

# Update

ON RESEARCH AND LEADERSHIP

Office of Community College Research and Leadership

University of Illinois at Urbana-Champaign

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## To our readers

As we begin our fourth year of publishing *Update*, you will notice a new direction in the content of the newsletter. In response to the survey we sent you last spring, we will be bringing you in-depth information in the areas of interest you expressed. In future issues we plan to cover topics such as retrenchment, part-time faculty, diversity, tenure, emphasis on teaching and learning, and more. This issue combines two separate but interestingly similar topics you asked to hear more about—Tech Prep and Total Quality Management.

Your input continues to be valuable as we try this new approach to bringing you some of the latest research pertaining to community colleges. Send your comments or requests for additional copies to the address below:

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## Who we are

The Office of Community College Research and Leadership was established in 1989 at the University of Illinois at Urbana-Champaign (UIUC). *Our mission is to provide research, leadership, and service to community college leaders and assist in improving the quality of vocational-technical education in the Illinois community college system.* The Office is supported by the Illinois State Board of Education, Department of Adult, Vocational and Technical Education with funding from the Carl D. Perkins Vocational and Applied Technology Education Act of 1990.

# Tech Prep: Planning a Quality Initiative

Catherine L. Kirby

## INTRODUCTION

The Carl D. Perkins Vocational and Applied Technology Education Act Amendments of 1990 provided a framework for the innovative educational reform initiative known as Tech Prep (Technical Preparation). This legislation increased federal assistance for vocational education for another five years, from July 1, 1991 to June 30, 1996. The purpose of the new legislation has focused on a single economic mission: "to make the United States more competitive in the world economy by developing more fully the academic and occupational skills of all segments of the population."

Graduates of Tech Prep initiatives are expected to become preferred employees in tomorrow's demanding technical workplace. Beginning in the 11th grade, a sequence of integrated academic and technical coursework is articulated with postsecondary requirements resulting in a two-year associate degree or certificate.

Tech Prep is intended to prepare a workforce for the United States that is not only competitive with world class standards, but second to none. Harnessing the process of educating tomorrow's workforce to meet world class standards is an enormous challenge to educators and employers. A potential approach to accomplishing this new goal is adopting quality management principles.

Total quality management (TQM), quality assurance, total quality control, quality improvement, or simply quality are all terms that reflect contemporary business management practices. A simple definition of TQM is "the unyielding and continually improving effort by everyone in an organization to understand, meet and exceed the expectations of customers" (Procter & Gamble, 1989, p. 1).

A quality managed organization represents a departure from traditional management. The changes are

seen in areas such as employee empowerment, focus on customers, reliance on statistical measures of improvement, and emphasis on employee training and lifelong education.

The success of any new educational initiative such as Tech Prep depends on the design and maintenance of interactions between educational systems, businesses, and the processes within and between those institutions. While the business community has led the way in applying the quality approach, they do not hold the patent on the process. Tech Prep may represent one introductory pathway to implementation of quality strategies in education.

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Tech Prep does not equal TQM; they are parallel reforms. Each has unique goals and it is my belief that we can learn how to implement each better by initiating them concurrently.

This brief is designed to introduce key concepts of quality management and explore the parallels with Tech Prep. The goal is to communicate potential approaches to implementation of a successful Tech Prep program.

## QUALITY IN EDUCATION

While educators traditionally do not think of their schools as businesses, nor their students as customers, there is a correlation between providing a service as educators do and producing a product as manufacturers do. The end product in both situations is achieved as a result of complex processes involving people. It is the act of managing these complicated human processes that is the focus of quality management.

The quality movement in higher education is growing (Brandt, 1992). Many community colleges and universities are beginning to apply quality principles to administrative structure and management and some are offering certificates and degrees in quality management (Coate, 1990; Spanbauer, 1992). Although slower to embrace TQM, many secondary institutions are implementing practices that parallel quality principles such as "participatory management, shared decision-making, site-based management, and outcomes-based education" (Axland, 1991, p. 62). Many businesses are assisting education in this effort. They are sharing their views about the educational needs of the workforce as well as their experience with applying quality processes to achieve improvement. Motorola, 1988 winner of the Malcom Baldrige National Quality Award, with headquarters in Illinois has taken a leadership position in sharing the corporate experience in adopting quality principles.

