achieve. The difference between these strategies and others that have been less successful in involving college-bound students in school-to-work is their maintaining, at least initially, some aspects of a traditional framework--one that college admissions officers, students, and parents accept, trust, and understand. These reformers are developing a school-to-work culture slowly, without losing sight of the big picture--a more academically rigorous and applicable education for all students.

Although many of these systems do not meet the exacting standards established under the School-to-Work Opportunities Act for placing students in work-based learning experiences, two

unique features suggest this "school-to-work continuum" offers great hope for expansion. The first is a commitment to developing a strong foundation for authentic learning. Although the authentic learning concepts may be school-to-work ideals, reformers do not necessarily classify their efforts in a narrow school-to-work context. In developing their philosophy, educators try to better position their systems and programs by understanding and anticipating the ramifications for the reforms they promote--for example, the potential resistance from outside and inside the school, and how applied and contextual learning will affect students and teachers. The second feature of this more holistic strategy for reform is its emphasis on changes in *learning*, not changes in the *venue* for learning. This allows teachers to spend their time, at least initially, developing their own understandings of context-based learning strategies and minimizes many of the logistical and financial struggles of placing students in extended work-based learning experiences outside the classroom. Although most educators are working toward requiring all students to complete at least one job shadow before graduation, the shadowing experience is often used to ease school staff, parents, and even postsecondary personnel into the concept of using the workplace as a teaching tool.

Develop a Vision, Foundation, or Philosophy That Supports Systemic, Long-Term Change

A staff member at the **Minnesota** Department of Children, Families, and Learning stated that, despite the notoriety the state has received for its school-to-work efforts, they are "nowhere near" actually "having stuff done." He continued to note, however, that "conceptually, we see what makes sense." What makes sense in Minnesota, based upon their standards and their state restructuring efforts, is the development of a new educational environment promoted by authentic teaching and learning strategies and (as discussed previously) strengthened by state-approved applied learning standards. The depth of difficulties the state must endure to achieve gradual change became evident as interviews with local and state administrators highlighted the tendencies for educators to put curriculum and assessment back into their traditional, disciplinary "boxes" if momentum is not sustained.

To avoid the tendencies to "backslide," support and vision for the change process must be both top-down and bottom-up--accepted by at least some members at all levels of the organization. Minnesota has used the efforts of creative individuals and visionaries to support school-to-work reform and promote authentic learning and assessment strategies guided by applied state standards. These individuals have required latitude and time to develop a system that falls outside the traditional disciplinary boxes as well as the training to develop curriculum that can be accountable for meeting accepted and desired standards. The school-to-work coordinator in **New Hampshire's** Moultonborough School District, a rural town that sends approximately 70% of its students to four-year colleges, stated that her superintendent, a school-to-work supporter, does not "make anyone do anything" but rather gives the staff the opportunities to make their own changes. Likewise, the Winnacunnet School District in New Hampshire gives teachers broad parameters and allows them to make specific curriculum changes as they see fit. In this way, even skeptical teachers are more apt to accept reforms since they have some sense of ownership in the change/reform process.

The change process must also be understood and supported by those outside the school such as postsecondary staff, parents, community members, and employers. In **North Carolina**, polls and focus groups were conducted so that the ideas and needs of concerned citizens and parents could be

incorporated into the state's reform. Educators and industry representatives were consulted and special committees were created. Like the majority of individuals interviewed during this project, reformers in North Carolina took great efforts to educate parents, teachers, and postsecondary institutions about what school-to-work really means. This was primarily because the reformers understood their state's reform to be more than just a program with parts that must be put in place. They have been fighting to change the state educational philosophy toward more authentic learning and teaching, a pedagogy that must have a solid foundation.

A gradual process must be dynamic enough to survive the time required for the school's culture and its personnel to adapt to new, uncomfortable conditions. The school-to-work coordinator for **New Hampshire's** Eastern Region stated that "if you are looking for sustained change, you must go through the entire process to get there." She often makes the analogy to steering a ship--it takes a lot of components and they all must work together. This type of coordination does not come overnight. It is an activity that appears to lack tangible results initially but is, nevertheless, vital if reform is to succeed.

Two years ago, faculty and the school board at the Red Wing School District in **Minnesota**, a school district that sends 60% of its students to four-year college, began debating the benefits of a system structured around traditional Carnegie Unit requirements for graduation. After much discussion, the school board directed the high school to revamp the basis for graduation to include three components:

1. *Minnesota's Graduation Standards.* The state's ten learning outcomes are to become the basis for graduation. Students will eventually have to demonstrate these standards.

2. *A career component.* Each student must evaluate their career interests and choose a career area.

3. *Individualized learning plans.*

A faculty committee developed and implemented a framework entitled "Career and Academic Plan" or CAP. Under CAP, students begin developing their academic and career course of study in the 9th grade. Each year students review their plan with an advisor, a plan that must center on the Minnesota standards.[14] The advisor system requires students to review their CAP every other week with a faculty member that they selected at the end of the 8th grade. Staff feel that the advisor system is "infusing the counseling role into the classroom" by promoting the idea that the "best counselor is a teacher."[15] Teachers are practicing the same type of student-centered pedagogy supported by authentic learning while bringing in the career focus most commonly associated with school-to-work.

Career standards are incorporated into 9th grade civics, a requirement for all students. In civics, students complete an interest survey and perform computer searches for colleges and careers. The results of the activities in civics class become part of the student's career and academic plan, a plan that is reviewed and revised as needed. In the 10th grade, students formally review the plans they devised in the 9th grade.

Red Wing offers courses in four career areas or "pathways": (1) business, (2) natural science, (3) humanities, and (4) technology and industry. The CAP model has four major priorities:

1. Getting workplaces into the school
2. Getting students into the community through internships and job shadows
3. Getting the community involved with new standards
4. Getting teachers into the workplace so they will understand the needs of today's workers

These are clearly priorities of a classic school-to-work model. Unlike other programs, however, Red Wing has developed a supporting infrastructure that is based upon broader, more multidimensional authentic learning goals. These goals, with the support of state standards, have strengthened the school-to-work efforts throughout the district.

Representatives at the Department of Education in **Maryland** admit that their state has been criticized for "not sticking with any one thing long enough to have it take hold." Those involved with the state's blended instruction and "career connections" efforts, however, appear to be "in this (reform) for the long haul." The state has incorporated school-to-work into its overall education reform agenda, which advances performance-based education and real-world contexts--authentic teaching and learning strategies. State education leaders note that Maryland is not *adding* a career component but rather using the career component already in the system to enhance instruction. In this case, school-to-work creates the venue to anchor instruction and improve authentic pedagogy. The state has a strong K-16 leadership council comprised of state superintendents of schools, Maryland Higher Education Commission (coordinating body), Chancellor of University of Maryland system, and Maryland partnership in teaching and learning. Private colleges are not yet as involved as the public institutions.

The Winnacunnet School District in **New Hampshire**, a district that sends approximately 60% of its students to four-year college, is shifting away from the "learning for learning sake" philosophy and toward a career-based curriculum. Although the district's high school is proud of its high standards, the focus is not on sending students to college but giving them the ability to make informed choices regarding college and career. The program centers around the idea that students need to know the available options yet often have very limited information. In addition, many of the school's staff members follow the philosophy of the school-to-work consultant: "It isn't what you know, it is what you can do with it." Only after being given adequate information are students asked to identify a possible pursuit after high school. The school now promotes learning in terms that will allow students to gain more focus and make better connections. They have been so successful at phasing in their approach to reform that when students are asked what they think of the changes, they often answer "there are no changes."[16]

Given the school's career focus, it might seem ironic to hear the school-to-work consultant refer to the school's reform as a "Baccalaureate College Prep Experience" for all of its students. Indeed, the school's consultant states, the school "developed school-to-work before they even knew what school-to-work was."[17] The Winnacunnet model attempts to duplicate the characteristics of educational programs that have been developed for the "top 20 to 25%" of students across the country. These students know that they will go to college and know that they will graduate. There are three core components of the Winnacunnet program:

1. The high school curriculum is structured so that *elective courses are minimized.* All students in the 9 [th] and 10 [th] grades take core classes. Only music, art, and foreign language are allowed as

electives. The curriculum is, therefore, comprised of structured, required courses packed into the high school years to "get students ready."

1. The high school *does not focus on students going to college but, rather, on students preparing for occupations*. In so doing, all students are required to take "Introduction to Computers and Careers," a class that offers students the opportunity to develop their keyboarding skills, gain computer literacy, and use computers to explore careers.

1. *All students are required to choose a career cluster at the end of the 10th grade.* Career choices are made only after considerable exposure to the four possible career clusters: (1) arts and communication, (2) business and marketing, (3) health and human services, and (4) technology and engineering.[18] Upon choosing, students will have authentic experiences based on that career cluster and will take two career-related classes each year in 11th and 12th grades. In choosing a career cluster, each student will get the same diploma but will develop a strand to meet their needs.

The school's school-to-work coordinator states that reform cannot be replicated; it is a battle that has to be fought by each individual school. Those in the school are coming to realize that school-to-work is about "changing the system of education in the community." He stated that you don't change the system by adding a program or an activity, the only way to create sustainability in the long term is to decide to change the whole school.

The Director of Instructional Services in **North Carolina** referred to the state's vision of school-to-work as "cream of mushroom soup"--you "can't pick out the pieces because it is all blended together." North Carolina has been able to create a unified system with strategies such as (1) bringing the dozens of school improvement initiatives into one coherent plan and gathering all of the state's resources behind it, (2) incorporating programs that better prepare high school graduates for higher education and the world of work, and (3) building public awareness and support for the changes this plan will bring to schools across North Carolina. This educational reform has been an incremental process; speed is not the most important priority for the state. Rather, North Carolina wants to ensure that its students can use and apply knowledge at high-performance levels.

North Carolina is integrating school-to-work into the mainstream in two ways. First, statewide curriculum is being designed to incorporate theory and application so that authentic learning and teaching strategies will be promoted statewide. Many state leaders feel that application and theory are not achieved by setting up new courses but, rather, by revising existing ones. Second, the state is working towards a requirement that all students participate in a work-based learning experience. Unlike other states that have a narrow definition of work-based learning, North Carolina offers schools a "menu" of choices regarding the type of work-based learning experience they can offer--shadows, internships, school-based enterprises, and apprenticeships. Schools will not be forced to offer services that they are not ready to provide but can, instead, gain exposure to an application-oriented curriculum and the work-based learning concept at their own speed.

The Commission on Workforce Preparedness created Job Ready, one of North Carolina's school-to-work initiatives, as a systematic process that starts in kindergarten and continues through postsecondary education. This is consistent with the state's gradual movement of school-to-work ideas into the mainstream. Challenging the concept that career education should wait until high school, North Carolina advocates the idea that middle school students should have the opportunity to begin

exploring careers and the world of work. Exploratory programs of this type are now in place in all middle schools in the state. Students choose to take up to two of the following five courses per year in 7 th and 8 th grades: (1) Exploring Career Decisions, (2) Exploring Business and Marketing, (3) Exploring Life Skills, (4) Exploring Biotechnology (agriculture, heath, sciences), and (5) Exploring Technology Systems. The state's Director of Instructional Services found little resistance to the program that now serves about 80% of the students in the state. She says that she uses "student demand as a proxy for acceptance."

Emphasize What Happens, Not Where It Happens

Much has been written about the need for school-to-work programs to "go to scale" if they are to infiltrate into the mainstream. Phrases such as "systemic change" often emphasize the number of students involved in reform more than the quality or components of the reform. Ironically, one of the primary obstacles confronting any attempt to move school-to-work out of its traditional "vocational" stereotype and into the college-bound population is program capacity. Programs that attempt to "go to scale" too quickly--before the school, its culture, its staff, and its resources are ready to handle the extra burdens and obligations of a school-to-work initiative--run the risk of sending students into low-quality work placements where little, if any, learning takes place. And, programs that require "full blown" workplace experiences can discourage the involvement of students and parents who are "on the fence" about school-to-work and prefer to maintain some sort of balance between traditional and nontraditional learning opportunities.

Many reformers appear to have achieved a balance between in-school and out-of-school activities by working to create a flexible school-to-work system that is capable of meeting the needs of all students. Coordinators, teachers, and administrators consider all students as having "college-bound" potential and are more concerned that students receive the benefits of high-quality applied or authentic learning experience than obtain a job and some workplace exposure. They understand that the process involves more than simply offering students a job but working to change the fundamental characteristics of the educational experience.

Highly selective programs like the New Visions program in **New York** offer an intensive workplace experience for only a small number of students. Instead of the capacity of individual programs increasing, administrators hope that the success of existing programs will spur the creation of new programs with a similar philosophy and structure. The positive learning experiences that students and employers share epitomizes the authentic learning philosophy and ensures program continuance. Students are given ample attention and instruction opportunities; employers are not overburdened by a demanding system; and teachers have adequate time to create quality authentic learning plans for students.

New Hampshire's Moultonborough School District is situated in a community that has been criticized for "over-encouraging college." The school-to-work coordinator noted that "we do things that someone else might call school-to-work, but it is just what we do." School-to-work and authentic, applied learning activities are infused into the classroom but do not necessarily end up on student transcripts. The district has used school-to-work money to develop applied learning activities, but as the school-to-work coordinator pointed out, "when school-to-work money is gone, these programs will

still continue." School-to-work funds are being used by a 9 [th] grade social studies teacher who is integrating tourism (one of the primary industries supporting the local economy) into the regular course curriculum and allowing students to visit hotels and design travel itineraries. In addition, a physics teacher offers his students the opportunity to spend three days in a local engineering firm. A language teacher finds translation jobs for her students through connections with the Spanish and French Consulate. These workplace programs were all developed for the primary purpose of strengthening academic achievement.

On the surface, Kingswood Regional High School in **New Hampshire** is structured in a traditional fashion. Students have four paths: (1) college (based on a 4.0 scale), (2) standard (3.5 scale--goal is high school graduation), (3) Tech Prep (3.5 scale--goal is trade preparation),and (4) honors--(4.5 scale--goal is college, advanced standing). To avoid changing the school's curriculum immediately, the school's goal is to have 100% of its students go through an internship or job shadow experience during their high school years. So far over 200 students of the school's 800 have participated in some sort of out-of-school (or school-to-work) experience, even though only 41 students are formally enrolled in the school-to-work program.

Champlain Valley Union (CVU) High School in Hinesburg, **Vermont**, has managed to involve all seniors in an authentic learning or school-to-work experience called "Graduation Challenge" in which students spend 30 hours in an outside (often work-based) learning activity of their choosing. Although the out-of-school experience has now become a high school graduation requirement, its guiding principles are academic in nature. By participating, all graduates attain the skills necessary to investigate/research a subject, apply their findings and the knowledge they gathered, and speak and write about their experiences in a formal setting. The students' out-of-school learning experiences are integrated into academic classrooms through senior research projects/papers written with the assistance of faculty advisors. Each student is required to make a formal presentation of his or her work experience to a panel of judges at the end of the year.

