Re-engineering CTE in Iowa

Aligning Career and Technical Education with Education Reform, Workforce Development and Economic Development

Report to the Iowa Department of Education

Prepared by the Meeder Consulting Group, LLC
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Executive Summary

Career and Technical Education in Iowa is a critical and valuable asset for improving the competitiveness of Iowa's workforce.

Career and Technical Education (CTE) is becoming widely recognized for its strengths in –

- building student engagement and real-world connections,
- helping high schools become more relevant and meaningful,
- increasing student graduation from high school,
- supporting students in making seamless transitions into postsecondary education and training, and
- supporting the up-skilling and retraining of adults already in the workforce.

To fulfill its potential, Iowa leaders need to apply a thoughtful redesign plan and allot adequate financial resources to CTE. This will allow CTE in Iowa to fully emerge as a strategy to address the complex learning needs of students and workers in the 21st Century.

The Challenge and Opportunity of Workforce Quality

Already well into the first decade of the 21st century, Iowa possesses rich resources in its people, communities and natural endowments. It will need to maximize these resources as it faces serious challenges in building for future success.

Iowa is a relatively small state and is on the rebound economically. It has an overall population that is stable, but which is shifting within the state from more rural areas to suburban and urban centers. There is a very tight labor market with high levels of employment. Iowa now has a time-sensitive opportunity to exert global leadership in renewable energy, while maintaining its leadership in other key industries like finance and agriculture.

In its 2006 call for action, "The Iowa Workforce Challenge," the Iowa Works campaign laid out the threat in stark terms: "The danger confronting Iowa is unsettlingly clear. Unless policymakers respond to this workforce crisis in a dramatic fashion…businesses that are based in this state, or looking to site here**,** will be unable to hire sufficiently qualified workers to grow and compete."

This challenge arises from several factors, including: slow population growth; significant population shifts within the state from more rural to more suburban areas; an aging workforce; declining enrollment in the state's k-12 education system; too few adults pursuing postsecondary education and training; and a projected skilled workforce shortage of 150,000 by 2012.

The risks of non-action are clear; the good news is that action to strengthen Iowa's workforce quality will yield economic benefits to individuals and the state's economy.

While Iowa has a tradition of "local leadership" in education matters, educators and leaders are open to statewide coordination and collaboration when it is clear these activities contribute to better educational outcomes for Iowa's children, youths and workers.

This swirl of challenges and opportunities provides a clarion call for focused and sustained leadership in developing and strengthening a quality workforce.

The Changing Face of Career and Technical Education

In its 2006 report on "Reinventing the American High School for the 21st Century," the Association for Career and Technical Education said that "given the magnitude of the CTE enterprise, it is vital that CTE educators and leaders be active participants in discussions about how to redesign American high schools for the needs of the 21st Century. CTE must bring its resources and expertise to the table." [1]

As the rigor and readiness agenda has risen to the forefront of attention, education leaders realize that traditional educational methods are not likely to succeed in keeping students engaged in high level learning needed in the 21st century.

Important opportunities lies in the emergence of programs that blend CTE with math and science, such as through the Project Lead the Way pre-engineering program, Project Lead the Way's new biomedical science program, and the forthcoming Curriculum for Agricultural Sciences Education (CASE) that is being developed by the National Council for Agricultural Education.

Much has changed for good over recent years and Career and Technical Education is becoming a much different enterprise than in the past. Reforms since 1990 have created strong connections between CTE high school courses and CTE courses offered at community colleges, including extensive agreements for sequenced courses (known as articulation agreements) and also the ability of high school students to enroll in and earn postsecondary credits. These inter-system policies allow students to earn college-level credit as high school students, and often be awarded high school credit as well.

In Iowa, the Department of Education Division of Community Colleges and Workforce Preparation has direct jurisdiction over CTE at both the high school and community college levels. Among the states, this is a relatively unusual arrangement and affords Iowa the opportunity to create one of the most seamless high school-to-community college connections in the nation.

The Perkins Act of 2006

The new Perkins Act (referred to in this report as "Perkins IV") reflects Congressional priorities and maintains a federal funding stream designated solely for Career and Technical Education programs. The law builds upon and strengthens the existing accountability system and creates new programs to ease the transition of students from secondary into postsecondary education programs.

There are four significant changes to the new law that will have an impact on state and local recipients of Perkins funds: CTE Programs of Study, Accountability, Tech Prep, and Competitiveness. This report provides an overview of those key changes in the law and a review of implications for state action.

Strategic Objectives for Re-Engineering CTE in Iowa

The following Strategic Objectives are recommended with specific strategies and action steps. In the whole, they will:

- Increase the number of Iowans who make successful transitions into and through college CTE programs, leading to high-skill and high-wage employment;
- Create a world-class CTE system in Iowa;
- Integrate CTE with Iowa's high school improvement agenda;
- Connect Iowa CTE to the State's competitiveness agenda; and
- Build the quality and supply of Iowa's CTE teachers.

Strategic Objective 1: Increase the number of Iowans who make successful transitions into and through college CTE programs, leading to high-skill and high-wage employment.

Participation in and completion of college, at both the associate's degree and bachelor's degree levels, is a key driver of Iowa's competitive economic position. It also pays important economic dividends to the individual who partakes of college-level work.

CTE programs of study, called "Career Academies" in Iowa, offer the most tangible strategy to attract more Iowan youths into and through college. In Career Academy programs, students see the immediate relevance of their classes to their personal career interests, and better understand how academic and CTE courses connect to those interests.

For adults too, high-quality CTE programs offered through Iowa's community colleges provide the opportunity to grow and advance within a career field, or to enter a new field entirely.

At least four high-quality Career Academy programs should be available to every Iowa youth by 2010, supported by the development of model Career Academy Plans of Study, effective regional coordination among school districts and colleges and the Regents universities, and the emergence of strong school-based guidance and advisement systems.

The following strategies will help achieve Strategic Objective 1:

Strategy 1.1 Promote access to high-quality Career Academies for all Iowan youths.

Strategy 1.2 Create model Career Academy Plans of Study that help students make seamless transitions between high school and postsecondary studies.

Strategy 1.3 Reorganize Tech Prep activities so they are closely coordinated with Career Clusters/Pathways and Career Academy development.

Strategy 1.4 Improve and extend guidance and counseling.

Strategy 1.5 Collaboratively develop model placement standards for community college CTE courses.

Strategic Objective 2: Create a World-Class Model CTE Curriculum

Over several decades, Iowa has accumulated a variety of organizational structures relating to Career and Technical Education, some of which reflect a traditional model of CTE. The state is ready for a significant updating of its CTE structure, policies and regulations that will allow these programs to be more easily integrated and coordinated with high school reform, workforce development and economic development. In concert with a new structure built around "career clusters," Iowa's CTE curriculum should be updated to reflect current expectations for college and work-readiness, closely integrating the CTE curriculum standards with Iowa's model content standards for academic performance, and creating model Career Academy plans of study.

The following strategies will help achieve Strategic Objective 2:

Strategy 2.1 Adopt the Career Clusters model and connect to targeted industry clusters.

Strategy 2.2 Revise and validate all CTE content standards around current industry standards.

Strategy 2.3 Update related Iowa code and regulations and provide more flexibility in their application.

Strategy 2.4 Align services for promising practices in serving special populations.

Strategic Objective 3: Connect CTE to the High School Improvement Agenda

For the past three years, Iowans have engaged in an intensifying dialogue between state policymakers and local educators about how to best position Iowa's high schools for the future. CTE should be viewed by education leaders at the state and local levels as an integral strategy for bringing rigor, relevance, and relationships to the high school experience for Iowa's youths. This involves recognizing CTE in the state's rigor/relevance framework, and strengthening CTE services to help students with educational challenges to be more successful.

The following strategies will help achieve Strategic Objective 3:

Strategy 3.1 Closely coordinate efforts of academic/CTE integration with the Iowa Model Core Curriculum.

Strategy 3.2 Position CTE as a "stretch learning" opportunity within the Iowa High School Project's Rigor/Relevance Framework.

Strategic Objective 4: Link CTE to the Competitiveness Agenda

It is clear from a variety of perspectives – the Department of Education's emphasis on high school reform and community college excellence, the governor's proposals on renewable energy, and the Iowa Works campaign – that Iowans are focused and serious about improving their education system in a way that builds a high-quality workforce to ensure Iowa's economic future.

Iowa leaders should explicitly connect its redesign of CTE with the state's competitiveness agenda. This requires promoting and funding high-quality model programs in engineering and other technical fields, and coordinating and streamlining state and local business engagement activities among state and local agencies.

The following strategies will help achieve Strategic Objective 4:

Strategy 4.1 Link to the competitiveness agenda by promoting national model programs in engineering and science.

Strategy 4.2 Strengthen regional planning by establishing workforce/business and industry advisory boards that jointly advise K-12 CTE, community colleges, workforce development, and economic development.

Strategy 4.3 Require more intensive coordination of high school and community college programs around workforce needs.

Strategic Objective 5: Build the Quality and Supply of CTE Teachers

For current CTE teachers, there is the ongoing challenge of reaching and maintaining high levels of teaching – by staying fresh in their knowledge about the field in which they teach, and applying research-based instructional practices that help the maximum number of students find success. There is also a need to find new ways of attracting more youths and adult professionals into CTE teaching, and also a need to create strategies to help current teachers make a transition into CTE instruction with as few barriers as possible. Iowa's education and policy leaders should take action to address these priorities.

The following strategies will help achieve Strategic Objective 5:

Strategy 5.1 Increase collaboration for professional development among various CTE teacher groups.

Strategy 5.2 Examine professional development policies and funding for postsecondary faculty.

Strategy 5.3 Provide creative approaches to strengthen CTE teacher recruitment and retention.

The Opportunity for Reflection – And Action

Iowa's elected officials and education leaders at both the state and local levels need to reflect upon all the interrelated recommendations of this report, engage the relevant stakeholders in discussion and planning, and create a clearly articulated CTE redesign strategy that extends over the six-year period covered by the Perkins Act authorization.

Through strong state leadership and consistent local program improvement, Career and Technical Education in Iowa will be recognized as an integral part of the state's education, workforce and economic development strategies. CTE in Iowa will help prepare Iowa's high-quality workforce and sustain its U.S. and global competitiveness for decades to come.

Project Overview and Report Organization

In December 2006, the Iowa Department of Education launched a project to conduct a strategic review of the State's system of Career and Technical Education (CTE) delivered through school systems and community colleges. The Department of Education contracted with the services of Hans Meeder of the Meeder Consulting Group, LLC (Agreement #62207) to carry out the project.

The purpose of the project is:

> *To help education leaders in the State of Iowa articulate a clear vision and mission for the role of Career and Technical Education in various education settings.*

The vision (preferred end-state) for the project is:

> *Upon completion of this project, state education leaders within Iowa will be in a strong position to articulate the mission and vision of CTE for Iowa.*
>
> *State leaders will have a clear understanding of the quality and effectiveness of current CTE programs within the State of Iowa, and how those efforts compare with similar initiatives in other states.*
>
> *State leaders will have a firm understanding of areas that are strong and areas needing greater attention for quality improvement within CTE, and will be able to prepare their multi-year state plan under the Perkins Act of 2006 in light of these strengths and needs.*
>
> *The State will receive input from a number of local education leaders representing the perspectives of both secondary and postsecondary levels and will be able to rely on this input to plan future actions for program improvement.*

As part of this project, the Meeder Consulting Group conducted 24 information-gathering sessions with leaders from business and government, school administrators and school board officials, teachers, and college faculty throughout Iowa; and additional interviews with state government staff and officials. These sessions were held over seven days in December 2006 and January 2007 in Des Moines and at the following community colleges throughout Iowa: Kirkwood Community College in Cedar Rapids, Iowa Central Community College in Fort Dodge, Southwestern Community College in Creston, Iowa Western Community College in Council Bluffs, Des Moines Area Community College in Ankeny, and Eastern Iowa Community College District in Davenport. A summary of the findings from the information-gathering groups is found in Section I.

The purpose of these sessions and interviews was to gather unfiltered input on the quality of Career and Technical Education at the local delivery level, and to gather input about how the State might organize its resources and guidance to better support quality programs at the local level.

Following up on general insights and directions shared by the discussants, the contractor dug deeper into program data, state laws and regulations, and numerous studies and reports that have been issued over the last several years. These sources served to document the relevant data and policies that make up the education and workforce system in Iowa, and specifically shed light on how Career and Technical Education is delivered in the state. The focus of investigation was not only viewingCTE as a stand-alone

enterprise, but also assessing how the resources and activities in CTE intersect with and support other educational and economic development priorities of Iowa.

Part I of this report provides an overview of the current and future workforce challenges facing Iowa, and gives a summary of how CTE is currently delivered in Iowa and its relation to other key educational reforms and activities.

Part II of the report provides a summary of the more important federal requirements relating to Career and Technical Education, and reviews the options for state action in response to those broad requirements. As of 2007, the Iowa Department of Education has already created a one-year "transition plan" for implementation of the renewed federal legislation that provides funding and guidance for state accountability systems surrounding Career and Technical Education. The legislation, commonly known as Perkins IV, is the Carl D. Perkins Career and Technical Education Improvement Act of 2006, and will be in effect through 2012. In 2008, Iowa will submit a five-year plan that covers the remaining years of the program.

Part III of the report provides information on how CTE has been carried out in a number of other states under the rules of the previous Perkins law, which was still in effect when the research was conducted. The previous Perkins law was less directive than the new law; nonetheless, to varying degrees these states implemented innovative policies and programs that helped improve program quality, and have informed and modeled some of the key concepts included in the new Perkins Act. No state has a monopoly on "best practices," but these promising practices can provide food for thought about how Iowa can further refine and improve its work in CTE.

Finally, Part IV responds to themes and issues identified in the earlier parts and offers recommended strategic objectives, strategies, and action steps for redesigning CTE in Iowa. The recommendations in Part IV are meant to help Iowa fully integrate its vision for CTE with efforts at high school redesign, workforce development and economic development, so that Iowa will produce a highly-educated, skilled and competitive workforce.

Part I. Understanding Career and Technical Education in Iowa

Already well into the first decade of the 21st century, Iowa possesses rich resources in its people, communities and natural endowments. It will need to maximize these resources as it faces serious challenges in building for future success.

> "The danger confronting Iowa is unsettlingly clear. Unless policymakers respond to this workforce crisis in a dramatic fashion…businesses that are based in this state, or looking to site here***, will be unable to hire sufficiently qualified workers to grow and compete."***
>
> The Iowa Works Campaign

While sometimes overlooked, Career and Technical Education is quickly rising in visibility and perceived importance across the nation today, and Iowans are also re-examining the value of CTE.

This first section summarizes some of the key challenges facing Iowa.

Section IA. The Challenge and Opportunity of Workforce Quality

Iowa is a relatively small state and is on the rebound economically. It has an overall population that is stable, but which is shifting within the state from more rural areas to suburban and urban centers. There is a very tight labor market with high levels of employment. Iowa has a tradition of "local leadership" in education matters, but with a degree of collaboration and consistency required by the state. Iowa now has a time-sensitive opportunity to exert global leadership in renewable energy, while maintaining its leadership in other key industries like finance and agriculture.

This swirl of challenges and opportunities provides a clarion call for focused and sustained leadership in developing and strengthening a quality workforce.

In its 2006 call for action, "The Iowa Workforce Challenge," the Iowa Works campaign laid out the threat in stark terms: "The danger confronting Iowa is unsettlingly clear. Unless policymakers respond to this workforce crisis in a dramatic fashion…businesses that are based in this state, or looking to site here***, will be unable to hire sufficiently qualified workers to grow and compete."***

This challenge arises from several factors:

Population. Iowa ranked seventh lowest in the nation in growth of population from April 2002 to July 2005 at just 1.4 percent. In terms of net migration, Iowa experienced a negative domestic net migration rate of -3.0 from 2000 to 2004 with more people leaving the state than entering the state. [2]

Population Shifts in the State. 63 Iowa counties declined in population, with Pocahontas County showing the largest drop in population from 2000 to 2005 at -8.5 percent. Dallas County experienced the highest rate of growth with a double-digit increase in population from 2000 to 2005, increasing 27.0 percent.[3]

Aging Workforce. In terms of aging, Iowa was tied for being the state with the sixth lowest percentage of its population under five years old. Just 6.1 percent of Iowa's population was that young, while just one Midwest state (North Dakota) had a lower percentage of residents under 5 years old.[4]

Diversity. While the general minority population of Iowa is relatively small (8.4 percent vs. the U.S. average of 32.7 percent), the percentage of minorities in K-12 education is growing rapidly. Among its school-aged population, about 13.4 percent of students are members of minority groups. Typically children from minority groups, which are also often of lower socioeconomic status, have more serious educational challenges and are not as prepared when they reach school as are non-minority students.[5] This shift in the school-aged population has important implications for how Iowa schools and colleges implement strategies to help struggling students achieve academic and other successes.