## QUALITY THEORISTS

Familiarizing oneself with quality theorists can help us understand how theories, terminology, and methods apply to educational settings. There are many quality theorists. I have chosen probably the three most renowned but would encourage readers to research others for the parallels to Tech Prep.

While differing in approaches, W. Edwards Deming, Joseph M. Juran, and Philip B. Crosby are united in their emphasis on education to achieve the elusive standard of quality.

### W. Edwards Deming

Deming, a statistician, went to Japan following WWII to conduct a census and assess the needs of the country (Aguayo, 1990; Gabor, 1990). Deming taught the Japanese the importance of market research, the need to control variation in all processes, and the importance

### Deming's Fourteen Points

Point	Concept
1	Create consistency of purpose for improvement of product and service.
2	Adopt the new philosophy.
3	Cease dependence on mass inspection.
4	End the practice of awarding business on the price tag alone.
5	Improve constantly and forever the system of production and service.
6	Institute training.
7	Institute leadership.
8	Drive out fear.
9	Break down barriers between staff areas.
10	Eliminate slogans, exhortations, and targets that ask for new levels of productivity without providing specific improvement methods.
11	Eliminate numerical quotas. Substitute leadership.
12	Remove all barriers to pride in workmanship.
13	Institute a vigorous program of education and retraining.
14	Put everybody to work to accomplish the transformation.

of working closely with suppliers. Japan's application of Deming's teachings has resulted in the dramatic shift in the meaning of "made in Japan." Today, American consumers recognize many Japanese manufactured goods as having world-class quality.

Believing that quality is controlled by the elimination of inconsistencies in the delicate interaction of people, machines, materials, and the environment, Deming developed a system based on fourteen points (see previous page).

Thirty years after he began work with the Japanese, an American company, Ford, asked Deming for help. Ford took Deming's philosophy seriously and made a commitment to quality, as is evident in its slogan, "Quality is Job One." Management restructured the organization, focused on customer needs, empowered its engineers and line workers with decision making, and as a result created an award-winning model, the Taurus.

Today, Deming continues to conduct seminars and teleconferences for business managers, educators, and administrators interested in pursuing quality at their institutions.

### Joseph Juran

Juran's contributions to quality also began in the 1950s and were sought by Japanese scientists and engineers. Juran's (1989) definition of quality is "fitness for use" and has two major components: (a) A product must have features that meet customer needs and (b) the product must be free from deficiencies.

Another important tenet of Juran's quality vision is that every product or service has: (a) internal customers, those who are affected by the product and are members of the company that produce the product;

and (b) external customers, those who are affected by the product but are not members of the company.

Juran advocates a process for managing quality that has come to be known as The Juran Trilogy® (see below). Steps involved in all three stages are systematic, focus on customer needs, and result in raising performance to breakthrough levels.

Juran comments on how Americans failed to notice the trend of improving Japanese quality and wrongly believed that increasing competition from Japanese products was due to pricing. By the 1980s it was evident that quality, not price, was the commodity many Americans were willing to pay for.

### Philip Crosby

Credited with advocating a more top-down approach than Deming and Juran, Crosby is recognized here as a third leading quality "guru". Based on his extensive experience beginning as a line inspector for IIT and advancing to vice president for worldwide quality operations, he has established the following four absolutes of quality management:

1. Quality is conformance to requirements.
2. The system of quality is prevention.
3. The performance standard is zero defects.
4. The measurement of quality is the price of non-conformance (Crosby, 1985).

Cost of quality is a favorite Crosby theme. The title of a 1979 publication, *Quality is Free*, has a deeper meaning than the title might first suggest. While Crosby recognizes that any quality management effort consumes resources from many areas, he contends that these quality efforts more than pay for themselves in the long run.

### The Juran Trilogy®

Managerial processes	Activities
Quality planning	Developing products and services to meet customer needs
Quality control	Evaluating performance against quality goals and closing gaps
Quality improvement	Raising performance to higher levels

## THE PARALLELS BETWEEN IMPLEMENTING QUALITY AND TECH PREP

Preparing students for work that changes as rapidly as technology dictates requires that the educational process embrace change. Students must be taught to anticipate, encourage, and manage change on a daily basis (Secretary's Commission on Achieving Necessary Skills, 1991). Businesses must change as well, offering workplaces which encourage a thinking workforce, one eager to provide input in decision making.