Graduation Challenge began in 1993 as a small pilot program. The program has grown to include all high school seniors, who now receive half credit towards graduation for their participation. The primary reason for initiating Graduation Challenge was to make a fundamental educational change throughout the school. The push for reform came from school leaders, particularly the principal and guidance counselors, who felt that necessary changes were not taking place in the classroom. School leaders chose to focus on three specific areas of reform:

1. Creating a senior exit requirement that would allow students to demonstrate what they are capable of doing
2. Supporting a better transition for 9 [th] graders to upper grade levels
3. Ensuring that at least one adult in the school is familiar with each student (this led to a new schoolwide advisory system in which each student meets with a faculty member of their choosing for 15 minutes per day to discuss their courses and school experiences)

Three members of the IEE research team visited CVU and participated in the panels that judged the Graduation Challenge student presentations. No student is exempt from any of the three components of this exercise--(1) work-based experience, (2) paper, or (3) presentation. Students are required to find their own mentor or "community consultant" as well as their own faculty advisor, who

ensures that they have completed their hours outside the school and guides them through their research paper. Faculty members who are not personally involved with the students grade the ten-page research papers. The panels that evaluate student presentations are comprised of faculty members, community consultants, parents, and various community members. Student presentations are evaluated on their content, organization, and delivery. (See Appendix 8 for a listing of the assessment criteria for student presentations.) The program appears to be a tremendous success as evidenced by the energy and enthusiasm that faculty, community representatives, and even low academically achieving students displayed. Academic faculty members are starting to support the program. Students are gaining exposure to the workplace, and representatives from the workplace are developing new relationships with the school.

Topics for the 1998 Graduation Challenge projects covered a wide range of industries and concerns. One student designed and conducted a survey about the local community's understanding of and attitudes towards solar energy. The project also included a job shadow with a company that designs and builds solar-powered cars. During the student's Graduation Challenge presentation, he demonstrated his knowledge of statistics by discussing the results of his survey as well as his understanding of science by discussing the solar car's system. During her presentation, one student explained how she had decided against pursuing a degree in broadcast journalism. The student, after witnessing the capture of a fugitive during her internship at a local television station, realized the job of uncovering breaking stories had too much pressure. A third student spent thirty hours working in a car stereo store. During his presentation, he confirmed his plans to attend trade school in this area as well as discussing the opportunity to participate in a statewide competition of car sound systems. The important thing to note about Graduation Challenge is that only a small number of the students involved are formally considered to be school-to-work students, yet all were given the opportunity to participate in a quality school-to-work experience.

Although attempting to do something similar, Indiana County in **Pennsylvania** is not experiencing the same success implementing its career exploration requirement, "Graduation Project." In 1999, all graduating seniors in Indiana County must complete this project, which is intended to provide students with an in-depth look into a specific career. Ideally, all students will have an opportunity to job shadow as part of the process. The county's school-to-work coordinators, however, have stated that, lacking uniformity between schools, the project has turned into a research paper on a career, rather than an
in-depth career exploration.

Chart 2.
Strategies That Promote Authentic Teaching and Learning, Allowing School-to-Work To Evolve

Strategy Being Implemented	Problems/Obstacles Addressed	How Obstacles Are Overcome	Benefits
Minnesota: State development and promotion of pedagogical concepts to support applied standards and assessment	Acceptability Accountability Postsecondary Access	• Top-down and bottom-up support for deep reforms • Cognizance that all levels must	• Allocation of time and latitude to create a viable, sustainable system

		work together	
Minnesota: Red Wing School District's Career and Academic Plan (CAP)	Acceptability Accountability	• Framework developed by faculty committee to include individualized student support, graduation standards, and career component • Support for changing infrastructure based upon authentic learning and standards	• Approach emphasizes a student-centered pedagogy to minimize resistance • All faculty is fully infused in the school's changes (i.e., involved with developing programs and counseling students) • All students become involved early (9 th grade civics class, determining career and academic course of study)
North Carolina: Wide spectrum involvement in reform at all phases of development	Acceptability	State-initiated polls and focus groups with industry, community, and educators at all levels and areas of expertise	• Full knowledge of needs of constituency groups prior to initiation and development of the reform system • Forum to discuss and understand the potential for resistance
North Carolina: Unified System of Strategies incorporating theory and application	Accountability Acceptability Postsecondary Access	• One coherent plan bringing together various initiatives that prepare students for higher education and work • Public awareness	• Limited duplication of effort statewide • United vision • Schools can work at their own speed to provide quality services for

		campaign to inform and promote changes • Job Ready process providing career education for students from kindergarten through postsecondary	students • Incremental process ensures all students perform at high levels and gain work-based learning experience
New Hampshire: Winnacunnet School District reform emphasizes giving students the ability to make informed decisions about their future (college and careers)	Acceptability Postsecondary Access	• Assumes all students attend college • Highly structured curriculum allows students opportunities to take electives without sacrifices • Career choices are made only after considerable information is gained by students	• Reform for the entire school • Limited threat to parents • Gradual changes not detected by students • Same diploma for all students with varying electives
New Hampshire: Moultonborough School District • Teacher latitude to develop curriculum • Teachers create school-to-work curriculum but don't necessarily refer to it as such	Acceptability	• Staff opportunities to implement change as they see fit • No forced reforms • Applied learning is infused into classroom activities but doesn't necessarily appear on transcripts	• Ownership of reforms • Fuller understanding of concepts leading to/supporting reforms • Reforms that meet local needs • More potential for long-lasting effects (even after funding is gone) • System can be phased in to ensure minimal disruptions to students, parents,

			and so on
			• Workplace programs are primarily for strengthening academic achievement
New Hampshire: Kingswood Regional High School	Acceptability	Goal to have 100% participation in job experience but less interested in formal enrollment	• Students can gain workplace experience without any threats to traditional education pathway • Slow movement to acceptance with limited immediate opposition
Maryland: Overall reform agenda of performance-based education and real-world contexts	Acceptability	• Blended Instruction and Career Connections which use the real world to enhance instruction • K-16 leadership counsel	• STW creates venue to anchor instruction and improve authentic pedagogy • Not adding career component to enhance instruction
New York: New Visions Program	Acceptability	• Small selective programs with intensive work experiences • Intent is to grow as new programs are created, not to increase class size (individual attention is important aspect of program)	• Students receive ample attention and instruction opportunities from employers • Employers are not overburdened by a demanding system • Teachers have adequate time to create quality authentic learning

			plans
Vermont: Champlain Valley Union High School Graduation Challenge	Acceptability	• All students required to participate in outside learning activity before graduation • Outside experience is integrated into academic curriculum • Involvement of academic faculty	• Gradual reform of the entire school by involving all students, parents, and teachers • Avoids the stereotype associated with involvement in vocational education • Activity that affects the entire school, unifies the school

BUILDING PEDAGOGICALLY STRONG EXPERIENCES
OUTSIDE THE CLASSROOM

By definition, school-to-work programs are comprised of a career- or work-based component. Unfortunately, the idea of sending students to the workplace conjures up all sorts of negative images of stereotypical vocational programs that exist primarily to occupy the time of students that no one else wants. Consequently, programs around the country have suffered because teachers and parents refuse to take the chance that their student/child's educational experience will be comprised of spending time in a company's back room filing documents or at a reception desk answering phones. Since the integration of the work into the school day may incite fear and anxiety in many educators and parents, school-to-work proponents must exercise caution when discussing and advocating guided outside experiences as a part of school-to-work reform.

Successful programs find innovative ways to promote and develop guided work experiences and not to evoke the fear of the workplace that often disconnects college-bound students from school-to-work programs. First, many programs seek to communicate more effectively about guided workplace learning experiences, usually without using the traditional vocational education jargon. Second, they concentrate their energies initially on constituency groups that are more receptive to work-based contact. Science and business disciplines, for example, have long traditions of work-based, application-oriented education, especially in higher education. In addition, academic educators,

although often skeptical of business interference in education, find business exposure less threatening when it is part of a professional development experience. Third, several successful programs emphasize one benefit of guided work experience that is neither a threat nor an obstacle to future success in college and career: the simulation of college and adult experiences. Many school-to-work programs appear guarded when they report the guided work experiences of their students to higher educational institutions. Successful programs do not assume that institutions of higher education, students, or parents embrace or even consider alternative student records. Instead, they work slowly with these individuals and institutions so they can grow to understand and respect the advantages of guided work experiences.

Emphasize Effective Communication: Shy Away from School-to-Work Jargon

During telephone interviews, the majority of the school-to-work coordinators indicated one dilemma in instituting guided work experiences in a diverse student population--communicating such activities to parents, teachers, students, and postsecondary institutions in a language and format that they understood and welcomed. While many school-to-work coordinators stated that they had reason to believe that guided work experiences take place in postsecondary institutions and in professional training, they also stated that they encounter one of two responses when they begin a dialogue about school-to-work reform. College admissions officers, faculty members, students, and parents either demonstrate a lack of knowledge of school-to-work or they appear aware of the reform but refuse to use school-to-work jargon or vocational terms when discussing any of the programs in which they are involved.

Postsecondary institutions, students, and parents often ask "What exactly *is* the school-to-work experience?" and "What are you trying to do?" Postsecondary institutions seem concerned about any extra burdens that the reform may entail by asking "What exactly is it that you want *us* to do?" Once vocational education-type jargon is used to propose education reforms, those involved in postsecondary education often seem disinterested in continuing the conversation.

University of **Maryland** faculty, in attempting to determine the gaps between the system's applied curriculum and traditional courses, discovered that the language used by those working on applied academics is not only uncommon to academic college faculty members but reminded them too much of vocational education. Despite the fact that many of the guided work experiences associated with the applied curriculum were successful in teaching students the same academic skills and knowledge found in traditional courses, academic faculty found that the development of applied academic courses lacked the pedagogical theory to which they were accustomed. Once four-year college, community college, and secondary school faculty began speaking the same language and recognizing the consistencies among course material and focus, conversions between applied and traditional curricula took place quickly.

The Director of the Rochester Institute of Technology (RIT) Cooperative Education and Career Services Department in **New York** stated that "colleges are doing school-to-work, they just are

not calling it that." Indeed, he and many others interviewed during this project noted that semantics is a big problem in moving the school-to-work reform platform forward in postsecondary institutions. Higher education faculty and staff often interpret work-related education as being of a lower level with less prestige and academic rigor. One regional school-to-work liaison in New York admitted that New York has spent too much time trying to "retro fit" school-to-work jargon into its activities, stay on top of the "reform word of the day," and use the proper "systemic jargon" in reports and conversations. This undue concern with how reform activities are verbalized cripples the ability of reformers to understand the real meaning behind the reform and communicate with other constituencies. To remedy this situation, New York State is putting together focus groups that will be given an opportunity to put the mission statement into their own words and, from this, more effectively communicate with other groups.

The Academic Planning, Policy and Evaluation Group of the State University of New York System, like many other state university systems, conducted a mail survey of its institutions in August of 1997. The survey was divided into five parts: (1) communication and collaboration with K-12 institutions, (2) curriculum development and instruction, (3) teacher preparation, (4) admissions, and (5) connection to the local economy. It was mailed to academic vice presidents, deans of enrollment, and directors of schools of education or teacher preparation programs.

Several of the report's findings suggest that postsecondary institutions take part in school-to-work activities but do not directly associate them with the school-to-work movement.[19] When asked to characterize their institution's curriculum development over the last ten years, 52% of the four-year schools indicated "in the classroom, an increased emphasis on the application of knowledge to non-academic settings." Sixty percent of the institutions indicated "increased emphasis on `hands-on' instruction" and 88% indicated "integration of courses across separate disciplines." Ninety-two percent of the universities indicated "increased use of learning experiences outside the classroom (e.g., internships, field trips) as integral components of courses and majors."

Yet four-year institutions also state that a high school student's work-based learning or employment experience has "little influence in the admissions decisions." Since 92% of the four-year institutions surveyed indicated they communicate their expectations through "one-to-one interactions with high school staff," communication is clearly ineffective. The three most frequently reported ways of communication regarding changes in K-12 curriculum and instructional methods were "informal contact with K-12 educators" (84%), "general media" (92%), and "updates and newsletters from the State Department of Education" (88%). Only 32% of the four-year institutions indicated coordinating activities with any school-to-work partnership; but 97% of the two-year colleges indicated activities with school-to-work partnerships (State University of New York System Administration, 1998).

Shrinking college acceptance rates induced counselors at Champlain Valley Union High School in **Vermont** to visit the admissions offices at three selective colleges (Bates, Colby, and Middlebury Universities) that have traditionally been attended by many of their students. All three schools indicated that they have become more selective and base their assessments almost entirely on standardized test scores, classroom grades, and weighted class rank. All three were skeptical of "alternative programs" such as Graduation Challenge, saying that they would "almost discard it" when

reviewing a student's transcript, given the difficulty of evaluating the quality of learning in such outside educational experiences. One school suggested that alternative programs be attempted only in conjunction with advanced courses.

Two schools, however, indicated a subtle movement toward acceptance of more application-oriented measures--one stated that student interviews were a "critical component of the admissions process"; another spent more time analyzing student essays. All of the schools emphasized the need for consistency in student records--if AP courses are offered, all advanced courses need to be listed as AP, not "honors." In addition, colleges must be informed of the difficulty level of new courses. Secondary educators in Vermont have begun a dialogue with postsecondary institutions that may eventually lead to the acceptance and respect for outside learning activities among Vermont's selective liberal arts colleges.

Work with Receptive Constituencies and Situations

Many of the directors and coordinators interviewed during this project mentioned a "liberal arts wall" that school-to-work reformers face. Many liberal arts institutions refuse to acknowledge the use of activities outside the classroom and question the benefits of experience-based learning in higher levels of academic training. This is not to say that all educators in the postsecondary community lack an interest in understanding and refining many of the application-based philosophies and pedagogical strategies that school-to-work promotes. Many school-to-work leaders have found it in their best interest to nurture the enthusiasm of those who appear more receptive to educational experiences outside the classroom rather than to fight to be understood by those who wish to hold on to traditional ideas.

Four of the states investigated for this project are involved in an effort directed by the Educational Commission of the States (ECS) to connect learning and work in postsecondary education.[20] The ECS project, as one participant described it, is an initiative that came out of an interest in how work and learning are being integrated beyond school-to-work and Tech Prep forums--"outside the traditional school-to-work notion." The six states involved in the program, each approaching the issue of work and academic integration in a different way, are Colorado, Minnesota, New Jersey, New York, Oklahoma, and Wisconsin.

New York State's project is designed to encourage institutions of higher education--both public and private--to develop strategies by which their students may self-consciously better prepare to meet the demands of both work and life beyond their formal education. All four participating institutions[21] intend to use this project to "enable students to draw informed, meaningful connections between learning, work, and life choices" presuming "the importance of academic advising and career counseling." Each school, after signing a written commitment to the program, is working to develop school-based reform that is concentrated around three strategies: (1) curricular/course interventions, (2) experiential learning models, and (3) assessment initiatives. Individual projects will be integrated into a model that can be used as a tool by other institutions to identify and assess school-to-work and applied learning outcomes.

The**Oklahoma** ECS project has brought together the state governing board, Oklahoma Board of Regents, University of Oklahoma, and National Geographic Society to determine the activities that will get students interested and better prepared for careers in geography. Project participants are connecting high school teachers with high school students on a postsecondary track who have voiced an interest in careers in geography. Students and teachers are then linked with postsecondary history and geography programs around the state to create a curriculum that will integrate school-to-work ideas at the higher education level.

Many of those involved in school-to-work activities in the University of **Maryland** System state that much of the success in implementing reforms at the university comes from the top-down support of faculty and administrators who are not only receptive but committed to change. Chancellor Donald N. Langenberg is involved in school-to-work at the local level by chairing the higher education linkages committee at the University of Maryland Baltimore County. In a unique show of support for more application-oriented activities, the university officially sponsors research grants that promote integration at the postsecondary level.