…employers are feeling the crunch, with the convergence of older workers moving into retirement and semi-retirement, an overall state population that is not growing much, missed opportunities for college participation among many youths, an out-migration of college-educated young adults, and increasing skill requirements in the job market.

Enrollment decline. One factor that has a pervasive impact on education decisions throughout Iowa, including CTE offerings, is the overall decline of student enrollment over the past three decades. During this time, the statewide total enrollment of public education has declined at an average annual rate of 0.9 percent. There are 163,844 (25.3 percent) fewer students for the FY 2007 budget enrollment than there were in FY 1973. Enrollments fell by over 200,000 students between FY 1973 and FY 1991. In FY 1992 enrollments began to increase. Those enrollments topped out at 505,000 students in FY 1999, and then began declining to 483,105 in FY 2007. This downward trend is expected to continue for the next several years. Over the same period, the number of school districts has decreased from 452 in 1973 to 365 in FY 2007, a decrease of 87 (19.3 percent). In most years, the decrease was three or fewer school districts per year, but between FY 1992 and FY 1997, there was a decrease of 51 school districts.[6]

Fewer Adults with Postsecondary Education. Among its adults age 25 and older, 89.5 percent have completed high school, which is the second-highest in the Midwest and fifth highest in the United States. However, in terms of postsecondary education, the story is much different. Iowans are less likely to have any postsecondary degree (28.9 percent) than the national average (33.6 percent.) The gap of 4.7 percent equals at least 84,000 fewer adults with postsecondary degrees than there would be if the state were at the national average.[7]

Participation in Postsecondary Education. In terms of high school graduates attending college, Iowa fares relatively well, according to data compiled by the National Center for Higher Education Management Systems. 61.5 percent of recent high school graduates attend college at some level soon after graduating. This is the 11th highest rate of college-going in the United States. However, given that many states with higher college-going rates for high school graduates also have much higher drop-out rates than Iowa, they actually send a smaller percentage of all their youths to college than does Iowa. When estimating the percentage of 9th graders who are likely to enroll in college by the time they are 19 (and earn a high school diploma or GED), Iowa is the 4th highest state in the nation at 51.2 percent (exceeded by New Jersey (52.8), Minnesota (53.3) and North Dakota (61.8).[8]

Iowa competes well with other states in terms of educational percentages. But as a small state with approximately 37,000 high school graduates in 2004, it is significant that 38.5 percent of these graduates do not enroll in college (over 14,000 youths). As a small state, Iowa's economic health and competitiveness may be more directly affected by seemingly small numbers of individuals who either do or do not develop marketable skills that offer a higher economic payoff.

The Brain Drain. Another contributing factor to the relatively low percentage of adults with a college education is the so-called Iowa "Brain Drain." According to U.S. Census data, between 1995 and 2000, Iowa experienced the second highest net out-migration rate in the nation of young, single, and college educated residents (only behind North Dakota.)[9] During this time period, there was a net out-migration of over 18,390 individuals who had college, most of whom had four or more years of college.[10]

The Skilled Workforce Shortage

Adding multiple factors together, employers are feeling the crunch, with the convergence of older workers moving into retirement and semi-retirement, an overall state population that is not growing much, missed opportunities for college participation among many youths, an out-migration of college-educated young adults, and increasing skill requirements in the job market.

In 2003, regional surveys were provided to over 600 Iowa businesses and targeted industry clusters central to the state's economy, which are advanced manufacturing, life sciences, and information technology. Employers identified the lack of available skilled workers as the top workforce factor impeding the ability of Iowa businesses to grow or expand regionally.[11]

These trends may compound so that ***by 2012, there may be 150,000 more jobs in Iowa than workers to fill them.*** This would be the result of Iowa's stagnant population growth converging with impending baby boomer retirements. "By the same year, almost 45 percent of all occupations in the state will require postsecondary education or training. These are the job occupations most likely to provide family-sustaining wages".[12]

The State Potential Payoff of Human Capital Investment

The risks of non action are evident, but action to strengthen Iowa's workforce quality will yield economic benefits to individuals and the state's economy.

The Alliance for Excellent Education has published information on the possible economic impact of increasing high school graduation rates and reducing school failures. According to the Alliance's 2007 State Report, "these figures help illustrate the potential economic benefits to individuals and the state of investing in an improved high school system that better prepares all high school students for graduation.

- "More than 7,000 students did not graduate from Iowa's high schools in 2006; the lost lifetime earnings in Iowa for that class of dropouts alone totals more than $1.8 billion.

- Iowa would save more than $84 million in health care costs over the course of the lifetimes of each class of dropouts had they earned their diplomas.

- Iowa households would have over $563 million more in accumulated wealth if all heads of households had graduated from high school.

- More than $336 million would be added to Iowa's economy by 2020 if students of color graduated at the same rate as white students.

- If Iowa's high schools graduated all students ready for college, the state would save more than $53 million a year in community college remediation costs and lost earnings.

- Iowa's economy would see a combination of savings and revenue of more than $44 million in reduced crime spending and increased earnings each year if the male high school graduation rate increased by just 5 percent."[13]

The Individual Potential Payoff of Human Capital Investment

From an individual perspective, the payoff for educational investments is significant. In 2004, Iowan adults older than age 25 who had less than a high school diploma had median earnings of $18,043; high school graduates, including those with a GED, earned approximately $23,962.[14]

But adults with some college or an associate degree earn a median of $27,627 and those with a bachelor's degree earn a median of $37,330. That equals an annual earnings boost of 15.2 percent for an associate's degree and 55.8 percent for a bachelor's degree over a high school diploma. Over a 25 year span, those differences in earnings are approximately $91,600 and $334,200 respectively. Those with advanced degrees typically earn even more.

Postsecondary education typically gives the individual a bigger toolkit of knowledge and skills from which to build a career, and adapt more readily to changing job market situations. But the key to personal economic success is not just having a credential, but possessing the knowledge and skills that the credential represents.

Program Completion and Earnings

On the whole, individuals who participate in "some college" earn more than individuals who only have a high school diploma. But among those with some college experience, there is a clear benefit for those who complete their respective program of study compared to those who get some college experience then leave. Over a three year period, the earnings of those Iowans who complete their community college-based program increased by 101.46 percent, compared to a 51.54 percent earnings increase for those students who left community college before completion (see Table 1).[15]

Table 1
Median Annual Earnings of 2002 Iowa Community College Completers and Leavers
Fiscal Year 2002, Fiscal Year 2003, and Fiscal Year 2005

	Last Year in College Fiscal Year 2002		First Year Out Fiscal Year 2003		Third Year Out Fiscal Year 2005			
	# worked Four quarters	Median Annual Earnings	# worked Four quarters	Median Annual Earnings	# worked Four quarters	Median Annual Earnings	% change 2002-2005	% change 2003-2005
All students	20,512	$16,743	20,933	$21,399	20,419	$25,145	50.18%	17.50%
Completers	3,733	$14,006	4,245	$23,594	4,252	$28,217	101.46%	19.59%
Leavers	16,788	$15,959	16,688	$20,702	16,167	$24,184	51.54%	16.82%

Source: "Postsecondary Earnings of Iowa Community College Students", Iowa State University, May 2007

The Role of Industry Clusters in Fostering Growth

According to Iowa Workforce Development, industry clusters are a "group of inter-related industries that drive wealth in a geographic region - primarily through the export of goods and services. Industries in a cluster share buyers, suppliers, processes, and technology. Cluster industries utilize the same set of skills and tap into the same knowledge base and workforce in an area. Furthermore, industries within a cluster are able to share specialized services, networks, and research and development."[16]

There are a number of broad industry clusters that have been targeted in Iowa for future investment, drawing upon analysis done in the early 1990s and in 1999 by the Iowa Department of Economic Development. The key industry clusters are:

- Life sciences (including production agriculture, value added processing pharmaceuticals, and biotechnology);
- Advanced manufacturing (involving the rapid introduction of new processes including metal manufacturing and heavy machinery manufacturing); and,
- Information solutions (including financial services and information solutions).

By recognizing the existence of industry clusters (or the potential for clusters) in a region, decision makers are able to better prepare the workforce, align educational programs to projected growth areas, support the growth of the cluster, and increase wealth in the region.

The Iowa Works Campaign says that "investments in human capital should represent the centerpiece of Iowa's economic development policy, now and into the future. In a 21st century economy, Iowa's competitive advantage will be found in the skills and work ethic of its people."[17] One important asset for building the skills of Iowans is the state's Career and Technical Education system, offered at both the secondary and postsecondary levels. The next section provides an overview of general trends in CTE, and a review of Iowa's current CTE structure and programs.

Section IB. CTE in Iowa

This section of the report gives a general overview of some of the key policies, practices, and trends affecting Career and Technical Education in Iowa.

It draws from three very thorough sources published by the Iowa Department of Education. These are: *The Annual Career and Technical Education High School Report, 2007*, prepared by the Division of Community Colleges and Workforce Preparation; *Condition of Iowa Community Colleges, 2006*, also prepared by the Division of Community Colleges and Workforce Preparation; and *The Annual Condition of Education Report, 2006*, prepared by the Division of Financial and Information Services and the Bureau of Planning, Research and Evaluation. These reports provide extensive data and analysis of education conditions in Iowa and this report does not attempt to duplicate that material.

The Changing Face of Career and Technical Education

In its 2006 report on "Reinventing the American High School for the 21st Century," the Association for Career and Technical Education said that "given the magnitude of the CTE enterprise, it is vital that CTE educators and leaders be active participants in discussions about how to redesign American high schools for the needs of the 21st Century. CTE must bring its resources and expertise to the table." [18]

CTE is widely available. On a national basis it exists in most high schools (all high schools in Iowa), with 95 percent of high school students taking at least one course during their high school career and one third of high school students taking a concentration of CTE courses. Given this prevalence, it seems odd that CTE would be overlooked in discussions about education reform.

If CTE has been overlooked in discussions about education reform, why has this happened? There may be multiple factors involved: the history of CTE, its low level of visibility in comparison to the high visibility of standards-based education reform, and the fast-moving nature of economic change.

In the 20th Century, a strand of education for youth emerged called manual training, which was later known as vocational education. In its early years, it was a distinct parallel track for students who were gifted with mechanical aptitudes, and was well regarded as a way to enter the skilled trades. Parallel programs emerged for young women emphasizing the science of domestic life and homemaking. Another track of general "life adjustment" education developed in many high schools that was regarded with less prestige than either college preparatory or vocational education. However, during the late 1970s, vocational programs lost their prestige as an education alternative as more and more youths pursued a college track. In concert with the development of community colleges and technical colleges in the 1960s and 1970s, college-level CTE programs began to grow in prominence at the two-year college level and developed a stronger connection with employers.

At the high school level, programs that were once clearly aligned to specific job opportunities gradually became seen as electives for the "non-college bound." As the standard-based education reform movement emerged in the 1980s and 1990s, many reformers promoted a "college for all" approach (either explicitly or implicitly) that further devalued vocational education.

In the 1990s, with reforms to federal legislation, vocational education began to be reinvented as Career and Technical Education. A new emphasis on challenging academic content was placed in the federal law, requiring CTE educators to "integrate" academic content into CTE courses, so students would be

equally prepared for jobs and careers that required additional education beyond high school. The Tech Prep program was created to encourage high schools and colleges to collaborate around closely aligned programs. Tech Prep programs were intended to allow a student to move seamlessly from high school to college and continue a course of study leading to a degree or certificate in a high-skill, high-wage field. At the same time, some high school reform advocates were bemoaning the lack of engagement of many high school students within the large, traditionally academically-focused comprehensive high school. These reformers urged the creation of small, more personalized schools. As a related remedy, reformers and other elected leaders have innovated with career academies, which link college-preparatory academic classes with other classes that emphasize relevant career skills and experiences.

As interstate and global economic competition continued to heat up, some education leaders decided that academic standards for students were neither sufficiently clear nor rigorous enough to ensure "readiness" for college or the high-skilled workforce. With the American Diploma Project analysis of college readiness and high-skilled employment expectations, a new definition of "readiness" emerged.[19] According to the American Diploma Project, the high school diploma needs to have new meaning attached to it – earning a diploma should mean the graduate is truly ready for further education (without remediation) or to enter a high-skilled, high-wage workplace (this definition of work readiness intentionally excludes low-skill, low-wage jobs). New data emerged from the Manhattan Institute showing that dropout rates were far higher than previously reported – a sign that students were either bored and disengaged, academically struggling, or both.[20]

As the rigor and readiness agenda has risen to the forefront of attention, education leaders realize that traditional educational methods are not likely to succeed in keeping students engaged in high level learning needed in the 21st century.

In large part, even supporters of CTE support it with a traditional education system in mind. CTE (or voc-ed) may be deemed necessary for "those other kids" – the ones who are less able academically and are non-college bound. While many CTE programs are very demanding academically and quite lucrative in earnings, the old notion of "vocational education" for the less able remains strong among many well-intended policymakers.

What is less understood is the higher level of academic skills, and general workplace skills like teamwork, communications, and customer services, which are required in the health sciences, engineering, information technology, and industrial technologies.

What is also less understood is the emergence of blending CTE with math and science, such as through the Project Lead the Way pre-engineering program, Project Lead the Way's new Biomedical Science program, and the forthcoming Curriculum for Agricultural Sciences Education (CASE) that is being developed by the National Council for Agricultural Education.

While individual course content has been updated and upgraded in some areas, the entire structure of CTE is also being reconceived through the Career Clusters concept. While discussed in more detail later in this report, Career Clusters provides a structure that can end the programmatic isolation of CTE by connecting it with broad high school reform, postsecondary education and training, and economic development.

Much has changed for good over recent years. Career and Technical Education is becoming a much different enterprise than in the past. Reforms since 1990 have created strong connections between CTE high school courses and CTE courses offered at community colleges, including extensive agreements for sequenced courses (known as articulation agreements) and also the ability of high school students to enroll in and earn postsecondary credits. These inter-system policies allow students to earn college level credit as high school students, and often be awarded high school credit as well.

Career and Technical Education in Iowa

While there are general national trends that have characterized the development of Career and Technical Education, each state's policies, governance structure, and traditions create a version of CTE that is unique to that state. As with all states, this is true in Iowa as well.

The following sections describe the policies, structures and traditions that have shaped Iowa's unique brand of Career and Technical Education. Each decision that shaped Iowa CTE was made by individuals for a specific reason that was relevant at the time. Various policies, made at different times and for various purposes, intersect with one another in a way that could not have been anticipated in advance. While there may have been historical reasons for certain policies and structures, it is important to view them in their totality, and review if they are sufficient to address current challenges. With that mindset, we review the components of Iowa Career and Technical Education.

Cross-System Collaboration between Secondary and Postsecondary CTE

One of Iowa's hallmarks is the way it has encouraged postsecondary enrollment among its high school students and close connections between high school and postsecondary programs. The next several sections explore a variety of policies and activities that have contributed to a high level of collaboration between high school CTE and CTE delivered by community colleges. These policies – the 28E agreement, supplementary weighting, career academies and Tech Prep, the Iowa Communications Network, and policies governing teaching requirements for shared courses – all contribute to an environment that can either encourage, or discourage, cross-system collaboration.

During the last decade, Iowa has been recognized as a national leader for the development of its innovative Career Academy programs…

As a result of the efforts to expand college credit opportunities for high school students, during the 2005-2006 academic year, Iowa's community colleges reported an unduplicated headcount enrollment (meaning each student was counted only once, even if they took multiple courses) of 22,905 high school students. This is an increase of about 46 percent over the previous five years. Roughly four out of five of these courses were under cost-sharing plans that generate supplementary weighting for school districts. [21]

The remainder of college credit courses was offered to high school students under the Postsecondary Enrollment Options (PSEO) Act. By the 2005-2006 academic year, concurrently enrolled high school students made up nearly a fifth (19 percent) of the entire student body at Iowa's community colleges and earned over 9 percent of all credit awarded. [22]

The leadership challenge is to maximize the incentives for collaboration, and minimize the barriers to collaboration.

Emergence of Career Academies in Iowa

During the last decade, Iowa has been recognized as a national leader for the development of its innovative Career Academy programs, offered to high school students in partnerships between community colleges and school districts. These Career Academy programs are offered under various names at their respective colleges such as "Career Edge Academies," "Career Advantage,""College and Career Academies," and "Career Link Academies."

While Tech Prep and Career Academies are both programs of study articulating instruction and secondary and postsecondary institutions, they grew out of different funding strands. Tech Prep was originally authorized to receive funding through the Carl D. Perkins Vocational and Applied Technology Education Act of 1990. Tech Prep funds are distributed to 15 regional consortia. Through intergovernmental agreements, each consortium includes the area education agency, community college, and K-12 school districts.