Planning for change requires extensive participation by customers (Juran, 1989). Customers of Tech Prep education include those internal (e.g., educators, parents, students) and external (e.g., employers, labor, taxpayers) to the process. Communication between various customer groups exposes ideas, identifies problems, and sets the stage for solutions.

Breaking down barriers between secondary and postsecondary education and business is a prerequisite to teamwork and increased interpersonal skills, which have been identified as keys to improving productivity (SCANS, 1991; Weisman, 1993). Keeping the intent of the legislation at the forefront of Tech Prep planning processes provides both internal and external customers with common goals to work toward.

Businesses frequently report that one or another quality approach is not satisfactory, so they blend ideas from several theorists to create one that best suits their

company's situation. When selecting an approach to quality management, each consortium should consider such factors as organizational structure, decision-making procedures, and the history of implementation of change. By putting quality first, each consortium can select the theorists and approaches most applicable to local needs.

Juran's approach to strategic quality management was chosen by Kirby and Bragg (1992) because of his emphasis on the leadership role. We believe that, when applied to the implementation of Tech Prep, a roadmap to achieving a quality Tech Prep initiative can be created.

### A Potential Formula for Tech Prep Implementation

Guiding principles provide the basis for the development of any quality system. The table below shows how principles of quality management can be used to develop principles to guide Tech Prep. A closer look at each of Juran's prerequisites provides Tech Prep leaders with a potential formula for implementing the innovation that is the promise of the Perkins legislation: Tech Prep. While this discussion cannot possibly contain all the answers, we think it is a good place to begin.

#### 1. Provide Leadership from the Executive Staff

A thorough understanding of Tech Prep and the leadership techniques of quality managed organizations

TQM Principles	Tech Prep Principles
Customer needs drive quality improvement.	Student needs drive Tech Prep.
End-to-end processes are the focus of quality improvement.	Articulation, integration, and collaboration are end-to-end processes key to Tech Prep.
Everyone manages a process specific to his/her work.	All educators manage a process related to Tech Prep.
Planning ensures high quality products and services.	Planning ensures high quality outcomes for Tech Prep.
Valid measures are the basis for continuous improvement of work processes, products, and services.	Valid measures are the basis for continuous improvement of all aspects of Tech Prep.
Leadership development for <i>all</i> is essential to making TQM work.	Leadership development for <i>all</i> is essential to making Tech Prep work.
Quality improvement never ends.	Quality improvement never ends.

provides a formula for preparing Tech Prep leaders. Coordinating input from business, industry, secondary and postsecondary educators, and academic and vocational educators requires organizational and leadership skills. These skills can be acquired and enhanced through staff development activities at the local, state and national levels.

While the word "leadership" has no single set of descriptions for every situation it does imply attributes that set it aside from management or supervision. Kouzes and Posner (1990) state that the distinction lies between "getting others to do and getting others to want to do" (p. 27).

Many leadership responsibilities are described in TQM literature including knowing the work being supervised, enabling others to reach their potential, eliminating fear, and treating all members of the organization fairly. Effective leadership is crucial to the success of Tech Prep. Care must be taken to develop and involve leaders at each level of educational delivery so that the investment of human resources is not wasted.

## 2. Establish a Vision

Perkins II was deliberately written to allow the states flexibility to tailor Tech Prep to meet local needs. This lack of a blanket prescription demands vision during planning and implementation. Establishing a vision is essential if Tech Prep is to be the blueprint for taking education where it has never been before. The vision statement for Tech Prep can evolve from the following three simple questions which reflect TQM's emphasis on anticipating customer needs:

1. What is the future we seek for our students?
2. Why is that future important?
3. How will we behave to carry out that future?

Developing a vision statement that reflects each participant's perspective means employing teamwork, reaching consensus, and providing direction for each member of the initiative.

Once a vision for Tech Prep is adopted, it is important for each institution in a consortium to examine its policies to ensure their congruence with the vision. As Tech Prep develops over time, the vision should be renewed to reflect the continuous improvement demanded of a competitive workforce.