Two engineering schools in the University of **Maryland** System, Baltimore County and Eastern Shore, have used school-to-work funds to create more application-oriented programs for their students. One program is designing a senior capstone mechanical engineering course that is focused on the actual design and manufacture of a product in an industrial setting. The other program has proposed a faculty externship program to "investigate the applications of computer graphics and solid modeling in an industrial setting." Faculty visits to architectural and manufacturing firms as well as a series of workshops will be used to plan and implement an Advanced Computer Aided Design course that will cover computer graphics, geometric modeling and solid modeling, a course required for all Construction Management, Engineering Technology, and Technology Education majors (mdk16.usmd.edu/grant.html).

Aided by the same special faculty mini-grants that are being used by Baltimore County and Eastern Shore,[22] content area academic faculty in the Department of Medical and Research Technology at the University of Maryland's School of Medicine have been encouraged to integrate work-based learning into their curriculum and develop interdisciplinary pedagogy. The school has recently implemented a baccalaureate-level biomedical research track designed to respond to employer-defined skill standards, integrating classroom simulations and structured externships into its curriculum.[23] The chair of the Department of Medical and Research Technology stated that, "although higher education does not advocate involving industry, we feel it is important to look at industry needs." The "progressive" curriculum follows accrediting guidelines and teaches the skills that are required in certifying exams published by key trade associations. In addition to technical skills, students learn interpersonal skills such as the ability to handle change and adapt. The program's course in "applications in biotechnology" requires students to work three days a week or perform research in a lab. At the end of students' senior year, they work full time in industry for three months. [24] This year, papers from four seniors in the program were accepted for presentations at the national meetings of the American Association of Chemical Engineers and American Society of Microbiology. The program has been so successful that the School of Medicine is making plans to expand the approach into the curriculum of other health careers and allied health care.

The chair of the department states that the administration is behind the program. The dean of

the School of Medicine has proven to be a supportive "visionary" who wants to build a "hybrid" department--one that maintains an applied and developmental research focus. In pursuing this reform, the chair has found, to her surprise, that the "hierarchy is more receptive than the grassroots faculty." She notes that the deans and administrators have realized that they can meet the needs of employers and students who are both their clients by concentrating on equipping students with the skills and knowledge to be productive/successful in the work world.

The director of Cooperative Education and Career Services at Rochester Institute of Technology (RIT) in **New York** believes that one of the major differences between engineering and other disciplines in higher education is that engineering has always worked under a school-to-work paradigm that supports the use of guided experiences outside the classroom. He points to the co-ops, internships, and exploration programs offered at countless universities around the country. Indeed, premier engineering schools such as those at Northeastern, Drexel, and the University of Cincinnati have strong traditions of practical application where students are required to prove that they can function well outside the classroom.[25] RIT, an institution with a long history of experiential education, is changing its instructional strategy by eliminating large classes/lectures and implementing more hands-on labs. Having the largest mandatory cooperative education program in the state, RIT attracts students with a definite career outcome in mind, usually students with a lot of work-based learning experiences.

Not surprisingly, RIT is part of New York State's ECS project to connect work and learning. The institute is creating an assessment model that uses the learning outcomes and accreditation criteria developed by the Accreditation Board for Engineering and Technology (ABET). The project's director finds the ABET learning outcomes have implications for both inside and outside the classroom. Students must be able to function in multidisciplinary teams, communicate effectively, design and conduct experiments, and analyze and interpret data.

The New Visions programs in **New York** State have been more successful in health care occupations than in other areas such as criminal justice, communications, and manufacturing. Perhaps the reason for the success of health care programs stems from the wide range of career opportunities that the field offers. Indeed, the three credit elective course in "health care awareness" includes anatomy and physiology, microbiology, and applied chemistry and physics--each offers educational and occupational opportunities outside and inside the health care setting. Similarly, health care is more accustomed to integrated learning--professional preparation in medicine centers around a school-to-work experience the profession has labeled internship and residency. A New Visions program in environmental science is scheduled to begin in the fall of 1999, and a biological sciences program at Cornell University is being developed.

One**North Carolina** Department of Education staff member referred to science professors at the University of North Carolina as "the ones who carried the water" in the state's attempt to get applied classes and integrated curriculum accepted as four-year college prerequisites. Taking approximately six months of negotiation with the University of North Carolina to accomplish this "major coup," science was one discipline that was willing to accept a sequence of applied courses-- Principles of Technology I and II--for college credit. Principles of Technology will now be accepted as one laboratory credit (applied physics), one of three science credits required for University acceptance: one lab, one physical science, and one life science.

Realizing that many of today's workers are generalists who need to adapt to a myriad of situations and circumstances, faculty at Babson College in **Massachusetts** began developing a new interdisciplinary focus for their undergraduate business curriculum that utilizes integrated courses, customized learning tools, and field-based learning opportunities. Babson, a small college of approximately 3,200 undergraduate and graduate students, has had its undergraduate business school ranked number one by *U.S. News and World Reports* since 1989. The innovative undergraduate curriculum is based on the college's MBA program that was recently revised to offer students practical and fieldwork experiences that integrate the academic disciplines and support individual learning needs. The curriculum will now include ethics and social responsibility; international and multicultural perspectives; leadership, teamwork, and creativity; numeracy; and rhetoric.

Student progress is based upon the achievement of 27 core competencies, mastered at three developmental levels: (1) foundation, (2) intermediate, and (3) advanced. Throughout the levels, the curriculum emphasizes learning by doing and gives students some autonomy over their education. The foundation level requires students, in small learning teams with the help of a faculty mentor/advisor, to formulate, in writing, a plan of how to master the competencies. The students also take an integrated humanities and quantitative methods course; take part in a yearlong Foundation Management Experience (FME) to design and manage a business; and obtain feedback on the development of their competencies from local business members, alumni, and MBA students. At the intermediate level, students take integrated liberal arts classes and are required to register for a three-semester sequence that centers around critical thinking. The advanced level requires students to complete a "learning plan" that was developed during the intermediate level. More than a major, the "learning plan" is a self-directed course of study based on the students' career goals and the further development of core competencies. The plan stresses field-based study, academic coursework, and purposeful thought about educational goals and processes.

At the secondary level, Academies of Finance programs around the country now enroll over 7,000 students in 114 high schools in 26 states. Created by the National Academy Foundation in 1982, the Academy of Finance is an elective two- to four-year program. Academy programs, which supplement a standard high school curriculum, pursue three educational goals:

1. The integration of classroom instruction with workplace experience
2. The attainment of understanding and practical skills that will allow students to start careers and make informative choices concerning the financial services industry
3. The orientation of students to the college experience by providing them with the opportunity to earn college credit

Academy of Finance students take courses in the general high school curriculum as well as two to three specialized courses each term designed by the National Academy Foundation and leading educators and industry representatives.[26] In addition to these courses, students must take two years of mathematics and one year of accounting, and are strongly encouraged to take a foreign language. The National Academy Foundation reports that more than 90% of its students pursue a postsecondary degree at either a two-year or four-year college (Academy of Finance brochure, n.d.). In the New York City Academy of Finance, which consists of 11 high schools, there were 343 graduates in the class of 1998. Of these, 328 were accepted to postsecondary institutions--309 to four-year colleges and 19 to community colleges. The remaining students entered full-time employment, the armed forces, or were

undecided about their future at the time they were surveyed.

Use Professional Development Activities To Create Partnerships

In order for school-to-work to overcome the opposition of its skeptics, learning experiences offered outside the traditional classroom must be high-quality. These experiences must function as more than job placements and, therefore, require more and better professional development for employers and educators than has traditionally been expected or needed. Many reform efforts are using training to advance partnerships between constituencies that have had limited contact. Training offers secondary educators the opportunity to forge new relationships and work toward common goals with industry and higher education. As educators and industry representatives work together, a sense of cohesion and mutual respect forms; misperceptions are weakened if not eliminated. Postsecondary faculty/administrators, academic teachers, and industry leaders who are not "sold" on the benefits of school-to-work can take part in the development of applied learning instruments and have the opportunity to see for themselves what students gain from guided learning experiences that take place outside of school. Perhaps the most important part of the process is the time that professional development allows for unhampered communication. Skeptics are allowed to take part in applied learning experiences that are similar to the guided learning activities of students. Employers often become intricately involved in professional development activities by hosting educators in their workplaces. They learn to appreciate the intricacies of curriculum development and gain a new respect for educators.

Program coordinators (teachers) in **New York's** New Visions program in the health occupations are given opportunities to develop professional, working relationships with three different peer groups as part of their yearly professional development activities. During the year, coordinators must consult with academic teachers at various home schools for reviews of applied curriculum and other classroom materials. Consultations include one meeting per month, visits one or two times a year, and sporadic telephone calls. This connection, more than just a one-time exchange of ideas, has had a positive effect on the classrooms in at least two home schools we investigated. Not only are the academic consultants less skeptical about the academic rigor of the courses in these "vocational" programs, they are beginning to try some of the approaches in their own classes. New Visions coordinators then spend the last week of school with other New Visions coordinators to share ideas and curriculum. The coordinators also attend the annual conference of the New York State Health Educators Association as part of their professional development. By connecting with educators at all levels, outside and inside the secondary arena, coordinators are given an opportunity to increase the level of rigor and sophistication that their programs provide while promoting the school-to-work principles.

Approximately 1,000 teachers in **Maryland** have completed the first phase, or strand 1[27], of the state's efforts to train educators in blended instruction. The state's professional development process is not only used as a way of "getting the word out" to teachers in the classrooms but of sharing knowledge about school-to-career reform with various constituencies who question the validity of outside learning experiences. One of the benchmarks of the blended-instruction strategy is to use professional development as a way to expose university personnel to the integration process. In

addition, the state brings "great teachers into the university system to show the faculty how teaching has been transformed."[28]

To participate in the blended-instruction workshops, local schools must apply as a "team." The teams must include one academic/content area representative, a career/tech education person, at least one member from the postsecondary community, and an industry partner. Interest from the University of Maryland System has been strong; 50 faculty members attended one of the state's workshops in an effort to, as one state official put it, "raise the academic rigor of the projects." Not applying as a team, faculty members were assigned to various workshops. A University of Maryland faculty member commented that the blended instruction workshops were an "eye opener" for the faculty. Not only could they see the connections and pathways, they began to understand what the state grants for integration were all about. It is no longer necessary to recruit for subsequent workshops; faculty now come on their own.

In addition to offering funding to encourage faculty to develop applied and interdisciplinary curricula, mini-grants offered by the University of Maryland have also become a mechanism for getting faculty members involved with secondary educators who are doing similar work but whose paths do not usually cross. As a precursor to the grant, faculty members must attend an "intersegmental educators conference." The latest conference hosted over 400 secondary and postsecondary educators. One University of Maryland faculty member believes that part of the difficulty some states have in getting postsecondary faculty involved in school-to-work reform is that they simply never ask for their participation. A professional development-type forum provides a friendly, nonthreatening exchange of ideas. After observing high school students participate in labs, construct diets, and analyze food samples in a nutrition science program in Montgomery County, one University of Maryland Nutrition Science professor stated, "I won't be able to teach my lab the way I have always done it."

Towson State University in Maryland requires its preservice teachers to participate in a guided work experience before graduation. During their instruction, teachers in training act as a teacher aide. While internships are not uncommon among teacher training programs, what makes the Towson State program unique is that teachers are given a formal mentor and are required to keep journals and develop a portfolio. In addition, their total program has become less lecture/theory and more on-the-job training. Although individuals involved in this new applications-oriented teacher training are not certain about the results, the program is being evaluated externally to determine its impact on teacher performance.

In**New Hampshire**, school-to-work is considered an "all students, all teachers" reform--not a *program* but a "strategy for educational improvement." A major focus of the strategy is on teacher externships. The State Department of Education, in partnership with the University of New Hampshire, is embarking on its second year of the "Educator at the Workplace" fellowship program. In this summer program, which lasts five weeks, teachers spend one week attending professional seminars at the university and three to four weeks at a work site developing the curriculum project they specified during the application process. Although only 14 to 15 teachers in the state have participated in the program so far, regional coordinators hope that the fellowship will induce school-to-work buy-in at many different levels across the state. Unlike externships in other states where teachers are simply sent to visit and observe a workplace environment, teachers prepare to enter the

workplace and develop specific goals.

Two unique aspects of this fellowship make it particularly likely to succeed. First, the application process requires teachers to think specifically about how they can utilize the workplace in the classroom--to have specific goals *before* entering training and the workplace. The experience is not simply one of workplace observation but use of the workplace as a medium for curriculum development. Second, the fellowship does not end with the individual's training and workplace experience. As part of their fellowship agreement, fellows commit to return to their schools and districts and teach their peers the process they have learned. The fellowship and school-to-work principles already have support from the university, including commitments from the School of Education, the Vice President of Academics, and the Provost.

On the wave of major reforms that are taking place in **Minnesota** through graduation standards, the education departments at Minnesota colleges are considered to be the constituency group "most worried about changes." Although professional development in the state "is not where it needs to be," the state's Board of Teaching Standards is changing to be more consistent with the new graduation standards. In addition, the Department of Education and Minnesota State Colleges and Universities (MnSCU) are focusing their work on a "preK to 14+ world." A summer 1998 education conference for K-12 superintendents will feature a discussion between the President of UMN, Chancellor of MNSCU, and the Commissioner of Education around the theme that "learning and work are synonymous terms."

Wisconsin, one of the six states involved in the ECS project to link work and higher education, is identifying students at the secondary level who may be interested in teaching, involving them with work-based learning experiences, and tracking their progress through higher education. The state is trying to better define teaching and learning philosophies that support outside learning activities and establish accompanying curriculum that will help institutionalize school-to-work principles. Those involved believe that once the principles that support learning outside the classroom are developed and understood, they will move into the classroom.

Simulate the College and Adult Experience

Student acceptance into a postsecondary institution is not sufficient evidence that school-to-work programs actually work. Students must successfully *complete* college before school-to-work reformers can congratulate themselves on providing students with the skills they need to tackle their new academic and personal environments (Cargill, 1994). One of the primary benefits that guided learning experiences outside of the classroom can offer students is an opportunity to function as more independent, mature individuals in a controlled environment with a strong support system of teachers and other concerned adults. Block scheduling, a school restructuring method that is often used in school-to-work programs, is considered essential by several of the coordinators interviewed during this project so that their high schools can become a more college-like environment for students. Offering a guided learning experience to students makes it easier for high schools to emulate the autonomous

environment that college students and adults face. Given guided learning experiences such as the ones described below, students will be spared the culture shock that often comes upon entering the college community and the "real" world.

New Visions coordinators interviewed in **New York** pointed out that participation in the health care program has given several cohorts of students a better opportunity to demonstrate mature, adult behavior than participation in a traditional high school program. After the first five weeks in a traditional classroom environment at the worksite (mornings at their home school; 10 a.m. to 2 p.m. at the hospital), students spend only Monday in their workplace classroom. Tuesday through Friday afternoons they complete academic- and career-oriented assignments that bring together their learning experiences during job rotations throughout the hospital. Teachers are not looking over their shoulders to make sure that students have completed their assignments and projects; students must budget their own time for their weekly assignments. This type of independence from the teacher "bridges the gap between high school and college."