To reduce confusion over terminology, the general term "Career Academy" was adopted in Iowa to describe all Career Academy and Tech Prep activities, although individual colleges still retain their "brand names" for these programs. In 2003, the Iowa legislature authorized career academies to receive support through the Grow Iowa Values Fund, as well as Supplementary Weighting funds.[23]

Several community colleges within the state, such as Des Moines Area Community College, Hawkeye Community College, Iowa Lakes Community College, Iowa Western Community College, Kirkwood Community College, North Iowa Area Community College, and Western Iowa Tech Community College offer a range of Career Academy programs.

These programs typically combine at least two years of secondary education and two years of postsecondary education, with the opportunity for students to earn up to one year of college credit while still in high school. Some programs offer work-based learning activities, career counseling services, and offer advanced placement into the related college program.

Every college and its partners offer a different mix of Career Academies, based on regional workforce needs and priorities. Among the many Career Academies offered within Iowa are advanced manufacturing, agriculture, automotive collision, automotive technology, biotechnology, broadcast and telecommunications, building trades/finish carpentry, computer programming, criminal forensics, culinary arts, diesel technology, education and human services, electro-industrial maintenance, engineering, geospatial, graphics and media communication, health occupations, health science, information systems management, international studies, landscape and turf grass technician, local area networking, marine and small engine technology, production engineering, web page design, and welding.

Because they are offered in partnership with the resources of the community college and the scale of multiple students participating from various sending high schools, they can offer programs on a scale that might not be feasible for an individual school, particularly a small rural school.

Because of the scale of their programs and the wide geographic area from which the academies draw, some colleges, such as Des Moines Area Community College and Kirkwood Community College are working with their respective partner districts to create regional centers that are more centrally located and accessible to more students. In August 2006, DMACC opened the Hunziker Center in Ames Iowa, and Kirkwood is currently developing the Jones Regional Center in Jones County.

The Career Academy "movement" in Iowa defines the future of CTE in the state, and represents an important opportunity to increase college participation and program completion among Iowa's youths.

Policies That Support Inter-System Collaboration

The 28E Agreement

One of the most innovative public policies promoting inter-agency cooperation is the so-called "28E Agreement" based on Section 28E of the Iowa Code. The purpose of this chapter of the Iowa code is "to permit state and local governments in Iowa to make efficient use of their powers by enabling them to

provide joint services and facilities with other agencies and to cooperate in other ways of mutual advantage. This chapter shall be liberally construed to that end." [24]

Under the 28E provisions, any power or privilege that is exercised by one public agency may be exercised and enjoyed jointly with another public agency, or with any other public agency in another state. One possibility is that the joint exercise and cooperative action may also include the creation of a separate entity to carry out the purpose of the 28E agreement. Any agreement must establish the length of time for the duration of the agreement, the precise organization and nature of the agreement, its purpose or purposes, the manner of financing the joint agreement, the methods to accomplish the agreement and how the agreement will be ended. The Iowa Secretary of State has the authority to approve or disapprove 28E agreements.

College Credit for High School Students and Supplementary Weighting

While high school students had been allowed to take college courses at their own expense, the Postsecondary Enrollment Options Act (PSEO) permitted high school students to enroll in courses at institutions of higher education at little or no cost if those courses were not offered by their local school districts. Through the PSEO Act, the school district would pay a maximum of $250 per student per course to the postsecondary institution. PSEO courses were usually taken at college facilities.[25]

Given population shifts and declining enrollments, many schools in Iowa, particularly those in smaller rural areas, are challenged to maintain the facilities, equipment, technology, and faculty expertise necessary to offer high quality and rigorous CTE programs on their own.

In this context, the Iowa Legislature created the Supplemental Weighting Plan, to support collaboration among school districts and with community colleges for offering CTE and other educational programs. The Supplemental Weighting gives an extra portion of funding through the local school foundation formula for students enrolled in classes offered by other districts or by community colleges.

The *Iowa School Foundation Formula* was created between 1970 and 1972. The formula is a student-driven financing mechanism that balances revenues from state sources and local property taxes. In October of each year, a count of enrolled students is taken, and this becomes the basis for the following year's budget. The formula takes into account the added costs of teaching special education students, English language learners, at-risk students, and "shared" students and teachers. These costs are provided as a "weighting factor" in addition to regular program enrollment count. Students taking courses at community colleges are considered "shared" students for the purposes of the weighted formula. A school district budget is primarily the weighted enrollment multiplied by the cost per pupil.[26]

The supplemental weighting plan provides funding to local schools for classes offered by other districts or community colleges. Generally, local school districts contract with community colleges for courses not offered at their high schools, allowing students to take advantage of advanced courses at little or no cost. Contracted (or shared) courses are offered in a variety of settings such as college campuses, local high schools, and at other locations. In 2005, nearly half of these courses were offered at high schools using community college curricula.

The supplemental weighting for classes that are shared between one school district and another is 10 percent in additional funds for the portion of the student's day spent in a shared course. The weighting amount for a course shared with a community college is 48 percent.[27]

Iowa Code 257.11 (3b. 1-7) provides the conditions on which a student attending a community college class is eligible for supplemental weighting (emphasis added):

- The course must supplement, not supplant, high school courses;
- The course must not replace the identical course that was offered by the school district in the preceding year or the second preceding year;
- The course must not be required by the school district in order to meet the minimum accreditation standards in Iowa Code section **256.11** ;
- The course must be included in the community college catalog or an amendment or addendum to the catalog;
- The course must be open to all registered community college students not just high school students;
- The course must be for college credit and the credit must apply toward an associate of arts or associate of science degree, or toward an associate of applied arts or associate of applied science degree, or toward completion of a college diploma program;
- The course must be taught by a teacher meeting community college accreditation standards;
- The course must be taught utilizing the community college course syllabus; and
- The course must be of the same quality as a course offered on a community college campus.

As long as the college course does not violate the non-duplication, non-supplanting requirements of Code 257.11, a student can take a college credit academic course that is eligible for supplementary weighting.

Core Courses for School Accreditation

Supplemental weighting is NOT provided for courses that are required to be offered and taught by a school to meet accreditation in Iowa Code section 256.11. From the required units to be offered (with the exception of physical education), each school must offer 40 units of instruction, with 12 of those being CTE units, in order to maintain its state accreditation.

So, for instance, since the school is required to offer six units of English, the school might be allowed to meet this minimum course requirement by creating a 28E arrangement with the college to offer a course that counts as one or more of the six English units. But since these courses were required to be in place for high school accreditation, they would not be eligible for supplementary weighting.

One of the more important school accreditation requirements is that **each school district must maintain a sequence of three CTE courses of study in four of the six program areas**. For some small districts, it is difficult to maintain the full complements of programs through its in-house resources and teachers. So, while this is not actively promoted, the program approval process does allow for joint administration of CTE programs through a 28E agreement for providing us some of these courses of study.[28]

The interaction between school accreditation, supplemental weighting, and the Model Core Curriculum (mentioned below) is very complex. In discussions with administrators and teachers, there seemed to be significant confusion about how to apply these rules and policies in the most beneficial way possible.

There is an important opportunity to review these policies as a whole, and provide unified guidance to schools and colleges on how they can be implemented.

ICN and Online Courses

The Iowa Communications Network (ICN) is a fiber-optic network which makes it possible for Iowans, physically separated by location, to interact. The network creates partnerships with education, medicine, the judicial system, government agencies, and the National Guard, and brings live, full-motion video to 758 classrooms around Iowa, located in schools and other community facilities. [29]

In spring of 2007, the education appropriations bill, SF 588, was enacted to allow weighted funding for high schools that share ICN classes, as well as an incentive for high school teacher costs to be covered. The weighting equals 1.05 percent for the percentage of the school day that the student spends in the class. [30]

Faculty Requirements

Iowa Code section 257.11(3) asserts that to be eligible for supplementary weighting for shared courses for which it contracts, one of the criteria is that the courses must be taught "by a community college-employer instructor." The Iowa Department of Education has provided clarification to this provision, that a high school teacher or other qualified teacher who is hired on a contract basis by the community college to teach the shared course meets the criteria of being a "college-employed instructor." The term "college-employed" can include direct payment to a high school instructor by the college, or a reimbursement arrangement between the college and the school district to pay for the services of a school-district employed instructor.[31]

To ensure rigor, the courses use community college curricula and the concurrently-enrolled students have to take community college assessments; these students are held to the same expectations as other college students.[32]

It does NOT appear that the federal *No Child Left Behind Act* directly impacts the qualifications of CTE teaching, since CTE courses are not identified in the law as core academic subjects. So the teacher credentials of college faculty teaching CTE courses for high school credit are not a significant obstacle. On the converse, however, given state rules over college teaching requirements, a high school faculty can only teach a college CTE course if the teacher also meets standard college faculty requirements (typically having a master's degree).

Community College to Baccalaureate Articulation

Articulation agreements have been an important mechanism to allow the smooth transition of students from high school to community college CTE programs. There is also significant progress in Iowa in articulating community college to other postsecondary institutions so students will know how their community college credits will transfer and satisfy specific major requirements at the university level. A working group has been established, called the Liaison Advisory Committee on Transfer Students (LACTS), which addresses articulation/transfer issues. The committee is made up of six voting members (three from the community colleges and one member each from Iowa's three Regents universities) and an ex-officio member from the Department of Education.

In previous years, the committee helped develop eight statewide agreements, which are reviewed and reaffirmed annually. During the 2006-2007 academic year, the committee approved a new Associate of Science Degree articulation agreement. [33]

Another tool to ease the transition of students into community colleges and transferring to the Regents universities is the common course numbering system, which was implemented in the fall of 2006.

Iowa State University is assessing the creation of a Bachelor of Applied Science or Bachelor of Technology degree program to improve the transition of students from community college technical degree (AAS) programs. The program would be modeled after the Bachelor of Applied Studies the University of Iowa began offering in the 2005-2006 academic year.

Governance of CTE in Iowa

The State Board of Education, established by Iowa Code section 256.1 and appointed by the Governor, has the responsibility in the State of Iowa to establish policy and adopt accreditation rules for the operation of Iowa schools, area education agencies, and community colleges. In this role, the State Board of Education has responsibility for K-12 school districts, area education agencies, and community colleges serving students in credit courses and adult and continuing education students in noncredit courses. Additionally, the Iowa State Board of Education constitutes the state board for Career and Technical Education [34]

> *Among Iowa high school students in 2006, 206,896 students were enrolled in career and technical education programs…a 38.31 percent increase in participation since 2002.*
>
> Annual CTE High School Report, 2007

In Iowa, the Department of Education Division of Community Colleges and Workforce Preparation has direct jurisdiction over CTE at both the high school and community college levels. Among the states, it is relatively unusual for one agency to have direct jurisdiction over CTE at both the high school and community college levels. This affords Iowa the opportunity to create one of the most seamless high school-to-community college connections in the nation.

The Iowa Department of Education is charged with carrying out the policies of the State by administering the education laws passed by the Iowa General Assembly and Congress. Another role of the Department is to provide leadership to local school districts, area education agencies, and community colleges that goes beyond the regulatory function of compliance with state or federal statutes or rules. That leadership is focused on the State Board of Education's stated goal for education in Iowa:

- "All children will enter school ready to learn.
- All K-12 students will achieve at high levels, prepared for success beyond high school.
- Iowans will pursue higher education that results in an improved quality of life supported by better economic opportunities through high skill employment."[35]

The state is divided into education regions. In each region, Area Education Agencies (AEAs) provide a basic core of services to K-12 districts, with some variations depending on the needs of the schools and students each serves. Funds for AEAs come from a combination of direct state aid, local property taxes, and various grants. The divisions within an AEA include: Special Education, Media Services and Educational Services. The board members are elected by and represent local district school Boards of Education. Boundaries of the AEAs were established to be coterminous with the boundaries of the merged area schools in 1974. Today, several AEAs have consolidated.

Public postsecondary two-year institutions in Iowa are organized as comprehensive community colleges. Each college serves a multi-county merged area, which may vary in size from four to twelve counties. All Iowans of postsecondary school age are eligible to attend any of the community colleges. The community college boundaries have remained reasonability stable since their creation.

The Iowa Department of Education's Division of Community Colleges and Workforce Preparation is responsible for coordinating statewide efforts in support of community colleges. The Division is also responsible for adult education programs, coordinates secondary and postsecondary career education, and supervises veterans' and military education for postsecondary institutions.

One of the major responsibilities of the Division is Career and Technical Education in Iowa, including development of the state's plan for implementation of the Perkins Act. Programs and services provided by this Division include assistance with effective practices, program approval, technical assistance, funding, and career and technical student organizations. State staff members designated as "educational consultants" have responsibilities for state identified CTE service areas, as well as entrepreneurship, academics, articulation, cooperative education, corrections, gender equity, guidance and counseling, labor market materials, program evaluation, regional planning, Tech Prep, and special populations.

CTE Program Offerings

There are six service areas that have traditionally been offered in Iowa's CTE system at the high school and community college level. These are:

- Agri-science and natural resources (agriculture education);
- Business and information technology (business and office education);
- Engineering and industrial technology (industrial education);
- Health sciences (health occupations education);
- Family and consumer sciences (home economics education); and
- Marketing (marketing education).

Based on requirements from the U.S. Department of Education, states have been required to report program participation according to an organizational model called Career Clusters, which are discussed in more depth later.

The 16 Career Clusters are (See Appendix 1 for more information about the clusters):

1) Agriculture, Food, and Natural Resources;
2) Architecture and Construction;
3) Arts, Audio and Visual Technology, and Communications;
4) Business, Management, and Administration;
5) Education and Training;
6) Finance;
7) Government and Public Administration;
8) Health Sciences;
9) Hospitality and Tourism;
10) Human Services;
11) Information Technology;
12) Law, Public Safety, Corrections and Security;
13) Manufacturing;
14) Marketing, Sales, and Service;
15) Science, Technology, Engineering, and Mathematics; and
16) Transportation, Distribution, and Logistics.

CTE Participation Trends

Participation in CTE in Iowa is growing quickly. Among Iowa high school students in 2006, 206,896 students were enrolled in Career and Technical Education programs – a 38.31 percent increase in participation since 2002.

At the high school level, the Business, Management, and Administration career cluster has the largest career and technical discipline enrollment of 52,561 participants.* This represents 25.40 percent of all CTE participants. The Human Services cluster was second with 22.03 percent of participants (45,575) and the Architecture and Construction cluster was third with 12.41 percent of participants (25,669). [36]

Among community college enrollments in Fiscal Year 2005, Health programs had the highest enrollments with 18,941 participants (37.56 percent). Industrial Technology programs were the second highest with 13,266 participants (26.30 percent) and Business programs had 12,015 enrollments (23.82 percent). Agriculture, Family and Consumer Science, Marketing and Multi-Occupations represented the remainder of the program enrollments, all with less than five percent. [37]

CTE Teacher Supply

The number of full-time CTE teachers in grades 9-12 was 1,761. There was a decline of 76 teachers (4.2 percent) from Fiscal Year 2002 to Fiscal Year 2006.[38] In Fiscal Year 2006, there was a total of 6,931 instructional staff employed in Iowa's Community Colleges. 1,966 were full-time, 389 were part-time, 31 were temporary, and 4,545 were adjunct faculty.[39] The state's data system does not distinguish between CTE instructors and academic subject instructors at the community college level.

The average age of high school CTE teachers has remained nearly constant (46 years old) since Fiscal Year 2002. The average age of community college was not calculated, but the largest percentage of instructors falls in the age range of 40-55 (41.61 percent of instructors).

The percentage of secondary Career and Technical Education teachers that are female has increased from 44.3 percent in Fiscal Year 2002 to 46.2 percent in Fiscal Year 2006.[40] At the community college level, the percentage of female staff has increased slightly from 58.01 percent in FY 2005 to 59.06 percent in FY 2006.

Among the health sciences teachers there were only 13 health sciences teachers in the state at the secondary level with an average age of 52.2 years. For agriculture and natural resources there were 205 teachers; for business and information technology there were 641 teachers; for engineering and technology there were 477 teachers; for family, consumer and health sciences there were 360 teachers; for marketing there were 101 teachers; and others had 348 teachers.

The State Department of Education does not currently aggregate or report the numbers of community college instructors by CTE program area.

CTE Funding in Iowa

Federal Funding Through the Perkins Act

Funds are distributed through the Carl D. Perkins Career and Technical Education Improvement Act of 2006 to all states based on a formula that takes into account the relative population of each state. The national appropriation for the Perkins program has been approximately $1.1 billion for a number of years, with an additional $105 million appropriated for the Tech Prep program.