## 3. Establish Broad Quality Goals

Sharing the vision with people involved at every level of an organization is the initial step in establishing broad quality goals. A great leader with a brilliant vision is ineffective if the vision is not, first, adopted by others in the organization and, second, translated into goals and implemented.

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Tech Prep goals are unique to local consortia but take their direction from the Perkins II legislation. Organizations committed to managing TQM have unique institutional goals as well, yet they take their direction from quality principles.

The first column in the table on the following page lists three quality goals. The second column shows that the goals, when applied to Tech Prep, parallel the intent of the Perkins legislation.

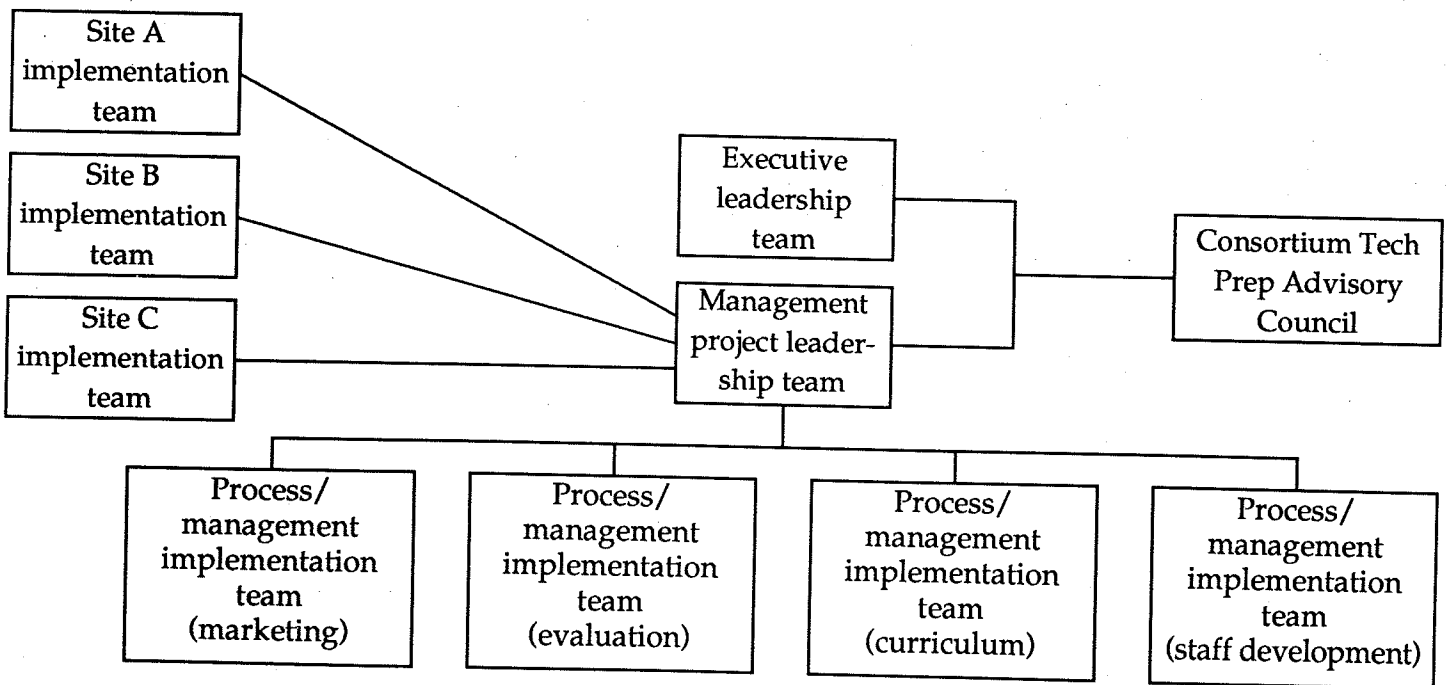
## 4. Deploy Quality Goals to All Levels of the Organization

Leaders enable others to act. They must have a plan for establishing and implementing goals that involves everyone in the process. This is most efficiently accomplished by organizing various teams. Deploying goals to teams at all levels of an organization establishes empowerment, which leads to increased productivity (Fortune, 1993; Juran, 1989; Deming, 1986).