The senior-wide Graduation Challenge project at Champlain Valley Union High School in Hinesburg, **Vermont**, was first conceived as a way for students to learn to conduct themselves in an interview and gain independence and maturity. Rather than being given a topic to investigate, it is up to the student to choose an area of interest and take the initiative to find a work-based learning experience. Students must schedule their own work hours and find their own "community consultant"--an employer or community representative to act as a workplace mentor. Initially, students complained about the being left alone to handle workplace difficulties. After contemplation, however, they felt capable of handling future problems with adults because they were forced to do so in their program. They also seemed grateful that the program forced them to learn to budget their time and prioritize in a way that traditional academic classes did not.

McKeel Academy in Polk County, **Florida**, does not consider itself to be a vocational-oriented school, yet nearly all aspects of its operation emphasize school-to-work concepts. Nearly all of its students, with its first senior class graduating in 1999, have been able to attain above average test scores in the district and the state and are expected to pursue a college education. Students are introduced to career clusters in grades 6 through 8. By the time students reach the 9 [th] grade, they choose between one of five career clusters and take integrated academic courses.[29]

What makes McKeel Academy's reform effort unique is the adult environment that has been simulated for its students--in this case inside the school. Class performance as well as the achievement of employability skills such as arriving to class on time, being prepared, and participating in class exercises enables students to earn McKeel money.[30] Income and social security taxes are deducted from the students' earnings as well as $50 per pay period for savings. Money can also be deducted from student accounts if behavioral problems occur such as running in the hall--which is considered a speeding ticket. Students can earn bonuses for perfect attendance, honor roll, and participation in school-sponsored contests. Students can earn one vacation day, to be spent on a job shadow with a friend or relative, if they have perfect attendance for the semester.

Through this innovative system, students are able to learn how to manage their lives before they must do so in college or the work world. They must maintain their checkbooks as well as handle a variety of budgeting issues discussed in their classes. In addition, the McKeel dollar is a great

motivational tool for high school students who plan to attend college. The school's business partners provide a matching college scholarship fund in a ratio of 1 to 10 for all students. Currently, the largest college scholarship fund has reached $500. Students also participate in the Polk County Business Roundtable and perform real-life projects that are similar to work experiences, part-time jobs, or job shadows.

Make Portfolios and Alternative Assessments More "User Friendly"

Even postsecondary institutions that appear to have embraced experiential learning are often reluctant to abandon traditional admissions measures such as ACT and SAT scores in favor of skills and knowledge learned outside the classroom and reported in portfolios, résumés, references, and essays. RIT's director of Cooperative Education and Career Services states that it is still too early to see the implications for students who use work-based experiences on their college applications. The director cites preliminary studies that indicate that work-based learning "may not mean a whole lot." He still sees most universities looking at traditional measurements such as SATs, GPAs, clubs, and activities. Although he does note that school-to-work may strengthen students' applications, he cautions that these experiences are still in the "other category." He asked himself a hypothetical question to indicate RIT's position on school-to-work experiences: "Would we be willing to take a kid with a 1000 on SAT and 85 high school average with some
co-op experience over a 1300 SAT and 95 average?" His answer: We are "not there yet" but "when it comes down to two very close students, we will take the kid with experience."

Some colleges may be turning around. Four-year institutions in the State University of New York System were asked how a portfolio comprised of student work and comments from teachers and supervising adults would be treated if received in their office. Surprisingly, only 3% indicated they would *not* be considered in admissions decision, 53% indicated a portfolio would "definitely be considered in admission decision," and 43% indicated a portfolio "would be considered only for supplemental information in `borderline' cases."

Indeed, many colleges, as the academic counselors at Champlain Valley Union High School in **Vermont** discovered, do consider portfolios and extracurricular and community service activities but only in borderline cases. Many explain that they do not have the resources to uncover the student competencies embedded in detailed essays and work assignments. Failing to account for a college admissions office's need for brevity, secondary institutions have failed to offer postsecondary institutions the types of information that will allow them to make easy, overt connections between what they consider to be nontraditional student experiences and activities and the traditional high school curriculum. If colleges see connections between school-to-work or school-to-work-type experiences and the courses and skills they understand, they may be less resistant to accepting these experiences and even, over time, grow to value them.

As part of the ECS program to encourage higher education to link work and learning, Syracuse University in **New York** is developing a systemwide assessment program. The program

includes raising awareness about learning outcomes and skills improvement among students and faculty.[31] The university's Chancellor, realizing a need for greater awareness of assessment, was willing to confront the stigma that surrounds student evaluation and testing in higher education and directed this top-down initiative. The project will analyze current assessment activities throughout the university and see how they compare with the kind of outcomes that the university and its departments want to see. Through this exercise and the dialogue that will accompany it, university faculty will learn better assessment techniques and students will learn to articulate and structure their educational experiences so that they can gain the skills they need to succeed.

Given the myriad changes in pedagogy and assessment that promise to stem from the new **Minnesota** Graduation Standards, many educators are confident that a new type of student will be entering the world of higher education--one who enjoys a responsive and dynamic learning environment. These new experiences require a new type of record for documenting student achievement. The state is not expecting postsecondary institutions to adapt to these changes alone or overnight. They have worked to uncover the needs of college admissions personnel and have taken these needs into account in their new dual or two-page transcript. Traditional information such as course, letter grade, class rank, and standardized test scores can be found on one page; a series of bar graphs representing new standards-based information is on the second page. Various standards that the student has attempted, including the title of the performance task, the achievement score (1-4), and whether the activities took place outside or inside the school will be indicated. These bar graphs will show the relative strengths and weaknesses of students and illustrate patterns and evidence in a concise format for college admissions personnel. In effect, these two documents create another view of the student's achievement without sacrificing information or time needed to decipher many new, nontraditional transcripts.

Minnesota officials are aware of the importance of "positioning" the new transcripts. Parents must be educated so that they are not "scared off" by the new information and format of the transcripts. At the same time that new information is being presented it must have some semblance of familiarity so that postsecondary instructors and admissions personnel will find it beneficial in making decisions. The state has already received a statement from the University of Minnesota and the Minnesota State College and University System indicating that they will look for and "use" the profile for admissions purposes. In addition, the University of Minnesota and the Minnesota State College and University System stated that they feel the profile is a "value added" document that provides additional insight and information.

One of the school-to-work coordinators interviewed in Minnesota mentioned another "real challenge" in gaining support for alternative assessment--students. Indeed, at Red Wing, staff members are concerned that this year's 9 [th] graders, as well as those who will be entering the 10 [th] and 11 [th] grades, will perhaps be as resistant as colleges to new assessment methods since "they know how to take a test the old way." The school-to-work coordinator of the Winnacunnet School District in **New Hampshire** voiced similar concern over student acceptance of new assessment techniques. The senior seminar requires students to work with teachers, uncover and investigate a community issue, develop and implement a study focusing on that issue, and propose a solution to the problems highlighted in the study. While a good opportunity to do college-type work, the project was initially met with intense resistance from college prep students who wanted a more traditional assessment scheme.

To eliminate the problem with alternative assessments, New Hampshire's Department of Education, with the assistance of 50 secondary and postsecondary administrators and teachers, is attempting to develop a pilot admissions project at the postsecondary level using competency-based admissions criteria. Facing tremendous internal difficulties with transfer credits, this is an appropriate time for the University of New Hampshire to consider new evaluation schemes. Basing admissions and transfers on student competencies likewise seems prudent. School-to-work reformers must seize this opportunity to work with university officials and bring their new pedagogy and assessment strategies to the table.

A coordinator from a New Visions program in **New York** believes that listing nontraditional school-to-work courses on transcripts "opens up the door" for a dialogue between students and admissions officers during the interview process. In her estimation, the fact that many colleges have no idea what school-to-work courses are or what material they contain could benefit students who will then be given an opportunity to explain the value of their experiences and the knowledge gained through those experiences. Unfortunately, not all colleges require interviews. Moreover, when colleges do grant interviews, students have already been screened based upon a transcript that may or may not be understandable to those assessing it. What may be a benefit to one student, may also be a hindrance to another.

Although**North Carolina** students do not use portfolios at this point, a portfolio assessment model is currently being piloted in seven school systems, representing 20 schools and including grades 4, 8, 10, and 12. In line with the state's strict standardization of education, all students have a "standard electronic transcript" that does include a field for work-based learning. Although many states and state universities are working to include one line on their standardized applications for a student to indicate their participation in a school-to-work experience, many reformers question the benefits of one line in fully capturing the school-to-work experience. The school-to-work coordinator of the Red Wing School District in Minnesota stated that colleges are still unlikely to admit a student with "auto service" on his or her transcript. Not only do school-to-work reformers need alternatives to SAT/ACT measures, those alternatives need to communicate information succinctly and accurately. In addition, reformers need empirical evidence to convince colleges that alternatives are reliable and trustworthy.

Chart 3
Strategies That Build Pedagogically Strong Experiences Outside the Classroom

Strategy Being Implemented	Problems/Obstacles Addressed	How Obstacles Are Overcome	Benefits
EMPHASIZE EFFECTIVE COMMUNICATION			
New York: • Focus groups and surveys to arrive at authentic definitions	Acceptability	• Attempt to remove concern over how reforms are verbalized • Attempt to gain a clear understanding	• By openly communicating, reformers can understand the true meaning behind reform and its implications • Surveys offer a

and promote solid understandings of the components and implications of school-to-work reform • Mail survey to New York State University System by Academic Planning, Policy and Evaluation Group		of the resistance to reforms	new approach for communicating with skeptics and other constituency groups
Vermont: Counselors at Champlain Valley Union High School visit area college admissions offices	Postsecondary Access Acceptability	Interview with college admissions to determine current admissions policies and opinions regarding reforms	• Opportunity to gain firsthand knowledge of postsecondary concerns • Avenue to build strong relationships and minimize misperceptions regarding reform efforts
Maryland: Directed communication between secondary, community college, and four-year faculty	Postsecondary Access Accountability	Faculty started addressing the specific academic skills and knowledge found within applied courses to arrive at a clear understanding	• Communication can find consistencies among course material and focus • Allows for easy conversions between applied and traditional

			• curricula • Uncovered the need to put more pedagogical theory behind applied courses

WORK WITH RECEPTIVE CONSTITUENCIES AND SITUATIONS			
Education Commission of the States: Project to connect work and learning in postsecondary education	Postsecondary Access	• New York: Development of program to encourage postsecondary institutions create strategies to better prepare students for life beyond formal education • Oklahoma: Project to connect secondary with postsecondary institutions and get students interested in geography	• Actual partnerships are being formed between secondary and postsecondary institutions and staff • Authentic work experience of postsecondary institutions can dispel many misperceptions about reforms
Maryland: Top-down support for school-to-work strategies at University of Maryland	Postsecondary Access	• Chancellor is personally involved in school-to-work programs • Upper administration supports research grants sponsored by the university to promote integration and application at the postsecondary	• Programs sponsored at the top offer opportunity for skeptics to witness (and be a part of) authentic teaching and learning • Upper-level support sends a clear message and is necessary to change environmental cultures

		level	
New York: New Visions and Academy of Finance-- Capitalizing on the popularity of health care and business occupations to conquer fears regarding the risks of outside learning experiences	Postsecondary Access Acceptability	• Programs target health care as a venue for expansion due to the wide range of career and academic opportunities available and the lack of opposition. • Support is provided from business to develop strong national programs in areas such as finance.	• Programs can expose students to a professional, well-respected work environment. • Students can work with professionals that are accustomed to the experience and welcome to work-based education. • Highly successful programs offer students a variety of quality options after graduation and can be used as models for other programs.
North Carolina: University of North Carolina science department accepts integrated curriculum as prerequisites in science	Postsecondary Access	• Took six months of negotiation between Department of Education and UNC to accept applied Principles of Technology sequence for college credit. • Science department is the first department in higher education to be receptive to accepting applied courses.	• There is a movement towards greater partnerships with university educators. • Work can be used as a model for other disciplines to follow suit.
Massachusetts: Interdisciplinary	Postsecondary Access Acceptability	• Curriculum emphasizes	Curriculum development at postsecondary level is

undergraduate business curriculum implemented at Babson College		learning by doing, requires integration with liberal arts courses, and gives students autonomy over their education. • Curriculum includes teamwork and mentorship experiences with faculty and employers • Curriculum provides competency-based education approach.	student-centered, integrated, and application-oriented.
UTILIZE PROFESSIONAL DEVELOPMENT ACTIVITIES TO CREATE PARTNERSHIPS			
Maryland: State commitment to training in blended instruction	Postsecondary Access	• Training puts secondary and university personnel into teams. • Teachers must apply for training spots and include a cross-section of personnel. • The University of Maryland offers funding for training to encourage faculty and secondary participation. • Prior to attending conference, grantees must	• Participation in training gets the word out and knowledge is shared in a less threatening environment. • Training program uses a variety of methods to expose university personnel to integration and applied learning.

		attend "intersegmental educators conference."	
Maryland: Towson State University preservice guided work experience requirement for teachers	AccountabilityAcceptability	• There is less lecture and more on-the-job, application-oriented training. • Program is being evaluated externally.	Results of training will provide validity to those participating and those skeptical on the outside of the traditional school.
New Hampshire: Teacher externships called "Educator at the Workplace" Fellowship program	Acceptability	• The program is co-sponsored by State Education Department and University of New Hampshire. • This is a five-week program in which teachers are paid to spend one week attending seminars and three to four weeks at a worksite developing curriculum they specified in their application. • Fellows commit to return to their schools and teach their peers.	• Program will induce buy-in at many levels: secondary and postsecondary education and industry/business. • Teachers gain more from the experience because they are prepared to enter the workplace with specific goals (not just to observe but to participate).
New York: Professional development	Postsecondary Access AccountabilityAcceptability	• Coordinators train with academic	• Opportunities to train with a variety of individuals

opportunities in the New Visions project		teachers, other coordinators, and professionals in their field.	encourage exchange of ideas and minimize skepticism. • The level and sophistication of programs increase with additional input.
SIMULATE COLLEGE AND ADULT EXPERIENCE			
New York: Extensive time in the workplace for New Visions students	Accountability	• Students are given the latitude to budget their own time for completing assignments and projects. • Students spend considerable time out of the classroom with their employers.	• Students are responsible for mature behavior. • The autonomy required from students bridges the gap between college and high school.
Vermont: Graduation Challenge at Champlain Valley Union High School	Accountability	• Students choose an area of interest and pursue their own work-based experience including the attainment of a "community consultant" or mentor outside the school.	• Students gain confidence that they can act like adults and handle adult situations in the real world. • Students learn to budget their time and prioritize.
Florida: Adult environment simulated within McKeel Academy	Acceptability	• School emphasizes proper mature behavior and high levels of performance and, at the same	• Students are directed by adults to learn how to manage their lives before college or work. • Students are more

		time, puts behavior in a skill context. • Students participate in classroom exercises that simulate adult behavior such as keeping accounts.	motivated when they consider their school activities as real-life projects.
MAKE PORTFOLIOS AND ALTERNATIVE ASSESSMENTS MORE "USER FRIENDLY"			
New York: Syracuse University development of new systemwide assessment methods	Accountability Acceptability Postsecondary Access	Syracuse University will analyze current assessment activities and determine how they compare with the kind of outcomes that those in higher education want to see.	• Faculty will engage in a new dialogue and learn better assessment techniques. • Students will learn to articulate and structure their educational experiences so that they can gain the skills they need to succeed.
New Hampshire: Education Department's postsecondary pilot admissions project using competency-based admissions criteria	Accountability Acceptability	School-to-work reformers are seizing the opportunity presented by the State University to educate about new learning strategies.	Opportunity is provided to work with university officials and bring new pedagogy and assessment strategies to the table for discussion.
North Carolina: State portfolio assessment model pilot in grades 4, 8,10, and 12	Accountability	All students have a standard electronic transcript that includes work-based learning.	Reform will expose educators to new types of learning within a familiar framework.
Minnesota: New type of record to document student achievement	Accountability	• The state has uncovered the needs of college admissions	• The new document creates an additional view of student

		personnel. • The state has developed a new dual or two-page transcript that includes traditional and standards-based information. • New document is endorsed by the state university system.	achievement without sacrificing information or time. • New information is being presented with some familiarity.