It should be noted that, while the federal appropriation has held relatively steady for the past several years, Iowa has been losing its relative share of the federal appropriations, based on national population

* Participation data used here for high schools is disaggregated by the career clusters model, while the postsecondary participation data is disaggregated by the six service areas.

shifts reflected in the 2000 Census that are being phased in. For example, in Fiscal Year 2004, Iowa's title I allocation from Perkins was $13,393,636, and the title II (Tech Prep) allocation was $1,245,235. By FY 2006 the title I allocation had fallen to $12,320,501, while the title II allocation stayed at the FY 2004 level. The overall reduction for title I was $1,073,135, an 8.01 percent decrease.[41]

Based on the formula distribution in the Perkins act, funds allocated to Iowa for Fiscal Year 2007 were $12,320,501. Of this amount, up to 5 percent was allowed to be retained by the Iowa Department of Education for program administration, which would equal over $600,000. Another 10 percent is allowed by Iowa Department of Education to be allotted for state program improvement and leadership, equaling about $1,232,050. The remainder of the state's FY 2007 allocation is distributed to local school districts and community colleges. Of the amount designated for local uses, 56 percent of funds go to school districts, equaling approximately $5.8 million. 44 percent of the local funds are distributed to community colleges, equaling about $4.6 million.

The state also received an allocation through the Tech Prep program of $1,245,235. Approximately 5 percent of these funds were retained at Iowa Department of Education for administration purposes and the remainder of funds was allocated for program purposes.

State Funding for High School CTE

The state vocational aid appropriation is the only categorical state funding targeted specifically toward CTE offerings in Iowa secondary schools, and in Fiscal Year 2006, the appropriation was a little over $2.9 million, down from $3.3 million in 1992 (See Table 2).

Table 2
State Vocational Appropriations and Reimbursement of Direct Instructional Costs

Fiscal year	State appropriation	Percent change from previous year	Direct instructional costs	Percent change from previous year	Reimbursement rate
1992	$3,308,850	-6.73%	$32,513,693	10.28%	10.18
1997	3,308,850	0.00	36,779,507	8.00	9.00
2002	3,134,903	-5.26	48,305,631	11.18	6.49
2003	2,936,305	-6.34	51,361,750	6.33	5.72
2004	2,877,909	-1.99	50,340,356	-1.99	5.72
2005	2,936,904	2.05	55,364,319	9.98	5.30
2006	2,936,904	0.00	57,812,423	4.42	5.08

Source: Iowa Department of Education, Bureau of career and technical education information system.
The annual career and technical education high school report 2007, page 35

In absolute terms and in terms of the direct instructional costs of CTE offerings, state support for high school Career and Technical Education offerings has decreased in recent years. The percentage of direct instructional costs reimbursed through state vocational appropriations has fallen from 10.18 percent in Fiscal Year 1992 to 5.08 percent in Fiscal Year 2006.

In Fiscal Year 2005, the total Iowa expenditures for high school CTE programs (including federal, state and local expenditures) was approximately $107.7 million for CTE, a modest increase of 6.37 percent over the level of funding from four years earlier in Fiscal Year 2001. [42]

One important requirement of the Perkins Act is that, to receive funding for CTE, states must demonstrate "maintenance of effort." This requires the state to maintain overall expenditures for CTE at the level of

previous years, although there is a narrow allowance made for a state that must reduce expenditures when the state and local governments experience severe economic hardship.[43]

The Workforce Training and Economic Development Fund

One important funding resource in Iowa's education and training infrastructure is the "Workforce Training and Economic Development Fund." This $11.5 million fund (authorized by Iowa Code 26-0C.18a) supports community college CTE programs, as well as incumbent worker retraining and career academy programs with high school partners. A large percentage of the fund (70 percent) is required to be focused on the state's targeted industry clusters, which as of 2007, also includes renewable energy. In the 2007 legislative session (for FY 2008), $7 million was designated to this account from the Grow Iowa Values Fund (mostly for targeted industry clusters), $2.5 million from the new Iowa Power Fund, and $2 million from the Rebuild Iowa Infrastructure Fund. This is a significant increase from previous funding levels of $3.758 million in FY 2004 and $7 million in FY 2007.

Some community colleges have used the Workforce Training and Economic Development Fund resources to cover up-front investments in equipment, curriculum, staffing, and facility improvements to create new Career Academy programs, allowing for more traditional funding streams to cover the ongoing cost of the career academies in the following years. For example, in 2005, Kirkwood Community College applied $550,000 from this fund to cover targeted costs associated with its Career Edge career academy programs, impacting hundreds of students and creating seamless transition opportunities for students to move from high school to college programs. The availability of these funds and their effective investment at the community level is a key factor for expanding education and training opportunities for Iowa's youths and adult workers.

State Support for and Approval of Secondary CTE Programs

Through the annual appropriation to the State Vocational Reimbursement Fund, local school districts are eligible to receive partial reimbursement for the cost of locally-delivered CTE programs. To be eligible for this funding, local school districts submit their CTE programs to be reviewed and approved by the Iowa Department of Education.[44]

The State appropriates direct vocational aid on an annual basis. When each district enters the programs that have been approved, it also indicates the direct instructional costs in teacher salaries and related expenses associated with that program. The Iowa Department of Education makes a pro-rated distribution to each district, based on its share of the overall direct instructional costs it incurred. In 2006, the overall direct instructional costs for approved programs was over $57 million, and the state appropriation was $2.9 million, which equaled about 5 percent of those instructional costs.

Programs seeking state approval must meet the following criteria:

- Contain a **minimum sequence of three units of instruction** responding to a minimum set of performance indicators (competencies);
- Utilize content standards and benchmarks – competency-based (performance indicators) curriculum that reflects current industry standards;
- Demonstrate responsiveness to student interest and labor market needs;
- **Strengthen academic skills** through Career and Technical Education curriculum;
- **Provide articulation** with a postsecondary institution;
- Assess the extent to which the performance indicators (competencies) are being mastered;
- Provide **access and equity** for all students;
- Utilize input from an advisory councils/committee;

- Prepare students for entry-level employment, self-employment, and/or postsecondary education within their chosen field;
- Provide students with **leadership opportunities** that are related to their chosen field of study;
- Provide students with **employability skills**; and
- Provide students with information on **new or emerging technologies**.

Accreditation of PreK-12 Schools and Required Course Offerings

Section 256.11 of the Iowa Code establishes the educational standards for maintaining accreditation for preK-12 instruction. The State Department of Education carries out the accreditation processes for Iowa K-12 schools. If a district loses its accreditation and does not correct the accreditation issues, ultimately the State has the authority to merge the district with an adjoining district.

Section 256.11 lays out a minimum number of courses that must be offered by an accredited school. In grades nine through 12, a unit of credit is defined as a course or equivalent related components or partial units that are taught through the academic year.

The minimum program to be offered and taught in grade 9 through 12 is:

- Six (6) units of English Language Arts;
- Four (4) units of a sequential program in mathematics and two (2) additional mathematics units;
- Five (5) units of science (including physics and chemistry);
- Five (5) units of social studies;
- Four (4) sequential units of one foreign language other than American sign language;
- For CTE, three (3) sequential units in at least four of the six vocational service areas;
- Three (3) units in the fine arts;
- One (1) unit of health education; and
- All students participate in physical education activities with some allowable exceptions, such as for work study or other athletic program activities.

Career and Technical Student Organizations

Career and Technical Student Organizations (CTSOs) are programs that engage students in co-curricular activities that are closely related to CTE classroom programs. Young people involved in CTSOs each work regularly with an adult supervisor to prepare for local, regional and national competitions, take on student leadership roles in the organization, and develop a range of project management, public speaking, and leadership skills.[45] CTSOs provide a unique program of career and leadership development, motivation and recognition for youth and adult students who are enrolled in Career and Technical Education programs at the secondary and postsecondary levels, respectively. The Iowa Department of Education designates its staff members to work with the state CTSO's, helping them meet national guidelines for CTSO affiliation, carrying out state plan objectives relating to CTSOs, and facilitating the integration of CTSO activities into local CTE programs.

In Iowa, CTSO's have experienced modest growth in recent years. The total number of CTSO chapter membership increased by 484 to 20,147 students between Fiscal Year 2002 and 2005.[46]

CTSO's in Iowa include:

- Iowa Association of FFA;
- Postsecondary Agriculture Students (PAS);
- Business Professionals of America (BPA) secondary;
- Business Professionals of America (BPA), postsecondary;
- Family, Career, and Community Leaders of America (FCCLA);
- Health Occupations Students Association (HOSA);

- Future Business Leaders of America (FBLA), secondary;
- Phi Beta Lambda (PBL), postsecondary;
- DECA, secondary;
- Delta Epsilon Chi, postsecondary;
- Iowa Association of Skills USA, secondary;
- Iowa Association of Skills USA, postsecondary; and
- Technology Student Association (TSA), secondary.

Career Planning and Exploration

Iowa's Career Information and Decision-Making System (CIDS) is made available to middle and high school students through a partnership between the Iowa College Student Aid Commission, the College Planning Center (a division of the Iowa Student Loan Equity or Liquidity Corporation), and the Iowa Department of Education. *Iowa Choices*, a web-based career development system by the vendor *Bridges*, is designated as the CID System for the State of Iowa, although local institutions are able to adopt other systems.[47]

Iowa Choices includes occupational and educational information that is customized to Iowa and updated at least once a year. The system involves the creation of an online portfolio that students can continue to access as they move from middle school to high school and college. The system includes lesson plans, activities, parent and student guides, and reporting features for use by the schools.[48] According to the Iowa Department of Education, nearly 50,000 portfolios were created by middle and high school students and more than 63,000 portfolios were active on the *Choices* system during Fiscal Year 2006.

The *Iowa Career Resource Guide* was published in 2006.[49] An original run of 70,000 copies were provided to Iowa schools and Iowa Workforce Centers.[50] The publication was jointly released by the Iowa Department of Education Division of Community College Workforce Preparation and Iowa Workforce Development, Division of Workforce Center Administration. The guide contains information about the Iowa Career Information Decision-Making System and how students and adult learners can access those resources. The guide organizes career opportunities using the 16 Career Clusters approach. Within each of the clusters a number of occupations are profiled. For each occupation, there is a short description of the work, and an indication of average entry-level, average-level and experience-level wages, along with a visual marker that indicates whether the occupation is growing, stable, or declining. A PDF of the guide is currently available online at http://iwin.iwd.state.ia.us/pubs/careers/intro.pdf.

The guide also indicates for which occupations the Iowa Public Television has created video profiles to be accessed on the IP TV website.[51] Additional information includes an emphasis on the career exploration and planning process, and the type and length of education and training typically required. Information about college entrance, financing, and schools offering specific programs in Iowa is also provided. The guide is a thorough resource to assist a student and his or her parents in thinking through the connection of education and careers.

Iowa High School Reform and Redesign

Another important factor for consideration is the intersection of CTE with broader school reform. Since most CTE happens at the high school level (9-12), it is valuable to review general priorities and concerns about improving results for youths enrolled in high school. The following three sections explore key activities in Iowa – the state's effort to support and lead high school reform and redesign, development of a Model Core Curriculum and requirements for a locally-developed core curriculum, and new graduation requirements.

Since 2005, the Iowa High School Project has been engaging school leaders in an intensive and ongoing discussion of high school redesign. The project is jointly supported by the Iowa Department of Education and the International Center for Leadership in Education (ICLE), and facilitated by Area Education Agency 13.

In December 2005, 20 Iowa high schools were selected to become inaugural partners in the Iowa High School Project, a three-year project of ongoing financial support from the Department of Education and technical assistance from the International Center for Leadership in Education. The purpose of the project is to support reform efforts in high schools that have a concentration on struggling learners with the "rigor and relevance framework." Area Education Agencies are partners in the initiative to provide consultation, support and expertise. The State Board of Education anticipates 20 additional schools in 2007 and another 20 schools in 2008.[52]

In concert with the project, the Iowa Department of Education has sponsored three annual high school summits, all widely attended by teachers and administrators throughout Iowa. Topics of discussion at the summits have included: literacy across the curriculum, the "Breaking Ranks" reform model, math and science standards, school leadership teams, and the challenges of the 21st century workforce and global economy.[53]

At the December 2006 summit, Career and Technical Education was addressed specifically for the first time as part of the state level initiative.

The Model Core Curriculum

One of the most significant education reforms in Iowa is the development of the Model Core Curriculum project for high schools. The project was developed in response to needs identified by the Iowa Department of Education and the State Board of Education through an intensive high school information and data gathering process undertaken in the spring of 2005.

In the 2005 legislative session, the Iowa Legislature passed Senate File 245, a bill that required the State Board of Education to identify a *Model Core Curriculum*. The legislation also establishes a statewide goal that 80 percent of students graduating from secondary schools will have completed a core curriculum. SF 245 does not require that local districts adopt the Model Core Curriculum, but each district is required to identify a core curriculum and to work with every eighth grade student to develop a plan so that the student will graduate having completed the district's core curriculum.[54] Beginning with the class of 2011, school districts will be required to annually report the percentage of students graduating from high school who complete the locally-determined core curriculum.

The Final Report, *Model Core Curriculum for Iowa High Schools*, was presented to the State Board of Education in May 2006, and places emphasis on literacy, mathematics, and science. According to the Iowa Department of Education, the Model Core Curriculum is based upon "a review of research and best practice literature, examination of national standards; and information from Iowa Testing Services, the National Assessment of Educational Progress, ACT, and the College Board."

According to the report, the purpose of the Model Core Curriculum project is twofold:
To ensure that all Iowa students have access to a rigorous and relevant curriculum to prepare them for success in postsecondary education and the emerging global economy; and
Provide a tool for Iowa educators to use to ensure that the essential subject matter is being taught and essential knowledge and skills are be learned.
The report states that "Iowa graduates who know these essential concepts and possess these essential skills should find success in any post-high school endeavor, whether that be in a classroom or in the workplace."[55]

High School Graduation Requirements

A related piece of legislation, Senate File 2272, was passed by the Iowa state legislature in 2006. This bill establishes that, beginning with the graduating class of 2010, students must earn four credits in English language arts, three credits in math, three credits in science, and three credits in social studies to earn their high school diploma. These minimum requirements are commonly referred to as the "4-3-3-3 requirement."[56]

Community Colleges in Iowa

The enabling legislation for Iowa's system of public comprehensive community colleges was passed in 1965.[57] The Iowa legislature created educational systems that cover all regions of the state and address local community, business, and student needs. There are currently no freestanding vocational area schools or vocational high schools or institutes.[58]

There are 15 community college districts in Iowa, all offering arts and sciences (college transfer), vocational preparatory, and adult and continuing education programs. They are:

Des Moines Area Community College System;
Eastern Iowa Community College District, Davenport;
Hawkeye Community College, Waterloo;
Indian Hills Community College, Uttumwa/Centerville
Iowa Central Community College, Fort Dodge;
Iowa Lakes Community College, Estherville;
Iowa Valley Community College District, Marshalltown;
Iowa Western Community College, Council Bluffs;
Kirkwood Community College, Cedar Rapids;
Northeast Iowa Community College, Calmar;
Northwest Iowa Community College, Sheldon;
North Iowa Area Community College, Mason City;
Southeastern Community College, West Burlington;
Southwestern Community College, Creston; and
Western Iowa Tech Community College, Sioux City.

> *"Iowa's community colleges are dynamic and flexible institutions relatively young compared to other sectors of education and have proven themselves willing to embrace change to meet the ever evolving needs of their communities".*
>
> Jeremy Varner, *Forty Years of Growth and Achievement: A history of Iowa's Community College*s

In 1989, the Iowa legislature passed Senate File 449, legislation that required secondary vocational programs to articulate their competencies with postsecondary vocational education. This requirement began to expand the level of cooperation between local school systems and the community colleges.[59]

Community College Funding and Tuition

The Iowa Legislature approves an annual appropriation for community colleges. This amount is not generated by a per-pupil formula based on a student count. But in order to equitably distribute funds that are appropriated, in 1998 the Iowa Association of Community College Presidents (IACCP), the Iowa Association of Community College Trustees (IACCT), and the Iowa Department of Education collaborated to create a proposal for determining the distribution of appropriated funds from the State legislature to the state's 15 community colleges. The consensus approach designed in 1998 protects each school's share of state funding based on the college's previous year appropriation. If new funding is made available by the legislature, the new funding is run through a distribution formula that takes into account the school's previous state aid allocation share, an inflationary factor, and each school's

proportional share of enrollment among all community colleges in the State.[60] This consensus formula was put into Iowa Code 260c.18c in 2005.

Community colleges also access funding appropriated by the State Legislature for programs under the Workforce Development Funding (Iowa Code 260e/f and the Accelerated Career Education (ACE) Programs (Iowa Code 260g).[61]

Table 3 demonstrates how over the past several years, total funding per community college student dropped precipitously, while the number of students participating rose dramatically, and thus the combined funding available per student also dropped. During the last three years, state and local funding increases have recovered some of the lost ground. State appropriations are significantly higher than in FY 2002, but because there are almost 15,000 more participating students, the per pupil funding has not yet recovered to the FY 2002 level.