Quality Goal	Intent of Perkins Legislation
Improve customer service	Meet the needs of students enrolled in Tech Prep by providing work-relevant education offered at convenient times and locations.
Reduce failures, errors, and time cycles	<ul style="list-style-type: none"> <li>• Establish dropout prevention and recovery programs.</li> <li>• Integrate vocational and academic content.</li> <li>• Eliminate duplication by establishing core courses that facilitate articulation between programs and institutions.</li> </ul>
Reduce costs associated with poor quality	Reduce the cost of education by <ul style="list-style-type: none"> <li>• sharing resources among educational systems and businesses, and</li> <li>• employing teams in teaching, learning, and managing education.</li> </ul>

The use of four types of teams provides the backbone for curriculum integration, articulation, collaboration, and evaluation efforts. Those teams include executive, project management, process management/implementation and site-based implementation teams. Some variation of the following organizational structure has been effectively practiced by many consortia as a way to deploy goals for Tech Prep (see below).

The communication necessary within and between teams requires allocation of a valuable commodity—time. Grant funds must be used to provide release time or hire substitute teachers so that staff can be actively involved in planning and implementing the goals of each Tech Prep initiative.



## 5. Provide Needed Resources, Including Training

In business, training is needed when a worker is faced with a new task or machine. Tech Prep is a new machine for the educational process. The resources needed to fully utilize it fall largely in the staff development area and this is recognized by requirements in Perkins II for joint training of faculty and counselors of secondary and postsecondary institutions.

Training is viewed as an essential component of the culture of organizations committed to continuous quality improvement. Regardless of where it begins, all participants must eventually receive training. The focus of this training is on the principles of how to implement quality improvement in all facets of work processes.

Research on educational change reinforces the importance of a vital staff development component to any new educational program (Fullan, 1992; Fullan, Rolheiser-Bennett and Bennett, 1990; Little, 1990a; Little, 1990b; Stallings, 1989). Some important lessons about how to design staff development for Tech Prep follow:

1. Take the pulse of the organization and examine the culture for collegiality as a first step in designing staff development (Fullan, 1992).
2. Link staff development directly to educational change so lasting improvements can occur. Ensure everyone has responsibility for it (Little, 1990a).
3. Learn by doing. It is crucial to both staff development and successful implementation of a new program (Stallings, 1989).
4. Design a structure for coaching and mentoring. Involve teachers as learners (Little, 1990b).

## 6. Establish Measures

Any quality initiative is a highly data-driven effort. The practice of establishing measures of performance and the goals of quality improvement are inextricably

intertwined. If we cannot measure results or understand what is measured, we cannot identify or control the process of improvement (Ackerman, Coleman, Leger, & McDorman, 1989). Jack Welch, CEO of General Electric, emphasizes the importance of simplicity in measurement, cautioning, "Too often we measure everything and understand nothing" (*Fortune*, 1993).

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*Grant funds must be used to provide release time or hire substitute teachers so that staff can be actively involved in planning and implementing the goals of each Tech Prep initiative.*

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The practice of defining measures also forces the establishment of priorities. Time prohibits us from measuring everything, so we must be selective in choosing processes that have the most impact on affecting the quality of goods or services provided.

In September 1992, a fifty-state survey was conducted to determine the status of Tech Prep planning and implementation (Layton and Bragg, 1992). Respondents to the study were the designated state Tech Prep leaders. On the subject of evaluation, nineteen states were far enough along in planning and implementation to have established outcomes. The results of that survey appear on the following page.

According to recommendations made at the Tech Prep Leadership Summit held in June, 1992, appropriate measures (a) reflect both formative and summative outcomes, (b) involve all parties in the consortia in accountability, (c) determine the effectiveness of the implementation process, and (d) reflect the broader purpose of Tech Prep. The evaluation goals clearly go beyond those typically established for vocational education, positioning Tech Prep as the vehicle to carry workforce preparation into the globally competitive twenty-first century.



## 7. Review Performance Regularly

Quality management is committed to continuous improvement. In order to ensure those efforts continue in the desired direction periodic performance reviews are necessary. To be effective, performance review must be relevant, accurate, timely, specific, and easy to understand.