ADVANCING CAREER AND INTEREST EXPLORATION

While exposing students to a different set of topics and concerns than those presented in traditional courses, offering career exploration opportunities in school does not have to incite fear and anxiety among parents, teachers, and students. Indeed, as the examples below will illustrate, a school's traditional programs, activities, and curricula do not even have to change with the inclusion of career and interest exploration. In many cases, exploration actually adds cohesion to often-disconnected traditional academic courses and motivates students to learn and reflect more. The programs below have sought to include career and interest exploration in their curricula in one of two ways. Some have opted to integrate career concepts and ideas into mandatory courses so that all students can have the same opportunity to explore and reflect before high school graduation. Other programs have redefined "elective" courses and streamlined mandatory courses so that students now make course selections, including their elective courses, that support an overall plan or focus for their lives. All of these successful initiatives operate under the philosophy that there is no need to differentiate students when offering them the opportunity to explore their interests and ambitions.

Moving from "Elective" to "Effective" Courses

The majority of the reformers interviewed for this project resisted the tendency to offer career and interest exploration or instruction to their students as part of an "either/or" school agenda. No longer are these schools structured so that *either* a student takes the traditional, college prep track *or* commits to a school-to-work or vocational track. Instead, these effective initiatives have integrated

their career exploration components into the mainstream in one of two ways. Some schools utilize required courses such as social studies, economics, or civics and government to promote school-to-work ideas and themes and incorporate career-oriented activities and materials. This way, all students receive the same career information and school-to-work ideas and teaching methods. Other schools tightly schedule students' academic courses so school-to-work courses, while still officially considered electives, can be taken without sacrificing the academic or traditional courses that students need for acceptance into selective four-year postsecondary institutions. In both cases, school-to-work ideas and teaching principles have a better opportunity to become a necessary part of the educational experience of all students.

Incorporate Career Exploration into Required Classes

Richfield High School in **Minnesota** sends about 75% of its students to postsecondary institutions. Even though the school was one of the first in the state to incorporate school-to-work and Minnesota Graduation Standards into its classes, the school's student services coordinator admitted that the school still functioned under "a traditional line of courses." Richfield has been able to incorporate career/interest exploration into its mainstream through service learning--a statewide, comprehensive graduation standard that requires students to find a need in the community upon which to center a research project (find original sources, perform a survey, and so on). In addition, the school's 9 th grade social studies classes are embedded with school-to-work principles and offer students a career investigation component. Students in Richfield High School are required to complete "9 th grade projects," which are considered a "no-track elective." In these projects, students work with guidance counselors to develop career portfolios that are assessed by social studies teachers, counselors, and vocational education teachers. The counselors then use the portfolios to keep track of student interests throughout high school.

The New Visions program in **New York** State is considered an "elective" in the sense that the brightest and most motivated seniors can apply to the program only if they have met their academic requirements for graduation and college admissions. The program, designed explicitly for students who want to go to four-year college and have a general idea of their career area, allows students to use the extra credits they have available to them in the 12 th grade to further "refine their career choices." Except for the required physics, mathematics, and foreign language that they take in the morning at their home school, students take the remainder of their classes at the worksite. Although senior English and social studies are interdisciplinary courses taken at the worksite, the state mandates that these courses meet the state standards for their disciplines. One New Visions coordinator has redesigned senior English so that it is now considered an AP equivalent or English honors.[32] Students in this program no longer have to "elect" participating in the New Visions program over taking advanced placement English at their home high schools.

The coordinator in this program feels that maintaining the "honors" designation on courses and acceptable performance on the AP exam are critical to colleges' understanding the program. Although some may consider AP courses to be elective in the same vein as band or competitive sports, these courses are clearly not elective to many of the students that the New Visions program targets. The coordinator said that her interest in the "AP" designation might make her appear to be an elitist among some of her colleagues but that the needs and demands of the community have forced her to

react differently. Clearly, this program offers an option for students that is not the "either/or" scenario often presented to students who are interested in career exposure. Students enrolled in the program have received early admissions to Cornell University and the State University of New York at Binghamton. In 1993, the first year of the program, students attended Cornell, Penn State, and Mary Mount Colleges. Two students in the 1997 class have been wait-listed at Johns Hopkins and Duke University.

A similar type of reform is taking place in the Kingswood Regional High School in **New Hampshire**, a school that sends 50% of its students to four-year colleges and 25% to two-year schools. Kingswood allows honors students to take advantage of vocational-type classes as electives and not lose their class standing for doing so. All vocational or career exploration courses at Kingswood can be taken at the honors level. Students agree to do extra work beyond that required in a standard vocational course, are held to higher standards, and are put on the honors 4.5-grade scale. The courses taken under this plan read "honors level" on the student's transcript. Thus, school-to-work courses have become more of an option for all students, especially those with college aspirations.

To graduate from high school in **Maryland**, every student must take Technology Education--a hybrid vocational course that evolved from an industrial arts course. Students take this course from a technical education teacher instead of an academic teacher. In the process, "teams of kids across all learning levels" work together--something that exemplifies the future workplace activities of all students.

A Better Use of Electives

As competition for acceptance into postsecondary institutions increases, the use of and meaning behind "elective" courses has changed drastically. Many school-to-work coordinators mentioned that colleges, once basing their admission decisions solely on students' first 11 years in school, now look more carefully into senior course selections, grades, and community service activities. Many students fail to realize this and do not take advantage of the elective courses available to them, instead taking "fluff" classes during their senior year. Acceptance to college can be threatened if college admissions officers do not see a rationale and focus in the course choices made by students during their high school career. Many school-to-work programs are capitalizing on this change in admissions philosophy and promote career exploration classes as a way to give students direction and keep them on a traditional college track. To do this, schools have to work closely with students in the planning of courses, extracurricular activities, and work experiences.

Winnacunnet High School in **New Hampshire** requires all students to adhere to a regimented course of study beginning in the early years. Given that all students are required to stay on a highly structured academic track, students have ample time to take career courses as electives in grades 11 and 12. With the Winnacunnet system, students have strong academic backgrounds and enough exposure to career possibilities to develop knowledgeable ideas about what they want to do after high school. In addition, the career-related courses they choose make sense for their interest and aptitudes. Unlike other schools that focus on career development, Winnacunnet maintains AP courses as a central part of its curriculum. Not only does this eliminate parent opposition, but allows the reform effort in the school to maintain its integrity as one that stresses student focus. Students are not

locked into anything.

The school-to-work coordinator at Kingswood Regional High School in **New Hampshire** said that his responsibility is to ensure that students make good use of the eight elective credits (out of 32 total credits) available to them during their three years in high school. The Kingswood program does not force students to make career decisions by placing them into clusters or paths but, rather, concentrates on communication and raising student awareness by using elective credits to open up different opportunities. College offerings and college requirements are a focal point of the internships and career development activities. The school takes advantage of its technology by offering students the use of a software package called CHOICES on CD-ROM that gives students a clear and comprehensive road map for the future. Using CHOICES, students pick a field in which they are interested, find colleges that have programs in that field, and go the internet to college and professional websites to learn their requirements. CHOICES and the career-oriented courses that support it integrate career interests with academic requirements so students know what they are up against when they do choose a career path or cluster.[33]

In addition to internships and job shadows, Kingswood schedules frequent visits from community members for the entire student population. Students also spend days at college campuses and get assistance in understanding how their personality fits into jobs/careers. The school-to-work coordinator noted that the biggest success in his program occurs when kids try something and decide that is not what they want. Career exploration before college saves the student, his parents, and college faculty members much time, effort, money, and frustration.

Syracuse University in **New York** recently criticized for focusing too heavily on research and neglecting student interests and needs, is attempting to integrate a unique career exploration activity into the curriculum for all students. Freshman students, working under the leadership of faculty members in the College of Arts and Sciences, are directed to write an "essay of aspiration."[34] This essay will be used to advise students throughout their college career and may eventually become part of the admissions process and an "electronic portfolio." The document will follow students across the entire campus/university as students learn through their courses and college experiences to self-assess their needs and change direction by taking a conscious inventory. Although the university still has a long way to go to achieve complete faculty buy-in, the program, started in the School of Education and piloted within the College of Arts and Sciences, is supported by services such as Academic Advising, Career Counseling, and the Exploratory Student Program.

In addition, the College of Arts and Sciences at Syracuse University is initiating a Center for Undergraduate Research and Innovative Learning that will allow students to pursue hands-on experiences and apply their knowledge and skills to real-world situations. A major component of the center is its Undergraduate Research Program, designed to link students with the research projects of interested faculty. Although voluntary and elective at this point, many involved in the center feel that giving students and faculty an opportunity to work together in career-related yet academically focused activities will influence students and curriculum in a school-to-work direction.

These two creative yet logical techniques for moving career exploration into the mainstream offer two important benefits for college students. First, the system and the staff are given an opportunity to work out any kinks that exist in the school-to-work system and make the necessary

cultural and logistical changes without causing students to suffer in the process. In other words, students can benefit from the career and interest exploration activities and the school-to-work experience without jeopardizing their current or future learning opportunities. Moreover, parental and student resistance is minimized if not completely avoided since students no longer have the same monumental choices to make and risks to take. By integrating elements of school-to-work into the system in this way, most individuals and institutions can grow to see its benefits in the same way they have grown to demand a "well-rounded education" that includes extracurricular activities such as band, sports, and community service.

No Need To Differentiate Students

Parents are not the only constituency group that fears the integration of career and interest exploration activities into the mainstream curricula. Many of the coordinators that were interviewed in this project were quick to point out that students themselves resist this addition to their traditional academic courseload. Indeed, students often choose not to participate in school-to-work programs and career exploration activities because they fear being identified as "school-to-work students" and being separated from their peers in mainstream or advanced educational programs. A New Visions learning coordinator in **New York** referred to the students in her program, all high academically achieving students, as "risk takers" and pioneers who decided to pursue and explore their career interests. Furthermore, these students were willing to take the chance that colleges might not value their career exploration experience.

Cognizant of the risk that many students take to participate in career exploration activities and work-based learning experience, many school-to-work coordinators and state officials avoid student differentiation by creating programs that minimize program distinctions. For example, although **North Carolina** delineates "college Tech Prep" and "college prep" programs, only two differences actually exist between the programs. Tech Prep students must take four vocational/technical units in one of nine state career pathways; college prep students are free to take any electives they choose. Tech Prep students may take either Geometry/Algebra II or Technical Math whereas college prep students are required to take the Geometry/Algebra II sequence. Surprisingly, a recent review of 1,404 transcripts revealed that, although they are not pushed in that direction, at least 60 to 70% of all college prep completers chose to take at least two vocational/technical courses. Clearly, the distinction between the programs is not as sharp as their program delineation suggests. Furthermore, given that 69 to 70% of schools in the state have converted to block scheduling, students have more optional or elective courses to take and may, in effect, fit into both Tech Prep and college prep categories. Indeed, block scheduling can allow students to graduate with up to 32 units--12 above the 20 units of credit that the state requires.[35] Many in the state also feel that block scheduling helps teachers with their preparation schedules and allows for less lecture time and more active involvement--something that affects all students.

One staff member at the **Minnesota** Department of Children, Families, and Learning stated that he did not find it difficult to convince parents of the value of the school-to-work experience when

things were put in perspective for them and the separation of their children from other students was minimized. In his view, without school-to-work activities, children are being forced to use their postsecondary years as "career exploration"--something that most parents find unwanted and uneconomical.

In a recent **New Hampshire** evaluation, the Moultonborough school-to-work coordinator recalls that her students "didn't even know that they were Tech Prep kids." The **North Carolina** Director of Instructional Services states that there is "no such thing as a school-to-work student," indicating that the state is setting up its system so that it is "difficult to say, these are school-to-work students and these are not . . . ." A **Minnesota** official stated that if you "turn a kid into a historian, history will come alive for the kid." Clearly, students do not have to become employed as historians or be considered school-to-work students in a history cluster to reap the benefits of using the real world of history as a learning tool--something that many of the educators interviewed during this project have grown to realize. One school-to-work coordinator placed a clever spin on school-to-work when she described the college-bound as "students that aren't able to make the transition into immediate employment."

If students feel positive about the opportunities to explore their careers and interests, they are often the best public relations for school-to-work programs. One New Visions program in **New York** gets students to speak at assemblies and market the program as part of their English course. The 20 students participating in the Academic Internship Program (AIP) at Champlain Valley Union High School in **Vermont** have proven to be role models for other non-school-to-work students in the school. Not being forced to sacrifice their honors classes and participating in an internship that is, in many ways, similar to the Graduation Challenge requirement of the entire senior student body,[36] these students were baffled when asked about being in a school-to-work program. During a focus group at the school, one AIP student referred to a different school program as school-to-work and did not seem to connect his current activities working in a veterinarian's office with a vocational experience.

Chart 4
Strategies That Advance Career and Interest Exploration

Strategy Being Implemented	Problems/Obstacles Addressed	How Obstacles Are Overcome	Benefits
MOVING FROM ELECTIVE TO EFFECTIVE COURSES			
Minnesota: Richfield High School's service learning requirement and 9th grade social studies reforms	Acceptability	• Service learning, a statewide requirement, requires students to develop a research project around a community need • 9th grade social studies is	• Career exploration offers no threat to students, teachers, or parents. • Career development is being instituted at a young age and

		• embedded with career investigation • Required 9th grade projects in which students work with guidance counselors to develop career portfolios	gradually.
New York: Selectivity of the New Visions program	Acceptability Accountability	• Students who are accepted to the program must meet all of the academic requirements for graduation and college admissions. • All interdisciplinary courses meet state standards. • Programs value traditional advanced standings and testing.	• This program allows academically achieving students with career direction to use their electives more effectively. • Students are not forced to risk anything by their participation. • By participating in traditional activities and assessments, students offer colleges the information they understand and value regarding their abilities and potential.
New Hampshire: Kingswood Regional High School honors level option for career exploration course; emphasis on career exploration before college	Acceptability	All career exploration courses can be taken for honors credit with the provision of extra work	• School-to-work courses can become more of an option for all students. • Career exploration in the early years saves

			students and parents time, effort, and money in later years.
New Hampshire: Winnacunnet High School required academic course of study for all students with ample time allowed for electives in later years	Accountability	• Highly structured academic track for all students • AP courses are central part of curriculum • Student-centered approach	• Students develop strong academic backgrounds and exposure to career options. • Students select more appropriate career-related course choices because they are involved with previous exploration into their interests and aptitudes. • There has been limited parent opposition.
Maryland: Technology Education as a requirement	Acceptability	• Hybrid vocational course that evolved from industrial arts course • Course taught by technical education teacher	• Students from all areas work together and have the opportunity to dispel many stigmas.
New York: Syracuse University "Essays of Aspiration" required for all freshman and career-related academically focused research projects	Postsecondary Access Acceptability	• Essay used to advise students and may become a part of admission process • Essay becomes a living document to follow students across their college education • Research projects	• The knowledge students gain in their courses can be directly applied to their career inventory and aspirations. • Research projects offer students the opportunity to work with faculty on a one-on-one

		link student with academic faculty member	basis and has the potential to influence curricula. • System and staff have the opportunity to work out kinks and make changes without causing harm to student educational experiences. • Parent and student resistance is minimized since risk is removed.
NO NEED TO DIFFERENTIATE STUDENTS			
Programs in North Carolina, Minnesota, New Hampshire, and New York that minimize distinctions between students	Acceptability	All students are offered options that involve career exploration but no drastic changes are made to their educational opportunities based upon these choices.	• Students, parents, and teachers are not opposed to additional exposure that does not pose any future threat to educational and career opportunities. • Instead of students using their postsecondary years as career exploration, high school gains a deeper purpose.