Table 3
Community College Funding Trends, Numbers, Property Taxes, State Funding, and Funding Per Pupil

Fiscal Year	Number of Pupils	Property Taxes	Taxes Per Pupil	State Funding	State Funding Per Pupil	Total Funding Per Pupil
FY 2002	64,404	$18,644,240	$289	$137,585,680	$2,136	$2,426
FY 2003	69,564	19,164,847	275	138,585,680	1,992	2,268
FY 2004	73,263	19, 610,211	268	136,127,396	1,858	2,126
FY 2005	77,288	19,079,634	247	139,779,244	1,809	2,055
FY 2006	77,288	19,548,820	253	149,579,244	1,935	2,188
FY 2007 (estimated)	79,381	20,528,558	259	159,579,244	2,010	2,269

SOURCE: Condition of Iowa community Colleges, 2006, Appendix J, Pages J-14 through J-19

One area of continued concern is a consistent increase in tuition and fees among community colleges within Iowa. In only four years between Fiscal Year 2001 and 2005, the percentage of total community college operating revenue that was covered by state general aid dropped from 46 percent to 36 percent, while the percentage coming from tuition and fees rose from 39 percent to 49 percent. While there was significant variation in the tuition and fees charged by individual colleges on the whole, the percentage of costs that must be covered by tuition and fees paid directly by the student was much higher for Iowans than the national average**.** According to the Chronicle for Higher Education, the national for community college tuition and fees was $1847. In Fiscal Year 2005, the average tuition at Iowa's community colleges was $2,876, about 55 percent above the national average. In recent years community college tuition in Iowa has been among the highest in the country[62]

Section IC. Information-gathering Group Issues

During the regional information-gathering meetings held by the Contractor in December 2006 and January 2007, a number of themes and perspectives came up on a routine basis. Not all of the views expressed by information-gathering group participants could be validated, and some of their perceptions may have been a misinterpretation of official state or local policies. Still, it is very valuable to understand the perspectives of these education stakeholders in making decisions about the future of CTE in Iowa.

Positive Progress with Career Academies

In several locations, Career Academies are emerging, which closely mirror the new requirements for "CTE Programs of Study" in the Perkins Act. These are programs that link CTE courses and academic courses at the high school into a series of coordinated courses offered by the community college and that ultimately lead to a postsecondary certificate or degree.

Strong Collaboration among High School and Community College Programs

In places where active community college and high school coordination was happening, participating teachers and administrators expressed a high level of satisfaction and cooperation. Teachers and faculty members often shared that they collaborated with their counterparts to review curriculum, coordinate professional development, share facilities and equipment, and introduce high school students to the college environment through joint activities. Collaboration between secondary and postsecondary was not consistent across all the regions that were visited, but where it existed, it was seen as a positive development.

Concern about Workforce Quality and Quantity

Business owners and government officials expressed consistent concern about the quantity and quality of the Iowa workforce, especially among younger workers. Many participants expressed concern about the attitudes and work values of youths, in addition to other concerns about the quality of academic preparation they possessed.

Effective Employer Engagement

Where employers had been engaged to support and participate in career academies and other postsecondary education efforts, these business leaders expressed strong satisfaction about the working relationships with the schools and colleges.

Lack of Information about the Perkins Act

Administrators, faculty and teachers across Iowa appear to have very little understanding of the current or previous provisions of the Perkins Act, such as accountability provisions and program improvement requirements. At the time of the regional meetings, four and five months after the Perkins Act of 2006 was enacted, local participants indicated they had not received any briefing materials about the new Act through the State Department of Education. The Perkins Act is perceived mostly as a mechanism to provide flexible CTE funds, rather than an effort to encourage and support program improvement.

Misunderstanding the Role of CTE in School Improvement

With a few exceptions, most school administrators, as well as CTE instructors and administrators, did not articulate a clear understanding of how CTE programs could be integrated into broader school reform and improvement efforts. Except for personnel involved in career academies, the potential of CTE to support high school redesign is a missed opportunity.

The Core Curriculum Requirement

The Iowa legislature enacted legislation requiring every school district to enact a core curriculum graduation requirement, and also directed the Department of Education to create a Model Core

Curriculum for use and adaptation by school districts. Among CTE faculty and administrators, there is concern that the core curriculum might squeeze CTE courses out of the school schedule given financial and scheduling constraints, particularly in the smaller school districts.

Lack of Informed College Enrollment Decisions

In many ways, because of State policy and innovative practices at the local level, Iowa is a national leader in offering postsecondary credit courses to high school students. Yet local education leaders indicate that most college credit enrollment occurs in a happenstance manner and that students do not choose their postsecondary enrollment courses in the context of a well-defined college and career plan.

Weak Career Awareness

Focus group members also expressed a profound concern about the lack of career awareness among most high school students, parents, and to a lesser degree, adult students in community colleges. In tandem with a lack of career awareness, focus group participants believed there is a strong educational culture fostered by school counselors, the State Department of Education, and parents that push Iowa students to consider four-year college and university studies as the only valid option leading to their future career success. There is a concern that community college programs, which often lead to careers with substantial earning power, are misunderstood and undervalued by the high school teachers, counselors and administrators.

Lack of Sufficient Academic Preparation

One theme that emerged consistently is the lack of preparation by adults, including many recent high school graduates, to perform college-level work. College faculty and administrators complained that some current high school students are not academically eligible for postsecondary enrollment courses, but that recent high school graduates must be admitted to the community college and allowed to take coursework, even when they are not academically prepared.

Department of Education Visibility and Leadership

While there was a high degree of respect and appreciation for some of the Department of Education consultants, there was also a sense that the Department of Education plays a responsive role rather than a pro-active role in providing vision and direction. Some participants indicated that more leadership and innovation is coming from the community colleges than from the State Department of Education.

CTE Teacher Recruitment and Retention

Focus group participants and state staff expressed concerns about the future of the CTE teaching force in Iowa. There are many retirements looming among current CTE teachers, and only a small pipeline of teaching prospects are currently enrolled in the State's university-based preparation programs. There was a degree of frustration expressed with the university-based programs, and that at some campuses the offerings for teacher recertification purposes were somewhat irrelevant. There was also a desire expressed that community colleges could play a more prominent role in preparation of teachers and in ongoing professional development. Several participants noted that the Area Education Agencies (AEA's) providing professional development services for the K-12 system do not offer any sustained focus on CTE professional development. Thus, much of the professional development that CTE teachers receive is very generic in nature (literacy, differentiated instruction, data analysis), and does not relate directly to CTE curriculum and instruction or integration of academic and technical skills, as called for in the Perkins Act. Participants also expressed challenges in recruiting CTE teachers from the business world, particularly in the rural areas.

Part II. Implications of the Carl D. Perkins Career and Technical Education Act of 2006

In summer 2006, the U.S. House of Representatives and U.S. Senate reached a compromise agreement and passed by overwhelming margins the "Carl D. Perkins Career and Technical Education Improvement Act of 2006."[63] On August 12, 2006, President George W. Bush signed the bill enacting it into law.

This new Perkins Act (referred to in this memo as "Perkins IV") is the result of a multi-year process in which Congress took action on legislation over the course of two sessions of Congress, while the Bush Administration offered a range of policy options during the same period. Some of the Bush Administration's early ideas, such as an emphasis on stronger local accountability and CTE programs of study that link secondary and postsecondary, were included in the final legislation, although the programs of study as suggested by the Administration were more narrowly defined and directive than what Congress included in the final law. Other ideas, such as allowing Perkins funds to be shifted into Title I of the *No Child Left Behind Act* (for services to disadvantaged students) or folding Perkins funding into a new high school reform block grant, were emphatically rejected by Congress.

In the end, the enacted legislation maintains a federal funding stream designated solely for Career and Technical Education programs, while building upon and strengthening the existing accountability system and activities to ease the transition of students from secondary into postsecondary education programs.

There are four significant changes to the new law that will have an impact on state and local recipients of Perkins funds: CTE Programs of Study, Accountability, Tech Prep, and Competitiveness. This memo provides an overview of those key changes in the law and a review of implications for state action.

Additional resources about the Perkins Act can be found at the websites for the Association for Career and Technical Education (ACTE) and the National Association of State Directors of Career and Technical Education consortia (NASDCTEc). Key documents from ACTE are attached to this memo, and links are included here:

ACTE: http://www.acteonline.org/policy/legislative_issues/Perkins-new.cfm
NASDCTEc: http://www.careertech.org/show/reauthorization

In the fall of 2006, ACTE and NASDCTEc co-sponsored three regional meetings in which most states sent planning teams to learn about Perkins IV and begin planning for their state plans. Hans Meeder of the Meeder Consulting Group, LLC participated in all three regional summits and has also been directly involved with a number of states in helping them develop plans for Perkins implementation. In 2007, the Office of Vocational and Adult Education at the U.S. Department of Education has conducted regional meetings on data quality, assessment of program indicators, and other pertinent issues relating to Perkins implementation. However, as of summer 2007, the U.S. Department of Education has provided relatively little official guidance on implementation of Perkins IV, other than state plan guidance and some non-regulatory advice on performance measurement issues.

This section reflects the concepts discussed and questions raised by several state planning teams in the regional summits and in direct state consultations.

Section IIA. Perkins IV Overview

Programs of Study

Under Perkins IV, states have the responsibility to create and/or recognize a series of CTE offerings called "CTE Programs of Study." These Programs of Study will be adopted by local recipients at high schools, regional CTE centers, and community colleges (and possibly four-year colleges and universities). In short, each Program of Study is a cohesive set of academic and technical content that seamlessly connects high school CTE courses with postsecondary programs (at both community college and four-year degree programs). The Program of Study is the entire sequence of content that spans secondary and postsecondary and leads to a recognized credential at the postsecondary level. Each local recipient of Perkins funds (school district or community/technical college) must offer the portion of at least one Program of Study that is appropriate to its students.

In Iowa, programs defined as Career Academies closely match the federal requirements for "CTE Programs of Study."

State and Local Accountability

Under Perkins IV, there is an accountability system that places parallel responsibilities on the U.S. Department of Education, the state agency (ies) responsible for administering the Perkins Act, and Local Recipients. States and Local Recipients (see note re: Eligible Recipient)[*] are held accountable for the achievement of students in a series of performance indicators. There are separate indicators set by the state for secondary and postsecondary education providers. Performance targets are established for each of the indicators at the state level, and then also by each Local Recipient, based on the state performance target. If the state or local recipient does not meet its performance target for any one of the indicators, it must create a plan of action to improve performance on that indicator. In concert with the state or local improvement plan, the federal or state government must provide technical assistance to help improve performance. Under certain circumstances, if a state or local recipient fails to make necessary improvement against the indicators, the federal government and state government is authorized (but not required) to implement various levels of sanctions.

Tech Prep

The Tech Prep program saw several major changes enacted in Perkins IV aimed at making the results of Tech Prep more measurable and more closely connecting Tech Prep activities with other CTE activities in the state. First, there is a specific definition of a Tech Prep student to allow for consistent measurement of Tech Prep results. There are also multiple new performance indicators that apply to Tech Prep students, in addition to the general performance indicators that apply to all CTE students. The state's Tech Prep plan must be closely integrated with the state's general CTE plan. And, if a state chooses to do so, it may merge Tech Prep funding into the general state grant program and therefore be relieved from the programmatic requirements of Tech Prep.

Economic and Personal Competitiveness

Several provisions in the new law, taken together, place the focus of CTE more squarely on preparation for careers that contribute to the economic competitiveness of the United States and on the competitiveness of individuals so they can enter careers that are characterized as high-wage, high-skilled or in high-demand. Each state is given considerable latitude in how to define and apply these provisions;

[*] In the Perkins Act, the term "Eligible Recipient" is used to designate local providers of CTE services who can legally administer Perkins Act funds. An Eligible Recipient can be a school system, charter school, community college, or regional technical school. In this memo, the term **Local Recipient** is used in place of the phrase Eligible Recipient.

but the Congressional intent is clear – to more closely align CTE with current and emerging job opportunities in sectors of the economy that are associated with regional and international competitiveness.

Section IIB. Implications and Options for States

Programs of Study

Under Perkins IV, each state must describe the CTE Programs of Study available within the state (Sec 122(c)(1)(A). The language of the Perkins Act indicates that the state will have several Programs of Study available for use within the state. Each Program of Study must meet the following criteria:

- Is offered to students (and their parents as appropriate) as an option when planning for and completing future coursework;
- Incorporates secondary education and postsecondary education elements;
- Includes coherent and rigorous content aligned with challenging academic standards and relevant career and technical content;
- Is offered in a coordinated, non-duplicative progression of courses that align secondary education with postsecondary education;
- The content will adequately prepare students to succeed in postsecondary education;
- May include the opportunity for secondary education students to participate in dual or concurrent enrollment programs or other ways to acquire postsecondary education credits; and
- Leads to an industry-recognized credential or certificate at the postsecondary level, or an associate or baccalaureate degree.

The next provision of the state plan, subparagraph 122(c)(1)(B), says the state must indicate how "in consultation with eligible recipients" (school districts, colleges, and regional CTE centers), the state will develop and implement the CTE Programs of Study.

There is not a hard and fast method specified for developing and implementing these Programs of Study. States will likely focus on laying out a sequence of courses, both academic and technical, that will compose each Program of Study. But to ensure greater consistency across districts and colleges, the states may also choose to implement a standards-setting process whereby they create mandatory or model content standards across a range of Programs of Study. States should strongly consider using the knowledge and skill statements and model Career Pathway templates offered by the States' Career Clusters Initiative as a starting point. (www.careerclusters.org).

The state could choose certain schools and colleges or an existing Tech Prep consortium to take the lead in developing and refining Programs of Study within a particular Career Cluster, particularly if the school or college has already developed a program that meets some of the Programs of Study criteria.

In implementing this provision, the state could insist that every Program of Study offered at the local level include state mandated content standards. Additionally the state could require use of designated technical skill assessments (either state developed or industry developed) to assure comparability and consistency of learning across regions of the state. In contrast, a state could be fairly lenient in implementation, allowing locally developed Programs of Study that vary considerably and only meet the minimum requirements of the statute.

While the Perkins Act requires that each local recipient offer at least one Program of Study, this is a minimal requirement. For many colleges and school districts, only requiring one Program of Study may not be sufficiently challenging.

Perkins IV also makes articulated credits and dual enrollment an optional component of the Program of Study. The state could go beyond the suggestive language of the Act and create a requirement that every Program of Study include articulated credit or opportunities for dual/concurrent enrollment.

The state must also indicate how it will make known information about the Programs of Study that are offered by Local Recipients (section 122 (c)(1)(E)). Thus, the state will need to develop a process for ensuring that information reaches students and/or parents to facilitate decision-making about the available Programs of Study, and also that schools and colleges know about the Programs of Study offered by other institutions within the region and across the state.

State and Local Accountability

Perkins IV also creates a more specific process for state and local accountability than in the 1998 Act. The performance indicators have changed somewhat, with separate indicators laid out for secondary and postsecondary systems, and all the indicators must meet a test of "validity and reliability."

The secondary academic and graduation indicators are now directly tied to those used by the states under the *No Child Left Behind Act*. Other indicators relate to getting a high school diploma, a GED, and advancing to postsecondary education, the military, or work, and participation and completion of "non-traditional" programs. The secondary indicators are (section 113(b)(2)):
"Student attainment of challenging academic content standards and student academic achievement standards, as adopted by a state in accordance with section 1111(b)(1) of the Elementary and Secondary Education Act of 1965 and measured by the state determined proficient levels on the academic assessments described in section 1111(b)(3) of such Act.

Student attainment of career and technical skill proficiencies, including student achievement on technical assessments, that are aligned with industry recognized standards, if available and appropriate.
Student rates of attainment of each of the following:

- A secondary school diploma.
- A General Education Development (GED) credential, or other state-recognized equivalent (including recognized alternative standards for individuals with disabilities).
- A proficiency credential, certificate, or degree, in conjunction with a secondary school diploma (if such credential, certificate, or degree is offered by the state in conjunction with a secondary school diploma).
- Student graduation rates (as described in section 111(b)(2)(C)(iv) of the Elementary and Secondary Education Act of 1965).
- Student placement in postsecondary education or advanced training, in military service, or in employment.
- Student participation in and completion of Career and Technical Education programs that lead to non-traditional fields."

For postsecondary education, the indicators remain similar to those in the 1998 law, except the academic indicator was dropped. The postsecondary indicators are:

- Student attainment of challenging career and technical skill proficiencies, including student achievement on technical assessments, that are aligned with industry recognized standards, if available and appropriate.
- Student attainment of an industry-recognized credential, a certificate, or a degree.
- Student retention in postsecondary education or transfer to a baccalaureate degree program.

- Student placement in military service or apprenticeship programs or placement or retention in employment, including placement in high-skill, high-wage, or high-demand occupations or professions.
- Student participation in, and completion of, Career and Technical Education programs that lead to non-traditional fields."

Using the indicators, the state will establish benchmarks and performance targets (in the law referred to as state or Local "levels of performance" and "adjusted levels of performance") for each of the indicators. The law authorizes each state to establish performance indicators within the parameters of the law, but requires the U.S. Department of Education and the state to "reach agreement" on the performance targets for each of the indicators.* Once the state has established its "Levels of Performance" in negotiation with the U.S. Department of Education, each Local Recipient will also establish performance targets, either using the state's performance targets or negotiating with the state to adopt different performance targets.