Tech Prep is a highly interactive educational delivery system. By using teams to support and reinforce the entire initiative, an effective mechanism for accurate review and constructive feedback can be formed. The collective expertise provided by teams, establishment of clear measures, and an environment that encourages input without fear of negative consequences facilitates the communication necessary to make performance review meaningful.

## 8. Develop Effective Reward Systems

Celebrating the achievements of individuals and teams marks the final strategy of applying Juran's principles to Tech Prep implementation. The practice of rewarding performance is less common in education than it is in the business world. However, everyone appreciates being recognized for a job well done. A quality

managed initiative rewards performance that is consistent with the goals of Tech Prep. Opportunities to obtain advanced training, attend professional meetings, or receive public recognition are examples of rewards that promote personal growth and satisfaction as well as promote Tech Prep.

Effective reward systems include a variety of methods that differ in frequency, cost, and complexity. Whatever rewards are used, criteria for achieving them should be clearly stated, available to all, and meaningful to the recipients. The challenges educators face in future years will certainly increase in complexity. Therefore, it is not too soon to begin the quality improvement process and help ensure its success with effective reward systems.

## CHALLENGES IN IMPLEMENTING TECH PREP

The era when educators had to answer only to the local, often isolated businesses and communities no longer exists. We now prepare workers who are employed in businesses that increasingly compete globally for market share. Quality goods at the lowest

### Percentage of 50 States by Outcome

Outcome	States (%)
Improved academic skills (e.g., communications, mathematics, science)	100
Improved secondary program completion rate	100
Improved job placement rate	90
Improved technical skills	84
Improved postsecondary program completion rate	79
Increased career awareness	79
Increased employer satisfaction	74
Improved problem-solving and critical thinking skills	63
Improved attitudes toward or perceptions of technical careers	42
Improved student self-esteem	37

Note: N = 19

cost possible requires higher levels of productivity each year. Welch has stated that increased productivity is achieved "by working smarter and seeing your role in the total process" (*Fortune*, 1993, p. 92).

The Secretary's Commission on Necessary Skills (SCANS, 1991) reminds us of a finding of cognitive science research: the best way to teach desired skills is within the context of the environment in which they are performed. Teamwork, improved communication, and interpersonal skills are cited in the SCANS report as "necessary" and are highly valued in any quality managed institution. If they are to become a permanent fixture in the workplace, they must be practiced by both students and teachers within schools.

Although largely outside the sphere of influence of education, business must change to provide work environments that allow employees to use the skills developed in Tech Prep. By its own admission, U.S. business "has been slow to do its part" (Weisman, 1993, p. 369).

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Tech Prep will succeed if its many stakeholders plan for and manage the changes occurring in our collective environments. Developing strategies that address resistance to change—an inevitable occurrence with an initiative as dramatic as Tech Prep—is the responsibility of leadership.

Kouzes and Posner, authors of *The Leadership Challenge* (1990) offer three important lessons that directly apply to leadership of Tech Prep implementation.

1. People who become leaders do not always seek the challenges they face. Challenges also seek leaders.
2. Opportunities to challenge the status quo and introduce change open the doors to doing one's best. Challenge is the motivating environment for excellence.
3. Challenging opportunities often bring forth skills and abilities that people do not know they have. Given the opportunity and the support, ordinary managers can get extraordinary things done in organizations (Kouzes & Posner, 1990, p. 39).

The goal of improving quality is at the heart of Tech Prep and quality management. Each reform requires comprehensive change in the process with which education and business is conducted. Each advocates continuous quality improvement through strong democratic leadership. Each contributes to building America's workforce and increasing the country's economic competitiveness.

Combining Tech Prep and Juran's strategic quality management approach can create a synergistic effect. The result is an enlightened educational environment where students can realize their potential. The challenge is before us. The solution is our responsibility.

For further information see *Implementing Tech Prep: A Guide to Planning a Quality Initiative*. This book also includes information on educational reform, an historical perspective for Tech Prep, and methods of using group process tools and teamwork to implement Tech Prep. It is available from NCRVE Materials Distribution Service, 1-800-637-7652.

For additional copies of this brief, please contact the Office of Community College Research and Leadership at The University of Illinois, Department of Vocational and Technical Education, Room 344 Education Building, 1310 South Sixth Street, Champaign, IL 61820, or call 1-217-333-0807.

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