CONCLUSION

IEE researchers interviewed a wide range of individuals from around the country whose organizations are developing or implementing school-to-work programs. Many programs are worthy of acclaim; they have used school-to-work to enhance their students' potential of being accepted to and, more importantly, graduating from college. Many efforts have taken advantage of the latitude offered under the School-to-Work Opportunities Act of 1994 to create programs that, first and foremost, meet the needs of students. At least initially, this may not translate into a strict adherence to the three school-to-work components set forth in the act. Instead of trying to provide an increasing number of students with work-based, school-based, and connecting activities, educators are attempting to reform entire schools and offer a locally tailored, application-oriented, quality education to all students. Schools search for ideas and approaches that work regardless of what they are named. In many instances, programs with weaker connections to the formal school-to-work establishment have greater opportunities to create successful, mainstream reforms. Indeed, efforts to adhere too closely to the school-to-work triad and label students and their programs have failed to ignite the kinds of broad-based changes that reformers envisioned.

The programs investigated in this project illustrate the deep, philosophical changes that must take place outside and inside the school if school-to-work is to become a mainstream reform that touches the lives of all students. This report has attempted to present the strategies that quality programs have used to promote school-to-work ideals. These strategies are discussed in terms of one of three broad-based principles that school-to-work supports: (1) authentic teaching and learning, (2) guided educational experiences outside the classroom, and (3) career and interest exploration. Below is a recap of the strategies that many stellar school-to-work systems have used.

1. **Seize the opportunity that integrated standards present; use standards as a vehicle to promote the same authentic teaching and learning strategies that the school-to-work ideology embraces.**

   School-to-work administrators at both the local and state levels are in a remarkable position. They can take part in the growing cohesion between the academic and business communities based largely upon the shared support of application-oriented standards. Seizing an opportunity to share this support, school-to-work systems and states are structuring the authentic pedagogy around these more integrated standards. By using authentic pedagogy to teach application-oriented standards, school-to-work programs are demonstrating in tangible, measurable terms to students, parents, teachers, and academic institutions that this new reform agenda is perhaps the best way to offer all students the skills and knowledge they need to succeed. If, as one school-to-work administrator stated, application-oriented standards are to become the base or the "what" of what an educated person is expected to be, it is vital that school-to-work reformers function as key players in the development, implementation, and evaluation of those standards. School-to-work success stories will no longer be anecdotal but, rather, tangible proof of the benefits of the reform.

   This does not mean that the use of a standards-based curriculum in promoting the authentic teaching and learning strategies of school-to-work is without problems or obstacles. Carnegie

Units are still widely used and accepted in the United States. Furthermore, teachers, both those in training and those in today's classrooms, are in need of professional development in order to become competent practitioners in new authentic learning and teaching methods. Third, there may be difficulty maintaining high levels of student performance as standard-based reforms and new application-oriented assessments are being instituted. This is a justifiable concern to students as well as their parents, teachers, and the postsecondary institutions to which they will be applying. Clearly, there is much work to do in achieving a well-functioning, standards-based educational system. That work must begin with a solid and well-structured implementation plan consisting of communication, professional development, and efforts to develop and fully test curricula and assessment instruments.

2. **Become a "work-in-progress"; support authentic teaching and learning strategies and work to slowly overcome the obstacles and misperceptions of school-to-work. Never lose sight of the real focus of school-to-work--the application of knowledge.**

Although not fully embraced in all classrooms around the country, authentic learning and teaching has a stronger base of support than school-to-work programs that seek to incorporate employer needs and workplace scenarios into educational activities and academic curriculum. Authentic teaching and learning promotes a strong interdisciplinary and applied learning system that can be used to reform the entire school and support school-to-work. Successful programs seem to understand that simply moving instruction into the workplace will not ensure the growth and development of school-to-work. Programs must concentrate on ensuring that quality learning takes place that will enable students to apply their knowledge and not simply regurgitate it. For this reason, many of the successful school-to-work programs investigated during this project have first concentrated their energies on less controversial aspects of the reform such as authentic teaching and learning. They avoid using school-to-work titles and terminology that often promote misperceptions and fear.

Despite the benefits of using authentic learning as a bridge to slowly promote school-to-work among hesitant individuals, there are dangers involved with slow, broad-based reform efforts. Local districts must be encouraged to personalize reforms to meet their needs but still must operate under some control from the state to ensure a unified direction. The state, under more stringent criteria than the local level to maintain positive outcomes and equity, is placed in the difficult role of keeping interest and enthusiasm high at the local level and offering some autonomy in program development. It is also difficult for all levels to maintain proper documentation when programs are in such an evolutionary phase. Teachers may find it difficult to report student achievement in a format that advances reform efforts yet is still familiar to higher education institutions, parents, and employers. This difficulty can prompt teachers to work against reform and advocate a more structured, static system.

3. **Use innovative ways to promote the use of guided experiences outside the classroom and minimize the obstacles that come from workplace involvement in education.**

Unless otherwise convinced, some parents, students, and teachers believe that "vocational-sounding" programs such as school-to-work simply offer employers cheap labor and allow students the opportunity to file documents or answer phones.

- *Shy away from using traditional school-to-work jargon.*

  Words that are associated with vocational education conjure up concerns that are difficult to dispel. Arriving at a common language and understanding of common goals and objectives takes time but offers hope for advancement in the use of work-based learning experiences for all students.

- *Work with receptive constituencies to develop a more supportive environment for outside educational experiences; nurture and seek involvement from groups that are already accustomed to the hands-on learning experience.*

- *Many school-to-work programs around the country are creating strong partnerships with application-oriented fields such as science and business. Once these programs succeed in using guided work experiences to train high-quality professional practitioners and students, school-to-work programs accumulate a proven track record of successes that can overcome the negative opinions and hesitations found in other fields. In addition, many programs take advantage of the opportunities to connect employers and educators through professional development programs now referred to as externships. These externships offer educators the opportunity to see firsthand what advantages the workplace can offer students. By participating in staff development exercises in the workplace, a partnership develops in which educators and employers, at all levels, can work together to solve future educational needs. The proliferation of positive professional development experiences allows the school-to-work movement to cast a broader net; those involved can use their own experiences to promote the reform more authentically to a wide audience.*

4. **Focus on the idea that using the workplace offers opportunities for students to demonstrate adult behavior and take on additional responsibilities required in college.**

   One of the primary benefits that guided learning experiences outside of the classroom can offer students is an opportunity to function as more independent, mature individuals in a controlled environment with a strong support system of teachers and other concerned adults. Offering a guided learning experience to students makes it easier for high schools to emulate the autonomous environment that college students and adults face. Quality learning experiences offered outside the classroom allow even the best-prepared academic students to be spared the culture shock that often comes from entering the college community and the "real" world.

5. **Offer postsecondary institutions, parents, academic teachers, and students alternative ways to report and interpret skills and knowledge; supply options that meet traditional needs, while at the same time, present the richness of skills and abilities that students gain through guided experiences outside the classroom.**

   Even postsecondary institutions that appear to have embraced experiential learning are often reluctant to abandon traditional admissions measures such as ACT and SAT scores in favor of skills and knowledge learned outside the classroom and reported in portfolios, résumés,

references, and essays. School-to-work programs must offer hesitant individuals the opportunity to understand the benefits of a new way of learning and reporting skills but still allow them to take part in a system they know and believe in. Successful programs investigated during this project offered options for students, teachers, and parents so that they were exposed to the alternatives that guided learning experiences offer.

6. **Be more effective with the use of "electives" or the credits that have traditionally been considered or labeled career or interest exploration courses.**

   A school's traditional programs, activities, and curricula do not have to change with the inclusion of career and interest exploration. Programs can opt to integrate career concepts and ideas into mandatory courses so that all students gain the same opportunity to explore and reflect before high school graduation. This integration can be done without losing the academic rigor required in college-level courses. Moreover, programs can redefine elective courses and streamline mandatory courses so that students now make course selections that support an overall plan or focus for their lives. Students are not forced to make difficult choices between investigative courses and academic curricula.

7. **Focus on one philosophy regarding career and interest exploration. There is no need to differentiate students based upon when they choose to enter the workplace; all students benefit by being offered the opportunity to explore their interests and ambitions.**

   Ironically, programs can offer greater support for the school-to-work movement if they *do not* classify their students as "school-to-work" or "non-school-to-work" students. If programs are structured so that all students are offered the opportunity to explore career options and benefit from such exploration, the most difficult school-to-work obstacle can be overcome--the needless categorization of students.

   Empirical evidence is perhaps the most convincing argument for change. Programs that commit themselves to documenting the effects of their efforts will meet less resistance. Much needs to be, can be, and has been done to make school-to-work a reform that enhances student options after high school. Educators must remember that it is not sufficient to place students in jobs. Students must be given (or encouraged to get) quality work-based learning experiences that offer them the opportunity to mature and obtain the skills that will strengthen their classroom performance. Likewise, as a measure of success, it is not sufficient for an increasing number of school-to-work students merely to be accepted to college; they must thrive while in college and graduate. Avid opponents are being increasingly convinced that school-to-work offers the most powerful pedagogy and principles available to support changes taking place at the workplace and in the world.

REFERENCES

Bailey, T. (1997). *Integrating academic and industry skill standards* (MDS-1001).Berkeley: National Center for Research in Vocational Education, University of California, Berkeley.

Bailey, T., & Merritt, D. (1995). *Making sense of industry-based skill standards* (MDS-777).Berkeley: National Center for Research in Vocational Education, University of California, Berkeley.

Bailey, T., & Merritt, D. (1997). S*chool-to-work for the college bound* (MDS-799). Berkeley: National Center for Research in Vocational Education, University of California, Berkeley.

Cargill, U. B. (1994). Transition experiences of high school students planning to attend college. In A. J. Pautler, Jr. (Ed.), *High school to employment transition: Contemporary issues* (Vol. 9) (pp. 129-138). Ann Arbor, MI: Prakken Publications, Inc.

Dewey, J. (1966). *Democracy and education.* New York: The Free Press.

Forman, S., & Steen, L. (1999). *Beyond eighth grade: Functional mathematics for life and work* (MDS-1241). Berkeley: National Center for Research in Vocational Education, University of California, Berkeley.

Grubb, W. N., & Lazerson, M. (1974). *American education and vocationalism: A documentary history, 1870-1970.* New York: Teachers College Press.

Langenberg, D. (1997, September). Diplomas and degrees are obsolete. *Chronicle of Higher Education,44*(3), A64.

New Hampshire State Board of Education. (1993). *New Hampshire Minimum Standards for Public School Approval.* Concord: Author.

Newmann, F., & Wehlage, G. (1995). *Successful school restructuring: A report to the public and educators by the Center on Organization and Restructuring of Schools.* Madison: Wisconsin Center for Education Research.

Packer, A. H., & Pines, M. W. (1996). *School-to-work.* Larchmont, NY: Eye on Education.

State University of New York System Administration, Academic Planning, Policy and Evaluation Group. (1998, January). *Postsecondary school-to-work survey.* Albany: Author.

APPENDIX 1
STATE-LEVEL PROTOCOL (FOR

POLICYMAKERS)

1. A *rough overview* of the **History of School-to-Work** in the state:

   - The philosophy that went into building school-to-work. Does it target high academically achieving students (college bound, vocational, or both)?

   - The extent that school-to-work fits into the overall school reform agenda.

   - Lead offices/players for school-to-work activities--Economic Development Office, School-to-Work Office, Department of Education.

2. Extent of the **Involvement of Postsecondary Institutions** in school-to-work reform:

   - Have/are postsecondary institutions at the table? When did they get involved? Who got involved?

   - In what capacity do postsecondary institutions get involved (professional development, assessment)? Do Schools of Education get involved with externships and the development of applied curricula? Do admission offices get involved in the development of competency-based assessment tools to replace traditional admissions tools? and so on.

3. The state's use of **Standards**:

   - How important are standards in school-to-work reform?

   - What type of standards reform is taking place in the state? What are the obstacles in the state to standards? (emphasize the role of postsecondary institutions in standards development)

   - Concentrate on key areas: competency- and/or performance-based standards and integration.

4. The state's use of new **Assessment** tools:

   - Portfolios--type(s) of college admissions resistance; likelihood that portfolios will benefit students in college admissions process; state action(s) to promote change.

   - Competency-/performance-based--degree that postsecondary institutions are cognizant of issues surrounding comparability or portability when using traditional assessment methodologies to admit students.

5. New activities surrounding **Professional Development**:

   - Is professional development a state priority?

- Toward whom is it being geared?

- Are Schools of Education involved? How?

- Are other discipline areas in colleges involved? How?

- Are there externships? Any involvement in developing an applied curriculum?

- Any opportunity for teamwork?

6. The state's use of *Articulation Agreements*:

   - Is articulation used as a strong institutional linking tool or structured on a course-by-course basis?

   - Does articulation focus mainly on Tech Prep and community colleges or four-year institutions?

7. *Parents*--types of resistance and ways to overcome.

8. *Recommended Contacts/Programs*--request additional names/contacts.

LOCAL-LEVEL PROTOCOL (SCHOOL-TO-WORK COORDINATORS, TEACHERS, COUNSELORS, AND SO ON)

1. A rough overview of the *History of School-to-Work* in the school:

   - Has the school been sold on school-to-work? What faculty members are skeptical? Why?

   - Who are the school-to-work movers and shakers in the school and how are they moving and shaking?

   - Has there been any major restructuring in the school based on school-to-work or is the program isolated to a few kids and a few faculty?

2. *Involvement of Postsecondary Institutions*:

   - Who works with postsecondary institutions?

   - How involved are these faculty members with the postsecondary institutions? How would you characterize the relationships between key school contacts and postsecondary people?

3. • New *Assessment* tools:

    • How are school-to-work programs described on transcripts?

    • Is there college resistance to changing transcripts? Explain.

    • Portfolios--Do colleges use them? Get more details.

    • Performance-based assessments--Do any work at the local level?

4   • *Standards:*

    • Is the school using state standards?

    • What is the effect of the standards on the reforms that are taking place in the school?

    • Focus on key areas: competency-based, performance-based, integration, classroom, and so on.

5. • *Professional Development:*

    • What type of professional development is taking place in the school? Externships? Internships?

    • Who is funding it?

    • Outcomes?--success getting faculty participation, business participation, future for professional development, and so on

6. • *Parents*--types of resistance and ways to overcome it.

7. • *Articulation* (perhaps not a major point at the local level):

    • Are any students taking college classes while in high school? Explain the system.

    • Is articulation information focused on Tech Prep and community colleges?

APPENDIX 2
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[Note: Kelly Foley was a former assistant to the commission. She no longer works at this office.]