Under Perkins IV, the state and each Local Recipient will be responsible for achieving the performance target on each individual performance indicator. Under Perkins 1998, the U.S. Department of Education allowed states to "bundle" the results from the various indicators and create an aggregate performance index. If one indicator exceeded the performance target, that indicator could wash out the effects of another indicator in which the performance fell short of the target. Under Perkins IV, performance indicators cannot be bundled together. Rather, the state and the Local Recipient is accountable for its performance on each and every indicator.

If a district or college fails to reach a level of performance that is at least 90 percent of a particular performance target, that recipient must indicate how it will work to improve program performance in the future year. For example, if a performance target is set for 70 percent proficiency on an indicator, then the state or Local Recipient must reach at least 90 percent of the performance target, which would be a proficiency level of 63 percent (70% x 0.9). If the state or Local Recipient does not implement its program improvement agreement, if it fails to make any improvement in any of its indicators in one year, or if it fails to meet 90 percent of the same performance target for three years in a row, then the Local Recipient or state will be subject to sanctions.

Many participants have asked at what level the local accountability applies, and whether it applies to the site or the school district or college district. Under Perkins, the performance targets are set for the Local Recipient (the eligible recipient). So, if the school district is the Local Recipient on behalf of schools within the district, the performance targets would be set for the entire district. If the eligible recipient is a consortium of small school districts, then the performance targets are established for the entire consortium. While accountability targets apply to all CTE students served by the Local Recipient, performance improvement plans will need to be more specific in their focus. The Local Recipient will need to analyze its performance and determine if there are particular school sites or programs located at a site that are in particular need of improvement.

Additional Indicators and Related Data

States have the ability under Perkins IV to identify performance indicators in addition to those that are required as part of the state's CTE accountability system. However, if a state utilizes this option of identifying additional indicators, it would also have to establish benchmarks and performance targets for the additional indicators, and would then be accountable for reaching those targets. Because of these

* There is a possibility that the U.S. Department of Education will issue regulations that specify greater conformity among the states in how the performance indicators are developed and measured. As of January 5, 2007, the Department of Education has not clearly indicated its intent on whether or not it will create regulations for the Perkins Act.

additional requirements, it is unlikely that states will include additional indicators as part of their federal-state accountability system.

Still, there are data elements that could be useful for measuring program quality or to emphasize a certain policy direction established by the state. As mentioned in Section III, Maryland has measured and reported the percentage of CTE students who also earn the high school academic credits necessary for admission into the state's public colleges and universities. These students are known as "dual completers" because they complete the credit for a vocational diploma and a university admission diploma. As states attempt to break the historical disconnect between CTE programs and college preparatory studies, it might help to have school districts begin focusing on this measure of "dual completers" and to set targets for increasing the percentage of students meeting this criteria.

Other states have conducted analysis of pass rates on high school exit exams, and their data indicate that students with a CTE concentration pass the high school exit exam at a higher rate than the general student population. It might be useful to compare the performance of CTE concentrators on graduation tests, college placements tests, and high school graduation against the entire student population and also against students who took a set of college preparatory courses but no CTE courses. The CTE student population could be broken down by those who completed college admission courses and those who did not.

Other pertinent data that is not required in the Perkins Act include the number and percentage of CTE students who took articulated courses or dual/concurrent enrollment courses, the number and percentage of CTE students who participate in a CTE Program of Study, the number of advanced (articulated or dual/concurrent) credits that CTE and general students earn, and the actual number of advanced credits that were "cashed in" when CTE students and general students enroll in college.

Even if these data cannot be collected on a statewide basis using a student record data system, sampling studies on a limited basis using the expertise of university researchers in the state would be very useful to build a better understanding of the impact of CTE on high school achievement and transitions into postsecondary education and the workplace.

CTE Skill Attainment

For both secondary and postsecondary, the indicator about technical skills attainment under Perkins IV now includes a reference to the use of industry-based skill standards where they exist. The law (section 113(b)(A)(ii)) says each state must develop an indicator relating to "student attainment of career and technical skill proficiencies, including student achievement on technical assessments, that are aligned with industry-recognized standards, if available and appropriate."

Some have asked if the new law requires the use of industry-based assessments or vendor-provided assessments of technical skills. The indicator focuses on CTE skill proficiencies that are aligned with industry-recognized standards (if such industry-recognized standards are available). While technical assessments are mentioned in an inclusive fashion, they are not the exclusive means of measuring student attainment of technical skill proficiencies.

To meet the intent of the law, the state should identify CTE proficiencies that are meant to be attained in its CTE programs, and develop a means of assessing these proficiencies either through a cumulative assessment offered at the end of a sequence of courses, or on a course-by-course basis. This process must also meet validity and reliability standards, as required by Perkins IV.

While not required for every program, an industry-based or vendor-based assessment could be an integral part of the state's assessment and accountability system for CTE proficiency.

Tech Prep

Perkins IV places several new requirements on the Tech Prep program. First, the plan for Tech Prep implementation must be included in the state's general plan for CTE. This is intended to create a seamless delivery of services and to closely integrate the activities of the general state grant program with that of the Tech Prep consortia.

Secondly, Section 203(3) creates multiple performance indicators for the Tech Prep program that extend beyond the performance indicators that are required in the Basic state Grant Program. They are:

The number of secondary education Tech Prep students and postsecondary education Tech Prep students served.

The number and percent of secondary education Tech Prep students enrolled in the Tech Prep program who—

- enroll in postsecondary education;
- enroll in postsecondary education in the same field or major as the secondary education Tech Prep students were enrolled at the secondary level;
- complete a state or industry-recognized certification or licensure;
- successfully complete, as a secondary school student, courses that award postsecondary credit at the secondary level; and
- enroll in remedial mathematics, writing, or reading courses upon entering postsecondary education.

The number and percent of postsecondary education Tech Prep students who—

- are placed in a related field of employment not later than 12 months after graduation from the Tech Prep program;
- complete a state or industry-recognized certification or licensure;
- complete a 2-year degree or certificate program within the normal time for completion of such program; and
- complete a baccalaureate degree program within the normal time for completion of such program.

Many of these indicators make intuitive sense for measuring program effectiveness, but in terms of the current data systems that exist and the need for high quality data, it may be difficult and expensive to implement these data indicators in some states.

Under Perkins IV, each state also has authority to merge all or part of its Title II Tech Prep funds into the Title I Basic State Grant. If the state chooses to do this, then it is relieved of the responsibility to carry out the programmatic requirements associated with Tech Prep, including the new performance indicators established for Tech Prep.

Many states are considering the option of merging Title I and Title II funds, for a number of reasons, including wanting to create a single system of CTE delivery and that the new Tech Prep accountability data required may be difficult to collect. For states that do make this choice, opportunities still exist to utilize the strengths of the Tech Prep program and continue activities and programs that were part of the Tech Prep consortia.

There are some dangers, however, that could play out in a merger. If a merger of funds is carried out without careful attention to and articulation of the state's policy objectives, a great deal of value that resides in the Tech Prep system will be lost.

The pros and cons of merging Tech Prep with the Basic State Grant are laid out in a memo dated November 13, 2006 and titled "Perkins Act of 2006, Proposed Criteria for Merger of Basic State Grant and Tech Prep Systems" by the Meeder Consulting Group. This memo offers possible criteria for creating a regional partnership structure within the state Grant program to emulate some of the functions that are currently carried out under Tech Prep.

Economic and Personal Competitiveness

At the beginning of the Perkins Act (section 2) several purposes are listed that are similar to those included in previous versions of the Act. However, there are two new purposes added to Perkins IV that give indications about the role of CTE in the eyes of Congress.

One new purpose is "supporting partnerships among secondary schools, postsecondary institutions, baccalaureate degree granting institutions, area Career and Technical Education schools, local workforce investment boards, business and industry, and intermediaries."

In the past, the notion of partnerships between secondary and postsecondary institutions was mostly limited to the Tech Prep program, whereas under Perkins IV, the purpose clearly extends to all CTE activities. Further, the notion of partnership with postsecondary education is extended beyond just two-year associate degree programs and shorter term training. Baccalaureate degree programs are also referenced in the law and are portrayed as an appropriate outcome of secondary CTE programming.

The second new purpose is "providing individuals with opportunities throughout their lifetimes to develop, in conjunction with other education and training programs, the knowledge and skills needed to keep the United States competitive." In this purpose, Congress drew a careful balance helping individuals grow and advance in their areas of interest and aptitudes, but also making sure that available programs are focused on those that help keep the United States competitive. There is an unavoidable tension between individual interests and relevance to the job market in the educational institution's decisions about which programs to offer. In some CTE and job training programs, the pendulum may have swung too far to the side of individual interests; restoring a good balance may mean that more attention should be paid to ensuring the market relevance of programs that are offered.

Another related change is a revised definition of Career and Technical Education (section 3(5)). In previous versions of the law, there was a clause that restricted CTE to only apply to careers that did NOT require baccalaureate, masters or doctoral degrees. In Perkins IV, that restriction has been eliminated, so now CTE can be defined as preparation for careers that require bachelor's degrees or higher. While the definition of CTE has been broadened in the Perkins Act, the funding stream for funds has not been changed. Only secondary schools, regional CTE centers, and college programs offering a 2-year degree or less are actually eligible to receive Perkins funding.

There is also a state plan requirement (section 122(c)(4)) in which a state must describe its efforts to facilitate the transition of students enrolled in two-year college programs ("sub-baccalaureate") into the four-year college and university ("baccalaureate") programs. This further indicates the interest of Congress in ensuring that students continue to advance to high levels of education and professional preparation.

Taken together, these changes in purpose and definition mark a new chapter in the development of Career and Technical Education. For many CTE programs that are already aligned to baccalaureate programs and the needs of the workforce, these new purposes are already being fulfilled. But for programs that are more traditional in nature, these new purposes challenge long-held assumptions.

In the past (and the present as well), many CTE programs were aimed at preparation for mid-level and low-level jobs, many that did not require postsecondary education. The notion of Career Clusters as an organizing mechanism is to expose students to a wide range of occupations within an employment sector, including those that lead to management and leadership positions, as well as engineering and scientific pursuits.

Engineering, science and technology are considered the drivers of the "innovation economy." When the innovation sector is strong, it fuels opportunities in the service, construction, and retail sectors of the economy. But without an adequate focus on innovation and growth, all other sectors of the economy and job market will suffer.

So the new focus on international competitiveness and allowance for careers that require bachelor's degrees or higher indicates Congressional intent that CTE programs become more broadly focused, to include pathways to careers requiring higher skills and offering higher wage levels, and that contribute to economic competitiveness.

State and local leaders admit that some CTE courses have very little relevance to employment but stay in the school schedule because they are popular with students as a "fun" (easy) class, or because a long-tenured teacher is not willing to update the program. To implement Perkins IV, each state needs to develop criteria by which local programs can be evaluated and nudged so that a growing percentage of CTE programs have clear alignment with the current and emerging job market. A good first step is simply to have Local Recipients indicate how their current CTE offerings are related to current or emerging jobs, how they relate to the state's economic competitiveness, and how industry-based standards are being integrated into curriculum.

Other Notable Provisions

Length of Reauthorization and State Plan Options

The previous law was "authorized" to be in effect for a five year period from fiscal years 1999-2003. Even though the authorization of the 1998 Act expired in 2003, the appropriations committees in Congress continued to provide funding to states under the structure of the previous law for three additional years until the law was "reauthorized." Extending the life of expired federal programs through the funding (or appropriations) process is a common practice in Congress.

The new law is authorized to be in effect for six years, from fiscal years 2007-2012. To access funding under the new law, each state must submit a plan that explains how the state will take action to comply with the requirements of the new law. Under Perkins IV, states can either submit one six-year plan in April 2007, or submit a one-year transition plan in April 2007, and then a multi-year plan for the remaining five years in the spring of 2008. All states have prepared one-year transition plans for submittal in 2007.

Within-State Funding

The within-state funding allocation structure of Perkins IV is very similar to what was allowed in the previous Perkins Act. For example, states maintain their ability to use 5 percent of funds for State Administration (with a state match), and up to 10 percent of funds to State Leadership activities. These leadership activities have been, and may still be, used for projects that have applicability for statewide program improvement. If states use leadership funds to support "consultant" positions, they should ensure that the activities of the consultants are focused on clearly defined improvement strategies, and not generic program management.

The remaining 85 percent of the state's allocation is to be distributed to Local Recipients. Among this amount, an allowable 10 percent (or 8.5 percent of the state's total allocation) can be used for a "reserve fund" to benefit areas with high numbers or high percentages of CTE students or rural areas. Reserve funds can be allocated in a very flexible manner and with specific purposes in mind, but the recipients of funds must be "eligible recipients" (Local Recipients) which includes school systems and community colleges.

Professional Development and Teacher Recruiting and Retention

Perkins IV makes some significant changes to how professional development is offered within Career and Technical Education. One new provision (section 122 (c)(4)) of the state plan says that professional development must be "high quality, sustained, intensive, and focused on instruction, and increases the academic knowledge and understanding of industry standards, as appropriate, of career and technical education."

In this description, professional development activities must focus squarely on improving instruction. Other activities are also listed in the professional development section, such as building professional competence in the use of data and scientifically-based research, and improving parental and community involvement.

Activities that relate to helping teachers develop their skills in delivering instruction or training in a specific curriculum would meet this requirement, as would activities that strengthen a CTE teacher's competencies in academic knowledge or industry skill standards. For example, a CTE teacher might need to strengthen his or her mathematical skills or knowledge about writing and grammar to better integrate math or language arts into his or her teaching. A CTE teacher might also benefit from learning about new technology and trends within an industry to stay current with professional expectations in the field.

Section 124 (b)(3) provides a notable limitation on how the state may use its leadership funds relating to professional development activities. The new law says that State Leadership Funds must be used for professional development programs that are "high quality, sustained, intensive, and classroom-focused in order to have a positive and lasting impact on classroom instruction and the teacher's performance in the classroom, and **are not 1-day or short-term workshops or conferences**."

This limitation is meant to change the culture of professional development, so that activities for teachers are not thrown together in a slip-shod fashion. This will have an impact on the way state funds are used for conferences. In some cases, what previously was called professional development at the state level might better be identified as "technical assistance."

This limitation on state leadership funds does not directly limit local uses of funds for professional development, but the policy change should be noted. While short-duration training events may still have an appropriate place in a teacher's professional growth, it makes sense for every teacher to develop a personal development plan of some sort, demonstrating how short-duration training fits into a plan of ongoing professional growth. Even better would be the state or district that develops a set of identified competencies and knowledge for its teachers and structures personal plans around gaining or enhancing those competencies.

Recruitment and Retention

Another element of the state plan (Sec. 122 (c)(3)) indicates the state must have a plan for improving "the recruitment and retention of career and technical education teachers, faculty, and career guidance and academic counselors," as well as for improving "the transition to teaching from business and industry."

Building the future CTE teaching force may be the biggest challenge facing states, school districts and colleges. Many CTE teacher preparation programs at the university level face shrinking enrollments and some programs have already closed. A large percentage of the CTE teaching force is nearing retirement age. The challenge of replacing retiring teachers is even more pronounced in rural areas, and in general, jobs in the technical fields are more lucrative than those of their teaching counterparts. States must consider major shifts in their strategies for recruiting and retaining CTE teachers.

Options should include:

- significant restructuring of teacher preparation programs among colleges and universities so that CTE teacher preparation becomes a concentration within undergraduate programs rather than exist as a freestanding program;
- creating streamlined routes for recent college graduates from non-teaching programs or elementary teaching programs to enter CTE teaching;
- allowing community colleges to offer courses that meet state re-certification requirements for CTE teachers; and
- coordinating regional and statewide efforts to recruit professionals into CTE teaching so small districts do not have to fend for themselves in a highly competitive recruiting environment.

Implications of the Perkins Act

The Perkins Act of 2006 provides an important opportunity for Iowa and its CTE leaders to dramatically improve the quality of their CTE programs, strengthening accountability for results and drawing closer connections between secondary and postsecondary systems.

While Perkins IV provides significant flexibility to states in the use leadership funds, the ability to set aside funds for Local Recipients through the "reserve," and to restructure or merge Tech Prep into the basic state CTE grant, Iowa should view this flexibility as an opportunity to lead a program improvement agenda, not just an opportunity to maintain ongoing programs and staffing positions.

Part III. Notable CTE Practices

Introduction

The purpose of this section of the report is to share notable practices in the administration of Career and Technical Education (CTE) programs from five selected states. This will provide additional perspective and context for Iowa is determining its strategic direction for CTE. The following states, Kentucky, Maryland, New York, South Carolina and Virginia, were chosen because each has exemplary or innovative program improvement initiatives that are worth noting.

Information in this report is drawn from interviews with key staff leading Career and Technical Education within each state's department of education, as well as publicly available program guidance and marketing materials.

This report is not intended to be an exhaustive review of each state's CTE system, nor does it provide an endorsement of all of a state's efforts for leading and managing CTE. Even though a state may have a notable area of strength, it may well have other aspects of its system that are less than exemplary.

In each profile, we note activities in three key areas: Career Pathway Development and Implementation; Strengthening Program Quality; and Improving Student Outcomes and Seamless Transitions.

All the states profiled here have somewhat different governance structures, and some states have considerable amounts of state authority for establishing curriculum, content standards, and other program standards. While some of these states may have more direct authority than the Iowa Department of Education, there may be workable adaptations of these promising practices that are appropriate for Iowa's governance system and education precedents.

Notable Practices in Kentucky

Kentucky Career Pathway Development and Implementation

Career Clusters

The Kentucky Department of Education uses 14 Career Clusters which were implemented in the late 1990's. They are: Agriculture, Arts and Humanities, Business and Marketing, Communications, Construction, Education, Health Sciences, Human Services, Information Technology, Manufacturing, Public Service, Science and Mathematics, Social Sciences, and Transportation. Under these clusters, 57 career majors were identified and implemented in all Kentucky Technical schools and high schools in the state. The state website has a complete listing of all career clusters and their related majors [64]

Individual Learning Plan

The Kentucky Board of Education recently updated its policy requiring each district to implement an advising and guidance process to support the development and implementation of an Individual Learning Plan. The policy had been in place for a number of years, but implementation of the plans was not of consistent quality, according to state officials. Under the updated policy, the nature of the advising must demonstrate the close relationship between further education and career opportunities, rather than advising on either career OR college opportunities. The Individual Learning Plan must be readily

available to the student and parent and must be reviewed annually by the student, parent and school officials. In addition, the district must develop a method to evaluate the effectiveness and results of the ILP process, and the evaluation must include input from students, parents and school staff.

Technical Skills Assessments

Kentucky, during the early implementation of Perkins III, put a great deal of emphasis in developing assessments for most of the career programs. The state established standards for each of the 14 clusters and created assessments to measure student learning in the clusters. The system is known as KOSSA (Kentucky Occupational Skill Standards Assessments) and each assessment includes a multiple-choice and problem-based scenario. The assessments are directly related to the program standards and focus on occupational, employability and academic competencies. The internal development process was time- and labor-intensive, but much less costly than creating assessments with a contractor or buying off-the-shelf assessments.

Students who score a 70 percent or above on the assessment's two parts are awarded a Kentucky Occupational Skills Standards Certification signed by the Governor and the endorsing business/industry partner. All programs are required to participate in the assessment system, but qualified students (those who have completed 3 technical courses in a career major) are NOT required to take the assessment. This voluntary nature could allow low-performing students to avoid taking the assessment, and this would make local program performance seem higher than it really is. On a positive note, local programs ARE required to demonstrate an increasing percentage of students who are taking the assessment.

In 2006, the Office of Career and Technical Education's Secondary Initiatives Branch successfully piloted and delivered electronically the first end of course assessments for technical coursework.

Kentucky Strengthening Program Quality

Integrating Academic and Technical Skills

Kentucky has developed 10 "interdisciplinary courses" that allow students to meet requirements for academic courses by taking classes that carefully merge academic standards with career-oriented content. Two courses—computer aided drafting/geometry and construction geometry—are structured so they cover all 23 state standards for geometry. Other courses, such as agri-biology, agri-science, medical science, and nutritional and food science, offer credits toward the state's life science requirement. Business economics and consumer economics cover the state's standards for economics. [65]

During recent years since the integrated content standards were finalized, state leaders have been concerned about the relatively small scale of implementation of these courses. The current model of delivery anticipates two teachers – an academic teacher and a CTE teacher – being dedicated to each of the integrated classes. For many school systems, it is cost prohibitive to have two teachers working together to teach one class. But the interpretation of the *No Child Left Behind Act* Kentucky received from the U.S. Department of Education related to the Highly Qualified Teacher requirements indicated that a certified teacher with content specialization was required to deliver the core content of the academic lessons. To meet this requirement in a less costly way, Kentucky is developing a new approach for academic content delivery. The state is working with Kentucky Educational Television to develop a hybrid academic/CTE course in which the academic content is delivered by a master academic teacher via a video-recorded lesson. The CTE teacher would be trained in academic content and would be required to assist students, coaching and facilitating their acquisition of the academic content.

Increasing the Use of Contextual Teaching and Learning in Math Courses

Kentucky's Board of Education recently enacted new policy that requires every student in the graduating class of 2012 to create an individual learning plan which incorporates emphasis on career development and includes at least 22 credits. Of these credits, there will be three credits of mathematics, which include Algebra I, Geometry and Algebra II. The Department of Education is taking action to make sure that teachers of core academic subjects are equipped to teach this content in a way that can be more readily grasped by a wide range of students, many of whom would have not taken the more rigorous math courses prior to the enactment of the new policy.

Kentucky has engaged CORD, Inc. of Waco, Texas to work with 40 teachers of Algebra I and Geometry to help them incorporate applied/contextual lesson plans into the standard curriculum. Over the last 15 years, CORD has developed numerous lesson plans that incorporate career-related and contextual approaches that demonstrate to students the real-world applications of academic content. If the training proves successful and has a measurable impact on teaching practices and student performance, it will be expanded in coming years. CORD is offering on-site training, and will also provide on-line training in the use of the contextual lesson plans.

In addition, CORD is also working with 10 teachers of Algebra II to begin developing new contextualized lessons for Algebra II classes.

State Allowance of Integrated Approaches for All Content Areas

Kentucky's new board policy also indicates that a local board of education may "substitute an integrated, applied, interdisciplinary, technical/occupational course or higher level course for a required course if the alterative course provides rigorous content and addresses the same applicable components of…" the state's established content standards. If a local district does substitute an integrated academic/technical course, it must offer a rationale and detailed course description to be filed with the Department of Education.

Performance-based Flexibility vs. Seat-time

New Kentucky Board of Education policy addresses the historical approach of measuring student learning credit by a 120 hour requirement. The new policy gives flexibility to local boards of education to award high school credit either based on a standards-based Carnegie unit of at least 120 hours, or a standards-based performance-based credit, "regardless of the number of instructional hours in one subject." The local board must establish a "rigorous performance standards policy" that allows the student to demonstrate learning based on established content standards.

Kentucky Improving Student Outcomes and Seamless Transitions

Senior Year Technical Math

Kentucky is also developing a technical math course that could be taught to seniors who have already met the Algebra 1/Geometry/Algebra II sequence requirement. The technical math course would focus on the use of mathematical concepts and principles in applied workplace settings like manufacturing and transportation. The course would reinforce the students' readiness for college-level math as well as strengthen their ability to apply math concepts in the work setting.

Program Connections to 2- and 4-year Colleges

As part of the Tech Prep Initiative, 4 + 2 plans have been developed throughout the state with the Kentucky Community and Technical College System (KCTCS). These plans have been extended beyond the 2-year stage to include the universities in some areas of the state.

Kentucky has three specific statewide articulation agreements within its Career and Technical Education programs that allow students to earn up to three credits in a specific career occupational area at colleges within the state. Areas covered include: agriculture education, administration support services or information processing services, and child development.

Notable Practices in Maryland

Maryland Career Pathway Development and Implementation

Redefining the Mission of CTE

In 2003, a Maryland workgroup developed a new mission and guiding principles for CTE programs in Maryland. The Mission is stated as "Career and technology education programs are developed and implemented to increase the academic, career, and technical skills of students in order to prepare them for careers and further education." The key change in the new mission statement indicates that CTE programs are intended to prepare students for both careers AND further education, rather than preparation for careers OR further education.

Aligning CTE around Career Clusters

In keeping with the new mission of preparing students for careers AND college, Maryland has adopted 10 career clusters as the organizing structure for CTE programs in the state. Maryland is using the following clusters:

- Arts, Media, and Communication
- Business Management and Finance
- Consumer Services, Hospitality, and Tourism
- Construction and Development
- Environment, Agricultural, and Natural Resources Systems
- Health and Bioscience
- Human Resource Services
- Information Technology
- Manufacturing, Engineering, and Technology
- Transportation Technologies

Clarity of Process for Program Development and Amendment

In January 2006, Maryland published a set of "Policies and Procedures for the Development and Continuous Improvement of Career and Technology Education Programs." This document clearly explains a process for developing CTE programs, including new programs and existing programs that must undergo an annual review for continuous improvement opportunities. With the submission of each local plan, the local applicant must take action to revise the 20 percent of its programs that exhibit the lowest relative performance, using this program development process.

Leadership Funds for Targeted Program Adoption

Maryland has used some leadership funds from the Perkins Act (up to 10 percent of the state allocation) for the purpose of providing incentives to local applicants to focus on activities related to so-called "Fast Track" programs. "Fast Track" programs are affiliated with a national organization, and they have already been rigorously reviewed by State DoE staff and granted "Fast Track" status. This status allow for much faster state review and approval for starting new local programs.

In 2006, the State set aside $420,000 to make up to 24 grants to local applicants that wanted to implement any of the pre-approved "Fast Track" programs. Funds from the grant could be used for the following purposes: travel, consultant services (limited), substitute teacher fees or faculty stipends, materials and supplies for curriculum development and professional development; purchase of instructional equipment, and limited administrative costs.

The following programs have been granted "Fast Track" status by Maryland:

- Printing Technologies (PrintED) Administered by the Graphic Arts Education and Research Foundation (GAERF®)
- National Academy of Finance, Sponsored by the National Academy Foundation (NAF)
- National Academy of Hospitality and Tourism (NAF)
- National Academy of Information Technology (NAF)
- Food and Beverage Management (Pro-Start), Administered by the National Restaurant Association
- Culinary Arts, achieved through earning ACF certification, (American Culinary Federation)
- Construction Trades and Construction Maintenance, administered through the National center for Construction Education and Research (NCCER)
- Database Academy (Oracle Education)
- IT Networking Academy (Cisco)
- Automotive Technology (National Automotive Technicians Education Foundation, Inc, NATEF)
- Autobody/Collision Repair (NATEF)

Maryland Strengthening Program Quality

Clarity of Mission and Vision

Maryland created an attractive and detailed publication titled *Maryland Career Clusters: Restructuring Learning for Student Achievement in a Technologically Advanced, Global Society.* This document has been widely distributed for use in developing CTE pathway programs, creating small learning communities, and improving the quality of existing CTE programs. The career cluster frameworks and CTE pathway programs are integrated in the career development framework to encourage systemic implementation at the local level. The document is currently being updated to reflect the secondary and postsecondary partnership and will be released in its second edition.

Local Plan Guidance

In the local application process, the State of Maryland requires local applicants to make very explicit descriptions of how the Perkins funds will be used for local program improvement, not simply maintaining existing programs. The state added clarity and requirements beyond the minimum elements required in the 1988 Perkins Act. For example, the first element the local applicant must provide is a description of the "mission, vision and priorities for Career and Technology Education programs within your local school system, and how they will assist in achieving the performance levels within the Core Indicators of Performance."

Additional Indicators

The Perkins Act allows states to identify additional indicators. As one of the academic performance indicators, Maryland chose to focus on the percentage of CTE concentrators (students who took three or more CTE courses) who also took academic courses in high school that qualified them to meet the state's university entrance requirements. Over the course of several years, the percentage of "dual completers" –

those students who completed the University of Maryland system entrance requirements and completed a CTE pathway – has increased from 14 to 47 percent.

Clarity of Planning to Improve Performance

In the local application, the applicant is given clear instructions about what the performance indicators are and how to gather and report three years' worth of data to indicate the trend in performance. For each Core Indicator, the applicant is required to indicate why it did or did not achieve the performance objective. Next the applicant must provide a detailed description of its strategic objectives to improve performance on the indicator and what measurable outcomes will be used to assess progress in addressing the strategic objective. The narratives are then summarized in a chart form for easy reference and tracking.

Maryland Improving Student Outcomes and Seamless Transitions

Focusing Tech Prep Funding on Program Improvement and Priority Initiatives

In Maryland, Tech Prep funds are administered by the Maryland Department of Education (responsible for K-12 education). Maryland awards Tech Prep funding on a competitive basis. Each local application includes a Tech Prep plan and Tech Prep Incentive Grant plan. With funding of $1.6 million, the State awards up to 16 grants with the maximum for each local grant for an amount of $275,000 per consortium.

The Local Tech Prep plan portion of the application is for the purpose of supporting and improving current Tech Prep activities. This portion of the grant may not exceed $50,000.

The Local Plan portion of the award is judged on the following criteria, aimed at requiring the local consortium to engage in continuous review, analysis and improvement activities:

- Analysis of Local Career Cluster and Tech Prep Program Performance (30 pts)
- Identification of Consortium Goals (20 pts)
- Strategy Worksheets (focused on program improvement strategies)(20 pts)
- Evaluation and Management Plan (10 pts)
- Budget Narrative and Budget Form (20 pts)

The Maryland Tech Prep Incentive Grant (using funds derived from the WIA incentive grant) portion of the grant can be applied to fund any of the following special purposes included in the local application:

- New Tech Prep Program – Planning Phase (up to $5,000);
- New Tech Prep Program – Development Phase (up to $15,000 for each new pathway program) ;
- Project Lead the Way (PLTW) Site Development (Up to $40,000 in first year);
- Project Lead the Way (PLTW) Site Enhancement (for years 2 and 3, with cumulative total not to exceed $70,000);
- Gateway to Technology (GTT). This is a project-based program for grades 7-8 (up to $26,000 per school site);
- College and Career Preparation Services (up to $5,000); and
- Professional Development, related to various organizations and themes such as High Schools That Work, National Academy Foundation, League for Innovation, or other professional development opportunities (ranging from $1,000 to $4,600).

Articulation Program for Teaching from Associates Degree to Baccalaureate Degree

Approved in the fall of 2001, Maryland's Teacher Education Transfer Program A.A.T. (Associate of Arts in Teaching) is a unique degree option for students who want to become certified teachers. Students can

now begin their teacher preparation college studies at many Maryland Community Colleges. The AAT degree curriculum provides the first two years of a four-year bachelor's degree in teacher education at the community college and leads to Maryland teacher certification.

The Maryland Partnership for Teaching and Learning K-16 is an alliance of the Maryland State Department of Education, the Maryland Higher Education Commission and the University System of Maryland. In November 2002, the partnership established a working group to develop a new two-year Associate of Arts of Teaching degree, building on the Elementary Education Associate of Arts Teaching Degree.

Notable Practices in New York

New York has placed great emphasis on using the Regents Exams to drive educational improvement. To receive a state approved high school diploma, students must complete 22 units of credit and pass five required Regents examinations. CTE improvement strategies have been closely linked to the academic requirements for students to earn the diploma.

New York Career Pathway Development and Implementation

Under Perkins III, New York State DoED organized its Career and Technical Education Studies under somewhat traditional categories:

- Agriculture,
- Business and Marketing,
- Family and Consumer Sciences,
- Health Occupations,
- Trade and Technical, and
- Work-based Learning Programs.[*]

In each of these areas, the State has adopted model program standards that use the terminology of career clusters (or "career families") and career majors.

New York Strengthening Program Quality

The New York State Board of Education enacted the Career and Technical Education (CTE) Policy of 2001, which is designed to raise the academic and technical rigor of CTE programs, and also allow students a flexible pathway to graduation. The essence of the 2001 policy is a voluntary process for Program Approval.

Program Approval Status

New York has developed an interesting voluntary approach to helping students meet state graduation requirements while also participating in rigorous CTE coursework. Under the New York Board of Regents requirements, all students are required to pass five challenging "Regents" exams in order to graduate from high school. In addition, students are required to take three credits of math and three credits of science. This requirement poses a challenge for 11th and 12th graders who participate in CTE programs at one of the regional CTE centers, called BOCES (Boards of Cooperative Education Services) in New York.

[*] Work-based learning programs allow students enrolled in other CTE programs to apply their knowledge in a work-based setting.

Students who participate in BOCES programs take their academic courses at the home high school in the morning or afternoon, and spend the remainder of the day at the BOCES. Given the time taken in transportation to and from the BOCES center, students would have difficulty meeting the additional academic course-taking requirements. BOCES directors believed the new academic requirements would be a disincentive to voluntary student enrollment in CTE courses, so they asked the state to give them flexibility in helping students meeting the academic course requirements.

The State used this need to create a voluntary program approval process that would help upgrade the overall quality of CTE programs by establishing program standards for approval. When a school has earned an "approved status" then it is allowed to confer academic credit for integrated coursework that counts toward the 3rd unit math/science and or English/social studies.

The State indicates that students who participate in approved programs outperform the general student population in terms of passing the New York Regents exams and graduating from high school.