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APPENDIX 3
MINNESOTA: HIGH SCHOOL LEVEL REQUIREMENTS
IN THE TEN HIGH STANDARDS LEARNING AREAS

1. *Read, View, and Listen: Read, view, and listen to complex information in the English language.*

    Choose 1

- Read Complex Information

- Technical Reading

2. *Write and Speak: Write and speak effectively in the English language.*

   Choose 1

   - Academic Writing

   - Technical Writing

   Choose 1

   - Public Speaking

   - Interpersonal Communication

3. *Arts and Literature: Apply and interpret artistic expression.*

   Two Required

   - Literary/Arts Creation/Performance

   - Literature/Arts Analysis & Interpretation

4. *Math Applications: Solve problems by applying mathematics.*

   Required

   - Space, Shape & Measurement

   Choose 1

   - Discrete Mathematics

   - Chance & Data Analysis

   Choose 1

   - Algebraic Patterns

   - Technical Applications

5. *Inquiry: Conduct research and communicate findings.*

Choose 1

- Math Research
- History of Science
- History Through Culture
- History of the Arts
- World History & Cultures
- Recorders of History
- Issue Analysis

Choose 1

- Research Process
- Social Science Processes
- Research & Create a Business Plan
- Market Research
- CaseStudy
- New Product Development

6.   *Scientific Applications: Understand and apply scientific concepts and methods.*

Choose 2

- Concepts in Biology
- Concepts in Chemistry
- Concepts in Physics
- Earth & Space Systems
- Environmental Systems

7.   *People and Cultures: Understand interactions among people and cultures.*

Three Required

- Themes of U.S. History

- U.S. Citizenship

- Diverse Perspectives

Choose 1

- Human Geography

- Institutions & Traditions in Society

- Community Interaction

8. *Decision Making: Use information to make decisions.*

    Two Required

    - Individual/Community Health

    - Physical Education & Fitness

    Choose 1

    - Career Investigation

    - Occupational Experience

9. *Resource Management: Manage resources for a household, community, or government.*

    Required

    - Economic Systems

    Choose 1

    - Natural/Managed Systems

    - Personal/Family Resource Management

    - Business Management

    - Financial Systems

    - Technical Systems

10. *World Languages: Communicate in a language other than English.*

Optional

APPENDIX 4
MARYLAND SKILLS FOR SUCCESS

Goal 1: Learning Skills
The student will plan, monitor, and evaluate his or her own learning by . . .

Expectation 1: The student will establish and pursue clear and challenging goals and plans for learning by . . .

- developing short- and long-range goals for learning

- developing plans to support achievement of learning goals

- implementing learning plans, using appropriate resources, skills, and learning strategies

Expectation 2: The student will monitor progress, solve problems, and evaluate his or her own learning experiences by . . .

- monitoring progress when learning

- identifying and evaluating problems that may interfere with learning

- persevering when appropriate, in difficult learning situations

- identifying and adapting, as necessary, to difficulties in learning and to changing needs and situations

- evaluating learning experiences and plans

Expectation 3: The student will apply acquired knowledge, skills, and strategies effectively in new learning situations by . . .

- identifying and evaluating new learning opportunities

- identifying similarities and differences between old and new learning situations

- identifying and using knowledge, skills, or strategies as appropriate in new learning situations

- evaluating the usefulness of acquired knowledge, skills, and strategies in new learning situations

Goal 2: Thinking Skills
The student will think creatively, critically, and strategically to make effective decisions, solve problems, and achieve goals.

Expectation 1: The student will generate and evaluate creative ideas in a variety of situations by . . .

- developing alternative perspectives or ways of thinking and acting in complex situations

- representing creative ideas in verbal or nonverbal forms appropriate to purposes and situations

- testing and evaluating creative ideas before adopting them

Expectation 2: The student will evaluate ideas, information, issues, and positions critically by . . .

- identifying key ideas and issues in complex situations

- evaluating the relevance and usefulness of supporting information in ideas and issues

- examining basic concepts and assumptions underlying ideas, issues, or positions

- establishing clear criteria for evaluating ideas, issues, or positions

- recognizing bias, vested interests, stereotyping, manipulation, and misuse of information

- using evidence and/or reason to support or refute ideas, issues, or positions

Expectation 3: The student will demonstrate strategic thinking to make effective decisions, solve problems, and achieve goals in a variety of situations by . . .

- demonstrating an awareness of his or her own strategic thinking and that of others

- framing questions, problems, and issues strategically in specific situations

- identifying performance goals appropriate to available resources, skills, and situations

- identifying alternative strategies to achieve performance goals

- planning and following steps to make effective decisions and achieve goals

- monitoring, evaluating, and making necessary adjustments in goals, plans, or actions

Expectation 4: The student will solve problems systematically and rationally by . . .

- understanding situations within which problems are embedded

- defining problems in specific situations

- identifying and evaluating alternative ways of solving problems

- selecting and using appropriate strategies to solve problems

- evaluating solutions and strategies used to solve problems

Goal 3: Communication Skills

The student will plan, participate in, monitor, and evaluate communication experiences in a variety of situations.

Expectation 1: The student will plan for successful communication experiences by . . .

- identifying purposes, intended audiences, proposed messages, and specific situations for communicating

- identifying appropriate means for delivering messages for a variety of purposes, audiences, and situations

- constructing spoken and other messages in forms appropriate to purposes, audiences, and situations

- using writing skills and strategies to construct written messages

- practicing, when possible, before attempting to communicate

Expectation 2: The student will gather, manage, and convey information using a variety of skills, strategies, resources, and technologies by . . .

- gathering information from a variety of sources, using appropriate strategies, resources, and technologies

- using listening skills and strategies to gather and interpret verbal and nonverbal messages

- using reading skills and strategies to gather information and interpret written messages

- evaluating the usefulness of information gained for specific purposes

- organizing, storing, and accessing information, using appropriate written, graphic, electronic, or other formats

- conveying information and messages, using strategies and means appropriate to audiences, purposes, and situations

Expectation 3: The student will monitor, problem-solve, and evaluate communication experiences by . . .

- monitoring ongoing communication processes

- identifying communication problems and solving them as necessary

- evaluating success in achieving purposes

- evaluating the effectiveness of communication strategies and technologies for audiences, purposes, and situations

Goal 4: Technology Skills
The student will understand, use, and evaluate the uses of current technologies for a variety of purposes in a rapidly changing technological society.

Expectation 1: The student will understand and evaluate the uses of current technologies for a variety of purposes and situations by . . .

- identifying and using resources and strategies for keeping abreast of advances in technologies

- identifying and describing current technologies used to meet a variety of needs, including accessing and managing information, communicating, performing work, and solving problems in a variety of situations

- evaluating the uses of current technologies in specific situations

- identifying needs not being met by current technologies and emerging technological solutions that may meet those needs

Expectation 2: The student will use technologies effectively for a variety of purposes and situations by

. . .

- using technologies in a safe and effective manner

- using technologies in a legal and ethical manner

- using appropriate technologies to access, store, manage, analyze, and communicate information

- using appropriate technologies for research, creativity, and problem solving

- monitoring, evaluating, and planning to improve personal uses of technologies

Expectation 3: The student will demonstrate an understanding of the impact of technologies on individuals, society, and the environment by . . .

- analyzing the effects of technologies on individuals, society, and the environment

- evaluating the effects of technologies on individuals, society, and the environment in a variety of situations

Goal 5: Interpersonal Skills
The student will work effectively with others and participate responsibly in a variety of situations.

Expectation 1: The student will demonstrate effective interaction strategies in groups by . . .

- accepting responsibility for personal actions and contributions to group activities

- showing respect and empathy for others in group activities

- using feedback to adjust behavior in group activities

Expectation 2: The student will work cooperatively with others in a variety of group situations by . . .

- participating in developing goals for group activities

- participating in developing rules and procedures for group activities and following them

- demonstrating understanding of and assuming various roles in group activities

- contributing personal resources to group activities

- supporting group decisions and respecting dissenting positions

- helping to identify and resolve conflicts and bringing groups to consensus

- helping to identify and resolve conflicts and bringing groups to consensus when appropriate

Expectation 3: The student will monitor, evaluate, and plan improvements in group performance by . . .

- monitoring individual and group performance in group activities

- evaluating individual and group performance, using explicit criteria

- planning improvements in individual and group performance

Expectation 4: The student will function as a responsible citizen by . . .

- participating in democratic decisionmaking processes in a variety of social situations

- making reasoned consumer decisions in a variety of situations

- managing financial resources responsibly

- planning and acting in support of communities

Source: Maryland High School Assessment Core Learning Goals, Skills for Success website:
www.mcps.k12.md.us/curriculum/socialstd/MSPAP/SFS_Interpers.html

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APPENDIX 5
NEW YORK STATE LEARNING STANDARDS

English/Language Arts
Standard 1: Students will listen, speak, read, and write for information and understanding. As listeners and readers, students will collect data, facts, and ideas; discover relationships, concepts, and generalizations; and use knowledge generated from oral, written, and electronically produced text. As speakers and writers, they will use oral and written language that follows the accepted conventions of the English language to acquire, interpret, apply, and transmit information.

Standard 2: Students will read and listen to oral, written, and electronically produced text and performances from American and world literature; relate texts and performances to their own lives; and develop an understanding of the diverse social, historical, and cultural dimensions the texts and performances represent. As speakers and writers, students will use oral and written language that follows the accepted conventions of the English language for self-expression and artistic creation.

Standard 3: Students will listen, speak, read, and write for critical analysis and evaluation. As listeners and readers, students will analyze experiences, ideas, information, and issues presented by others using a variety of established criteria. As speakers and writers, they will use oral and written language that follows the accepted conventions of the English language to present, from a variety of perspectives, their opinions and judgments on experiences, ideas, information, and issues.

Standard 4: Students will listen, speak, read, and write for social interaction. Students will use oral and written language that follows the accepted conventions of the English language for effective social communication with a wide variety of people. As readers and listeners, they will use the social communications of others to enrich their understanding of people and their views.

Mathematics, Science, and Technology
Standard 1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions.

Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.

Standard 3: Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.

Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.

Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.

Standard 6: Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning.

Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.

Career Development and Occupational Studies
Standard 1: Students will be knowledgeable about the world of work; explore career options; and relate personal skills, aptitudes, and abilities to future career decisions.

Standard 2: Students will demonstrate how academic knowledge and skills are applied in the workplace and other settings.

Standard 3a: Students will demonstrate mastery of the foundation skills and competencies essential for success in the workplace.

Standard 3b: Students who choose a career major will acquire the career-specific technical knowledge/skills necessary to progress toward gainful employment, career advancement, and success in postsecondary programs.

The Arts
Standard 1: Students will actively engage in the processes that constitute creation and performance in the arts (dance, music, theatre, and visual arts) and participate in various roles in the arts.

Standard 2: Students will be knowledgeable about and make use of the materials and resources available for participation in the arts in various roles.

Standard 3: Students will respond critically to a variety of works in the arts, connecting the individual work to other works and to other aspects of human endeavor and thought.

Standard 4: Students will develop an understanding of the personal and cultural forces that shape artistic communication and how the arts in turn shape the diverse cultures of past and present society.

Languages Other Than English
Standard 1: Students will be able to use a language other than English for communication.

Social Studies
Standard 1: Students will use a variety of intellectual skills to demonstrate their understanding of major ideas, eras, themes, developments, and turning points in the history of the United States and New York.

Standard 2: Students will use a variety of intellectual skills to demonstrate their understanding of major ideas, eras, themes, developments, and turning points in world history and examine the broad sweep of history from a variety of perspectives.

Standard 3: Students will use a variety of intellectual skills to demonstrate their understanding of the geography of the interdependent world in which we live--local, national, and global--including the

distribution of people, places, and environments over the Earth's surface.

Standard 4: Students will use a variety of intellectual skills to demonstrate their understanding of how the United States and other societies develop economic systems and associated institutions to allocate scarce resources, how major decisionmaking units function in the United States and other national economies, and how an economy solves the scarcity problem through market and nonmarket mechanisms.

Standard 5: Students will use a variety of intellectual skills to demonstrate their understanding of the necessity for establishing governments; the governmental system of the United States and other nations; the United States Constitution; the basic civic values of American constitutional democracy; and the roles, rights, and responsibilities of citizenship, including avenues of participation.

Health, Physical Education, and Home Economics
Standard 1: Students will have the necessary knowledge and skills to establish and maintain physical fitness, participate in physical activity, and maintain personal health.

Standard 2: Students will acquire the knowledge and ability necessary to create and maintain a safe and healthy environment.

Standard 3: Students will understand and be able to manage their personal and community resources.

APPENDIX 6
EXCERPTS FROM NEW HAMPSHIRE CURRICULUM FRAMEWORKS

Four Curriculum Frameworks:

1. *English Language Arts*
   Reading
   Writing
   Speaking, Listening, and Viewing
   Literature
   English Language Usages
2. *Mathematics*
   Problem Solving and Reasoning
   Communication and Connections

Numbers, Numeration, Operations, and Number Theory
Geometry, Measurement, and Trigonometry
Data Analysis, Statistics, and Probability
Functions, Relations, and Algebra; Mathematics for Change
Discrete Mathematics

3. *Science*
   Science as Inquiry
   Science, Technology, and Society
   Life Science
   Earth/Space Science
   Physical Science
   Unifying Themes and Concepts

4. *Social Studies*
   Civics and Government
   Economics
   Geography
   History

K-12 Broad Goals for English Language Arts

These goal statements establish general expectations of what New Hampshire students should know and be able to do in English language arts at the end of grade twelve. They will be attained as students acquire the facts, concepts, skills, and processes enumerated under each of the five organizing strands--(1) reading; (2) writing; (3) speaking, listening, and viewing; (4) literature; and (5) English language uses--presented in this curriculum framework.

- Students will read fluently, with understanding and appreciation.

- Students will write effectively for a variety of purposes and audiences.

- Students will speak purposefully and articulately.

- Students will listen and view attentively and critically.

- Students will understand, appreciate, interpret, and critically analyze classical and contemporary American and British literature as well as literary works translated into English.

- Students will use reading, writing, speaking, listening, and viewing to gather and organize information; communicate effectively; and succeed in educational, occupational, civic, social, and everyday settings.

Societal Goals for Mathematics

We believe the goals for New Hampshire schools are closely aligned with those espoused by various national commissions and groups in their efforts to reshape the mathematics curriculum. We commit to five primary goals. That

- *all students* will develop a firm grounding in essential computational skills.

- *all students* will develop strong mathematical problem-solving and reasoning abilities.

- *all students* will develop positive attitudes about mathematics.

- *all students* will develop the ability to use appropriate technology to solve mathematical problems.

- *all students* will develop the ability to communicate their understanding of mathematics effectively.

K-12 Broad Goals for Science Education

These goals will be attained as students acquire the knowledge and use the processes defined and explained in the six curriculum strands in this document.

- Students will demonstrate an understanding of the basic laws which govern and explain phenomena observed in the natural world.

- Students will demonstrate an understanding of, and be able to practice, the basic processes which scientists use to obtain and continually revise knowledge about the natural world.

- Students will use problem-solving strategies to investigate and understand the natural world.

- Students will recognize and understand the wide variety of similarities and differences that exist among objects and events in the natural world.

- Students will demonstrate an understanding of key concepts and principles central to the biological, physical, and earth sciences, while recognizing the interrelationship of all the sciences.

- Students will use oral and written communication, mathematical representation, and physical and conceptual models to describe and explain scientific concepts and ideas, and will be able to apply scientific knowledge.

- Students will know and employ safe practices and techniques in the laboratory, in field work or any other scientific investigation, and when using scientific or technological materials at home or work.

- Students will perceive that scientific knowledge is the result of the cumulative efforts of people, past and present, who have attempted to explain the world through an objective, peer-

tested, rational approach to understanding natural phenomena and occurrences.

- Students will demonstrate an understanding of the impact of science and technology on society.

- Students will be able to use science and technology to creatively address issues in their personal and social lives and careers.

- Students will be able to apply rational, creative-thinking, and investigative skills and use scientific knowledge in their roles as citizens, workers, family members, and consumers in an increasingly technological society.

- Students will display a sense of curiosity and wonder about the natural world, and demonstrate an increasing awareness of the interdependence between all living things and the environment.

K-12 Broad Goals for Social Studies Education

These goal statements establish general expectations of what New Hampshire students should know and be able to do in the social studies at the end of grade twelve. They were drawn from the goals established in the *New Hampshire Minimum Standards for Public School Approval* (New Hampshire State Board of Education, 1993). These broad goals will be attained as students acquire the knowledge, concepts, skills, and processes set forth under each of the organizing strands presented in this curriculum framework.

- Students will demonstrate a thorough understanding of the fundamental principles, organization, and operation of government at all levels in the United States.

- Students will understand and accept the responsibilities of citizenship and share in the rights and benefits granted to citizens as expressed in the Declaration of Independence and the Constitutions of the United States and New Hampshire.

- Students will demonstrate a thorough understanding of economic concepts, including the American system of economics and its contributions to the development of our nation.

- Students will demonstrate a thorough knowledge of the geography of New Hampshire, the United States, and the world and understand the impact of geography on political, economic, and social developments.

- Students will demonstrate an awareness of and concern for the ways that the world's people, resources, and environments are interrelated and interdependent.

- Students will demonstrate a thorough knowledge of the history of their community, New Hampshire, the United States, Western civilization, and the world, including the contributions of famous men and women, ordinary citizens, and groups of people.

- Students will demonstrate a thorough understanding of and appreciation for the heritage of our

nation, including its ideals, principles, institutions, and collective experiences.

- Students will be able to read and examine narratives, documents, and other evidence of the past to clarify, illustrate, or elaborate upon their understanding of history.

- Students will be able to examine cause and effect, review chronologies, consider ideas, and analyze trends in order to understand the past and the present and prepare for the future.

- Students will be able to use the knowledge, skills, principles, and ideals of civics and government, economics, geography, history, and other fields of the social studies to understand and address contemporary problems and issues.

Source: www.state.nh.us/doe/nheiap.htm

APPENDIX 7
VERMONT FRAMEWORK OF STANDARDS AND LEARNING OPPORTUNITIES

Vital Results

Communication Standards:

- Reads to understand and reads critically to interpret a variety of materials

- Writes effectively for a variety of purposes

- Listens actively for a variety of purposes

- Expresses self with power and purpose

- Uses the tools of information technology to communicate

Reasoning and Problem-Solving Standards:

- Asks meaningful questions

- Chooses and uses effective means of solving problems

- Approaches problem solving with an open mind, healthy skepticism, and persistence

- Thinks abstractly and creatively

Personal Development Standards:

- Develops a sense of unique worth and personal competence

- Makes healthy choices

- Makes informed decisions

- Develops productive and satisfying relationships with others

- Demonstrates the skills necessary to participate in the workplace

Civic/Social Responsibility Standards:

- Learns by serving others, and participates in democratic processes

- Respects and values human diversity as part of our multicultural society and world

- Understands continuity and changes

Fields of Knowledge

Arts, Language, and Literature Standards:

- Critical Response

- Literature and Media

- The English Language

- Non-Native Language

- Artistic Process

- Elements, Forms, and Techniques in the Arts

History and Social Sciences Standards:

- Critical Evaluation

- History

- Geography

- Citizenship

- Diversity and Unity

- Economics

- Conflicts and Conflict Resolution

- Identity and Interdependence

Science, Mathematics, and Technology Standards:

- Inquiry, Experimentation, and Theory

- Mathematical Understanding

- Mathematical Problem Solving and Reasoning

- Systems

- Space, Time, and Matter

- The Living World

- The Universe, Earth, and the Environment

- Design and Technology

Source: Vermont Department of Education. (1996, Spring). *Vermont's Framework of Standards and Learning Opportunities.* Montpelier: Author.

APPENDIX 8
VERMONT GRADUATION CHALLENGE

PRESENTATION REVIEW ASSESSMENT

Delivery

High Quality:

- Student was clear and confident.

- Student's delivery holds the audience's attention from beginning to end.

- Student makes direct eye contact.

Acceptable:

- Frequent eye contact but refers to notes occasionally.

- Student makes a few distracting movements and expressions.

Unacceptable:

- Student does not appear sufficiently prepared.

- Student rarely makes eye contact and reads from notes the majority of the time.

- Student has extensive distracting movements and expressions.

- Student does not speak for 8 to 10 minutes.

Organization

High Quality:

- Organization of presentation significantly enhances understanding.

Acceptable:

- The presentation is organized.

- Introduction gives an overview of the content.

- There is a clear beginning, middle, and end of the speech.

- The conclusion summarizes the main points.

Unacceptable:

- Introduction does not give an overview of the presentation.

- Order and progression of ideas creates confusion.

- Transition from one part of the speech to the next is unclear.

- There is not an obvious conclusion and the presentation ends abruptly.

Content

High Quality:

- Student makes insightful connections to personal experience, observation, and reading.

- Student chooses exceptional details in supporting main points.

- The use of visual aids or demonstrations significantly enhances the presentation.

Acceptable:

- Main points are supported with appropriate information and details.

- Student makes relevant connections to personal experience, observation, and reading.

- Incorporation of visual aids supports presentation.

Unacceptable:

- Student does not develop or support his or her ideas with sufficient information and details.

- Student fails to make relevant connections to personal experience, observation, and reading.

- Quality of or reliance on visual aids sufficiently detracts from the quality of the speech.

- No tangible product is used.

[1] See Grubb and Lazerson (1974) for a history of vocational education and a discussion of the negative stigma that has plagued vocational education since its inception.

[2] The authors feel it important to mention the overall intention of this study--to present examples of school-to-work efforts that are working to promote the integration of all students. In doing so, the authors attempt to provide enough supporting documentation in the form of contact names and phone numbers to allow further investigation and gathering of empirical data if readers are so inclined. To the extent possible, the authors used supporting documentation but were cognizant of the lack of such information.

[3] Over the past decade, industry leaders have spent time and money creating industry-based skill standards that support high-performance workplace principles. Similarly, educators at state and national levels have focused many of their efforts on developing or updating academic standards to prepare students better for the new demands of work and life. In 1997, the IEE hosted workshops that brought together representatives from several of these national academic and industry groups. The workshop was structured so that participants could discuss the difficulties of developing integrated standards and determine the next steps to promote integration. A 1998 conference focused on the integration of mathematics standards in three industries. See Bailey (1997) and Forman and Steen (1999).

[4] See Bailey and Merritt (1995) for a discussion of the changes in skill standards and an evaluation of the 22 industry-based skill standards projects funded by the U.S. Departments of Education and Labor. This report indicates that, although a long way from producing standards that fully integrate academic and technical skills, industry groups are working toward standards that reflect workplace dynamics and an increased importance on academic and technical skills. See also Bailey (1997) for a discussion of the similarities and differences between academic and industry skill standards.

[5] The following organizations have also endorsed the use of basic and high standards in schools throughout the state: Minnesota Business Partnership, Minnesota Chamber of Commerce, Greater Minneapolis Chamber of Commerce, St. Paul AreaChamber of Commerce, Minnesota Association of Colleges of Teacher Education, Minnesota Employers' Association, Minnesota High Technology Council, Printing Industry of Minnesota, Inc., Minnesota Association of Private Postsecondary Schools, Minnesota Retail Merchants Association, SciMath Minnesota, Minnesota State Arts Board, and Minnesota Technology Education Association (children.state.mn.us/grad/Gssupp.html).

[6] Performance packages are a series of rigorous assignments that, taken together, indicate whether a student has learned the skills and knowledge specified in an entire content standard.

[7] See Appendix 4 for a condensed list of Maryland's "skills for success"--the state's crossdisciplinary standards. Maryland's "skills for success" are similar to SCANS skills published by

the U.S. Department of Labor in the early 1990s.

[8] The state's new road map for schools includes three components: (1) setting clear, high expectations for all students, and developing an effective means of assessing students' progress in meeting the standards; (2) building the local capacity of schools to enable all students to meet standards; and (3) making public the results of the assessment of student progress through school reports.

[9] North Carolina schools are graded based upon test scores and the percentage of students enrolled in college Tech Prep and college prep programs--no points are awarded to schools with students in a general education course of study.

[10] An eighth-grade "end of grade" assessment is used as a competency measure that must be passed for students to enter high school. A high school accountability model was implemented during the 1997-1998 school year; a core mastery exam will be created for the 1998-1999 school year; and an exit exam will be ready for the year 2001. Student promotion benchmarks, including a performance assessment, may be implemented by the year 2000.

[11] The ABCs are a comprehensive plan to reorganize the public schools in North Carolina that (1) stress strong accountability, (2) emphasize the basics and high educational standards, and (3) allow for maximum local control. The State Board of Education established the ABCs of Public Education plan based on the beliefs "that schools should be held accountable to high standards; that all children graduating from NC's schools should have a solid grasp of reading, mathematics, writing and technology skills; and that local communities and educators should be empowered to make vital decisions about schools" (www.dpi.state.nc.us/edreform/edreformplan.html, p. 4).

[12] The comprehensive strategy for reorganizing North Carolina's public schools was based on input provided by individuals at all levels in the community and state, including the State Board of Education, the Governor, the General Assembly, the North Carolina Education Standards and Accountability Commission, the Commission on Workforce Preparedness, the School-Based Management Task Force, parents, educators, and concerned citizens. Parents and employers voiced the need for a tangible connection between schooling and the real world. Employers and colleges wanted graduates of North Carolina's public schools to be able to apply lessons they have learned, and to be prepared to continue to learn as adults" (www.dpi.state.nc.us/edreform/edreformplan.html, p. 3).

[13] Under the NHEIAP, New Hampshire has developed a five step program for educational improvement: (1) define what students should know and be able to do at the completion of different levels of their education; (2) communicate these new standard to educators statewide; (3) assist schools in developing a local improvement and assessment plan; (4) develop assessment tools which accurately evaluate a student's ability to meet these new standards; and (5) assist schools in using assessment results to modify their local plan to improve student academic performance and achievement (webster.state.nh.us/doe/nheiap.htm).

[14] This year's 9th graders will be the first held accountable for achieving the state's new standards.

[15] The school has named this the "dean system for counseling" since teachers get assistance from the principal, administrators, and other counselors to enable them to more effectively become the student's "resource and crisis person." Counselors take up the slack and individually counsel students when they are in difficulty.

[16] The school, initially operating under a top-down policy, went through a solid change process that included a full strategic plan. The school board and key administrators began exploring school-to-work and structured the changes so that school-to-work reforms were systematically phased in--each school year a new cohort curriculum was designed and introduced. The school's reform started four years ago with the 9th grade class, the next year the school reform moved to the 10th grade, and so on.

[17] As the school-to-work consultant pointed out, "What we are going to do for one child, we will do for everyone." The school's special education students have the same graduation requirements as college-bound students; however, the staff will add support services for special education students.

[18] The original model for the school was the Tech Prep model that offered technical specialties for every student. The program expanded to offer 87 specialties but found this number unmanageable.

[19] The survey found that although postsecondary institutions do create partnerships that focus on assisting K-12 students and educators, the institutions do not see these partnerships as having much impact on the institutions' own programs and courses. Furthermore, they see their involvement in activities labeled "school-to-work" as "almost always limited to vocational and career education."

[20] A representative from the New York State Department of Education described the ESC program as unique in that various higher education institutions are becoming increasingly interested despite the lack of formal state mandates and state or national funding.

[21] The New York State plan is based on project models being piloted at four institutions: (1) City University of New York--LaGuardia Community College, (2) Rochester Institute of Technology, (3) State University of New York--Delhi, and (4) Syracuse University. These four institutions differ in size, assembly, and locality. Two of the four postsecondary institutions are four-year institutions--Rochester Institute of Technology and Syracuse University. Rochester Institute of Technology (RIT), a large, comprehensive university in upstate New York, is involved with the project through the Cooperative Education and Career Services Department. Syracuse University, a large, private, liberal arts and research institution with a large College of Arts and Sciences constituency, directs its efforts through the Office of Professional Development of the School of Education.

[22] These mini-grants, although sponsored by the university, are funded by the Maryland State Department of Education under a grant from the Carl D. Perkins Vocational Education Act, Title IIIE Tech Prep.

[23] Faculty worked with employers from pharmaceutical and biotechnology companies

using the DACUM process to define the skills, knowledge, and attributes that new employees need. The bioscience research program requires students to have workplace experiences in either academic or industry labs. Medical technology students are placed in health care facilities during their program (mdk16.usmd.edu/grant.html).

[24] The program specifies that internships are to be in research and development labs and not in manufacturing labs which are used primarily by two-year schools and Tech Prep programs.

[25] Northeastern's bachelor's degree in business administration is a five-year program in which students spend one year in the workplace before graduation.

[26] Specialized courses include Banking and Credit; College Accounting I and II; Computer Applications; Economics and the World of Finance; Financial Planning, International Economics, and Finance; Securities Operations; Strategies for Success; and External Collegiate Courses in Finance.

[27] In strand 1, teams develop integrated projects but concern themselves more with the process than the product of their efforts. The State Department of Education has published 45 projects so far which pair an academic discipline with a career cluster. In strand 2, individuals who have already completed strand 1 focus on aligning applied curriculum around broad themes.

[28] Many in Maryland feel that the state is constantly fighting the "for all students" battle with school-to-work. They have, however, come to realize that it is important to have more than just school-to-work reformers involved.

[29] The school's five career clusters are (1) Business and Information Technology, (2) Health and Consumer Science Technology, (3) Environmental and Agriscience Technology, (4) Construction Technology, and (5) Technology Productions.

[30] Students can earn up to $5 per class and up to $35 per school day. They do not earn actual money but rather accumulate checkbook balances that are adjusted in the school's computer system.

[31] This information refers to a Syracuse University internal document entitled, *New York State ECS Plan: Models and Strategies for Connecting Learning to Work in Postsecondary Education*, June 1998.

[32] To do this, the New Visions coordinator submitted her curriculum to the home school for approval. In turn, consultants at the home school submitted the curriculum to the State Education Department and the honors designation was accepted.

[33] The CHOICES program is being used in several New Hampshire schools. In addition, Indiana County in Pennsylvania uses the software for 7th through 12th graders. The county has spent the last part of this year training all teachers and guidance counselors on how to use the software.

[34] Freshman students have been directed to write out their goals/plans over the year in a freshman technical writing course. The overall plan is to have every student (especially those enrolled

in liberal arts programs) graduate and maintain a portfolio so that they can effectively articulate and assess what they do and need to learn to do.

[35] Of the 20 units of total credit that the state requires, six credits can be elective. Under this scheme, Tech Prep students are still able to enroll in two elective classes. Each school has the authority to increase graduation requirements and required courses.

[36] Not necessarily considered as such by school faculty, the AIP appears to be an expanded version of Graduation Challenge. It requires students to work 350 hours during the school year (as opposed to 30 hours for Graduation Challenge) as well as register for an applied English course and a seminar class to discuss their workplace experiences.