The key program elements of an Approved Program include:

- Cross walking the CTE curriculum to state and local skills standards and state learning standards;
- Work-based learning;
- Teacher certification;
- Articulation and dual enrollment must be offered;
- Technical certification assessment must be offered to the student; and
- Ability to offer a technical endorsement on the student's diploma.

The key to the academic credit is the working relationship between the academic teacher and the CTE teacher. Before the school year begins, an academic teacher that meets the Highly Qualified Teacher definition in the *No Child Left Behind Act* must confer closely with the CTE teacher, review and approve curriculum guidelines to ensure that the state's academic content standards will be addressed. The academic teacher must also validate the CTE teacher's ability to convey the academic content in the integrated course format. In essence, the academic teacher is acting as a supervising teacher to the CTE teacher regarding academic content, in the way a physician acts as a supervising agent to a nurse practitioner or a physician's assistant.

Each program is locally developed and there are no model programs that have already been designated with a "pre-approval" status by the State. Even if a local program is affiliated with a national organization or curriculum such as Pro-Start or Project Lead the Way, it must go through the standard state review and approval process. There is no specific time-frame guaranteed to local providers for State review and determination. Over 850 local programs have received approval status.

Industry-based Credentials

Another requirement of Approved Status relates to the use of industry-based credentials. First, to earn an approved status, teachers in the program must earn the relevant industry-based credential. Industry-based credentials are selected and approved by the district superintendent, and must meet certain quality criteria established by the State Department of Education. Further, the program must offer the student the opportunity to take an industry-based assessment that is related to the course of study.

For the student, if he or she takes and passes the technical assessment and completes the approved program, he or she will receive a technical endorsement on the Regents diploma. But there is no requirement for the student to take the industry-based assessment, since they can be very expensive and the State does not subsidize the cost of the assessments.

Interestingly, the Program Approval process is predominant among the BOCES, but according to an evaluation report issued by MAGI Educational Services (2005), the process appears to be largely non-existent among comprehensive high schools. The comprehensive high schools have no real incentive to improve their CTE programs, and the State seems to have no significant leverage for improving program quality.

According to state officials, they are beginning the process in 2006 of re-approving the first CTE programs that were processed under the 2001 Regents Policy on CTE. Programs must be re-approved after five years to assure that they continue to meet academic and industry standards.

New York CTE Resource Center

New York is working creatively to address the ongoing need for technical assistance and professional development to improve local program quality. During the 1990's the State faced severe budget cuts which reduced staffing at the Department of Education by about 50 percent. Although the State agency has flexible funding through the Leadership Funds in the Perkins Act, there is still a firm cap on inside hiring.

So, in order to build capacity that can provide technical assistance without expanding the number of state employees, the State DoED is using some of its Perkins leadership funds to create a new CTE resource center. The Center is operated under a five-year $3.6 million contract with the *Questar III BOCES*, and is intended to assist State staff in the delivery of technical assistance and staff development to programs that have failed to meet Perkins performance levels. Center staff is already working with schools to update curriculum and improve data collection.

Program Monitoring

Official State Policy is unclear about the focus of monitoring for program quality. It seems to limit state monitoring only to programs that are seeking or having gained approved program status.

In the local application package, each district is supposed to indicate improvement steps it will take if it fails to meet the state's performance standards on any of the performance indicators. The application package does not indicate any expectations of how or if improvement steps will be judged sufficient to bring about the change in performance necessary.

New York Improving Student Outcomes and Seamless Transitions

Nothing to Report

Notable Practices in South Carolina

South Carolina Career Pathway Development and Implementation

Consistent Communication Tools

For the past several years, South Carolina's education leadership has been creating a steady stream of policy reports and program documents that have clarified and shaped an emerging vision for career clusters and linking CTE with economic development.

As early as 1999, a number of working groups were convened that led to an early report titled "2020 Vision for Career and Technology Education in South Carolina."

In 2001, the Governor's Workforce Education Task Force issued a report titled "Pathways to Prosperity, Success for Every Student in the 21st Century Workplace." This report laid out the original themes of strong academics with real-world problem solving skills, the development of career clusters and character-related education. These themes became the centerpiece of key legislation in later years. The report was widely disseminated and a speaker's packet was developed to give business leaders tools for effective communication of the vision.

In 2002, an interim planning committee was convened to solicit public comment on the preliminary action plan related to the recommendations in the Pathways to Prosperity report.

As the career clusters concept advanced, a series of attractive and informational brochures targeted at youth were developed highlighting the 16 career clusters adopted in South Carolina. An accompanying guide "Making Career Clusters Work," served as a guide for South Carolina district administrators, principals, and teachers and was published in 2003.

Following passage of the Economic and Education Act of 2005, a detailed, readable and attractive orientation guide was released in 2006, "How EEDA Works For South Carolina."

Clarity in Legislation

In spring 2005, the South Carolina legislature passed the South Carolina Education and Economic Development Act (EEDA). Under this landmark legislation, the previous college-prep and Tech Prep tracks will be eliminated, and rigorous academic preparation based on the state's academic standards will be delivered in the context of student-selected "career majors." Every student will study "college prep" academics. Every student—with parent and counselor input—will develop an individual plan for graduation that will map out a course sequence for all four years of high school, assisted by electronic tools for career interest assessment and learning about career and related college options. Students will have the opportunity to compress their high school experience into three years and use their senior year for further career exploration and college-level work.

South Carolina Strengthening Program Quality

In South Carolina's state policies and procedures regarding CTE, there is a clear and consistent connection between key performance indicators and local improvement strategies.

Emphasizing Performance Standards

For secondary schools, there are five standards, based on the performance indicators required by the Perkins Vocational and Technical Education Act of 1998 (Perkins III). There are:

- **CATE (technical) skill proficiency**, defined as the percentage of students that achieve an average of at least 2.0 on grades for all CT courses taken;
- **Academic Achievement**, defined as the percentage of students that achieve an average of at least 2.0 on grade in mathematics, science and English language arts classes;
- **Graduation**, defined as the percentage of 12th grade students receiving a South Carolina High School Diploma;
- **Placement,** defined as the percentage of CATE completers who are available and are placed in postsecondary instruction, military service, or employment using the CTE competencies attained;
- **Nontraditional Participation**, defined as the percentage of students from the underrepresented gender enrolled in CATE courses identified as leading to nontraditional training and employment; and
- **Nontraditional Retention,** defined as the percentage of students from the underrepresented gender that complete CATE programs identified as leading to nontraditional employment.

Perkins IV does not allow South Carolina to continue using measurement approaches such as class Grade Point Averages. Still, despite the limitations of the indicators South Carolina used under Perkins III, its processes put improvement of achievement as a central focus in annual planning by local districts and career centers. Unlike some states, South Carolina began to make the critical connection between the program improvement purposes of the Perkins Act and the performance indicators themselves.

Targeting Improvement and Technical Assistance Around Perkins Standards

South Carolina explained its improvement processes in a document titled "State Improvement Plan." This document provides details about how student performance data are collected at the end of each school year and are analyzed by the State Office of Career and Technical Education for each school district and multi-district career center in regard to the six Perkins Standards. During the following fall, superintendents and career center directors are notified of the annual performance results and are given the opportunity to validate the data. Each local agency that does not meet one or more of the Perkins standards is required to initiate a local improvement process based on a tiered approach that allows for three levels of state technical assistance.

Targeting Levels of Need for Program Improvement

Points are assigned for the degree to which a Local Education Agency (LEA) or career center failed to meet the established performance goal on the Perkins Standards. If a performance goal was met or exceeded, the points awarded are zero. The higher number of points for each standard indicates how far short of the performance target the district fell. The points for each missed standard are added together, and an overall level of need for improvement is determined.

There are three levels of improvement. Level 1 means the highest degree of technical assistance is required, and LEA's in this category receive on-site assistant from the state in identifying program needs, and in designing and initiating a review process to determine specific areas that need improvement. Level 2 indicates that an LEA will be notified it needs to conduct a local review process to determine areas for improvement and to develop a local improvement plan. LEA's receive and must follow assistance provided by the state through its guidelines and recommendations, but on-site guidance is not provided by the State. Level 3 districts are notified that they should conduct a local review process, but the nature and scope of the review process are left to the discretion of the LEA.

An "OCTE Toolbox" developed in 2004 provides general recommendations for how a district can implement an in-depth review and improvement planning process.

Local Plan Focus on Perkins Standards

In the Local Plan document, the first section focuses on Nontraditional Standards, which the State identified as a priority for 2006-2007. Each applicant must, as the first item on the local plan, describe the specific activities/strategies planned to improve nontraditional participation and nontraditional retention.

Section B of the local plan requires a focus only on the Perkins Standards that were not met for 2005. For each performance standard that was not reached, the district must describe:

- The problem to be addressed;
- The specific action taken or planned;
- Dates for implementation; and
- The person responsible.

Unless other parts of local plans are being changed or updated, additional narrative in the annual plan update is not necessary. Thus, the annual plan process is entirely focused on key priorities established by the state (such as nontraditional participation and retention) and areas in which the local applicants failed to meet Perkins performance standards.

South Carolina Improving Student Outcomes and Seamless Transitions

Career Pathways that Span Secondary and Postsecondary Systems

The development of career pathways under the Education and Economic Development Act will create extensive opportunities for dual enrollment in CTE programs. The Act establishes a seamless education and career cluster pathway system that links PK–16. The clearly defined educational pathways for grades 9–16 provide agreements for dual enrollment and articulation for all courses and all career clusters.

Clarifying Expectations to Reduce Need for Remediation

In order to address high rates of remediation among recent high school graduates, there is a fledgling effort among college leaders to better identify college readiness criteria. Chief academic officers at South Carolina technical colleges led an initiative to identify competencies needed to prepare students for postsecondary course work in English, reading and mathematics and to redesign and make development courses consistent from campus to campus.[66]

Notable Practices in Virginia

Virginia Career Pathway Development and Implementation

Virginia has been identifying career roles and programs within the 16 Career Clusters for several years. State leaders have developed a *Career Planning Guide* that is student-centered toward careers and pathways in the 16 Clusters and identifies the courses/programs that a student needs to prepare within their career field of interest.

Virginia is also moving towards the organization of the CTE program area specialists around career clusters to complement the current classification of each curriculum around a specific cluster, and is promoting a statewide-available career assessment tool that presents results around the career clusters.

Virginia Strengthening Program Quality

CTE Resource Center

Since 1982, the Commonwealth of Virginia has supported the CTE Resource Center, administered by Henrico County Public Schools. The Center hosts meetings, provides library materials, distributes documents in print, and offers research data for educators across the state. The center also organizes and offers CTE resources in Virginia's Education Resource Center Online (VERSO). VERSO offers 121 complete instructional frameworks for use by Virginia educators, including links to collaborative lesson plans. A new feature for the center is live online assistance for educators using the database resources, so they can more easily find the resources they are seeking.

"All Aspects of Industry"

Virginia has created a resource list that expands upon the concept of "All Aspects of Industry" which is a key term in the Perkins Act. Virginia defines all aspects to include: Planning, Management, Finance, Principles of Technology/Technical and Production Skills: Labor Issues, Community Issues, Environmental, Health and Safety Issues.

Instructional Frameworks

Virginia has developed detailed instructional frameworks for 121 of its CTE programs. Each framework includes detailed and specific Task/Competency, Task Definition, and Process/Skill questions. Additionally, for each Task/Competency, a related Standards of Learning (Virginia's academic standards) is explained, references to competitive events in the relevant Career Technology Student Organization are listed, relevant components from All Aspects of Industry and reference to standards developed by national organizations affiliated with the instructional program are noted. State Board of Education regulations specify that local CTE programs must meet the criteria for state-established standards (8VAC20-120-110). Legally, these competencies are not considered "voluntary" or "model" competencies, they are mandatory for localities to follow. Local districts do have the authority to modify the competencies for students with disabilities who are covered by an Individualized Education Plan or a "Section 504 Plan."

Local General Advisory Councils

Virginia's regulations for CTE (8VAC20-120-50), issued by the State Board of Education, require that each local education agency or region establish a general Career and Technical Education advisory council to provide recommendations about current job needs and the relevancy of CTE programs. The purpose of the general council is not to advocate for or advise about a specific career cluster or occupational specialty, but to provide a broader perspective about the relevance and effectiveness of CTE programs offered within the local education agency or region.

Connection of CTE to General Accountability

In Virginia, CTE performance has been added to the School Performance Report Card. The number of students who receive a license/certification/occupational assessment is identified.

Virginia Improving Student Outcomes and Seamless Transitions

Path to Industry Certification

Growing concern about the economic future of high school graduates who choose to not pursue postsecondary studies led to the creation of Virginia's Path to Industry Certification program. Path to Industry Certification is designed to allow students to earn a high school diploma and complete technical

preparation at the high school and/or community college level that leads to a selected industry certification. The program is aimed at high school juniors or seniors who are on schedule to graduate with a standard or advanced studies diploma but are not planning to continue their education beyond high school and have not received an industry certification or state license. The certification training must be completed by May of the year following their high school graduation. The student, school counselor, and parent (if the student is a minor) sign a compact laying out the responsibilities of each party in the student's completion of the program. If the terms of the compact are met, then the program will pay tuition, applicable fees, textbook costs and certification exam fees. Over 60 industry-based certifications can be accessed through the Pathway program. [67]

Dual Enrollment and Articulation

According to the Education Commission of the States, "Since 1988 Virginia has offered formal dual enrollment programs. The Virginia Plan for Dual Enrollment outlines the program specifics. Courses must be part of a degree, certificate, or diploma program at a community college. Courses cannot be developmental, physical education or health. High school students must be recommended by their schools and meet community college admissions requirements. High school faculty teaching shared courses must have the same minimum credentials of community college faculty. The Virginia Plan also includes a section on assessment."

The Virginia Plan for Dual Enrollment was released in 2005 and provides a statewide framework for eligibility, admissions, course selection, award of credits, selection of faculty, tuition and fees, compliance with accreditation standards, and assessment. Courses are paid for by the student or school district, depending on the local arrangement, and students receive both secondary and postsecondary credit. Local dual enrollment arrangements can be formed in three ways:

- High school students may be enrolled in the regularly scheduled college credit courses with the other students taught at the community college.
- High school students may be enrolled in specially scheduled college credit courses conducted exclusively for high school students taught at the high school.
- High school students may be enrolled in specially scheduled college credit courses conducted exclusively for high school students taught at the community college. [68]

Statewide Articulation Agreements

In January of 2005, the State Board of Education approved a template for statewide articulation agreements for Career and Technical Education. This agreement was prompted by the 2004 Virginia General Assembly, which passed House Joint Resolution No. 125 requesting the Board of Education, State Board for Community Colleges, and the State Council of Higher Education for Virginia to develop the template. The agreement must include information on general and specific conditions, implementation, maintenance, assessment and data collection, and the signatures of all parties involved.[69]

One statewide CTE agreement, in information technology, allows student to earn up to 12 hours in community college credit upon enrollment after successfully completing high school coursework and industry certification.

The state has also developed the "Commonwealth College Course Collaborative" that helps to aid in dual enrollment and articulation programs by identifying a common set of subjects that allow Virginia students the chance to earn a semester's worth of college credit while in high school that will be accepted statewide. The collaborative is comprised of 13 credit hours that are accepted at all of the participating

institutions for degree credit. Students may earn as many as 20 additional degree credits at some schools.

Core Courses include Biology, Psychology, and U.S. History, and additional subjects include Art History, Economics, English, General Physics, Mathematics, and Music Appreciation. Every public college in Virginia participates (except VMI), as do the 24 undergraduate private institutions that make up the Council of Independent Colleges in Virginia, and 24 Community Colleges.

Tech Prep Career Pathways

The Virginia Community College System built on a national model definition of career pathways to establish a process for approving locally-developed Tech Prep career pathways. The career pathways must: have a written articulation agreement; include a sequence of academic and CTE courses beginning in 9th grade; and the career pathway must lead to a postsecondary credential, including an associate or baccalaureate degree or an industry certification or licensure. The postsecondary credential should be at a higher level than would typically be available at a secondary education level.

According to guidance provided to Tech Prep programs, it is expected that, in the future, Tech Prep students will be formally enrolled in Tech Prep Career Pathways using a statewide student registration system for Tech Prep students. [70]

Workplace Readiness

To ensure that CTE completers are ready for success in the workplace, Virginia has articulated standards for Workplace Readiness Skills. These standards are embedded in each of its career areas. Accompanying each skill is listed a standard for demonstrating the skill.[71] The skills are:

- Demonstrate reading skills on a level required for employment in a chosen career field.
- Demonstrate math skills on a level required for employment in a chosen career field.
- Demonstrate writing skills on a level required for employment in a chosen career field.
- Demonstrate speaking and listening skills on a level required for employment in a chosen career field.
- Demonstrate reasoning, problem-solving, and decision-making skills.
- Demonstrate understanding of the "big picture."
- Demonstrate a strong work ethic.
- Demonstrate a positive attitude.
- Demonstrate independence and initiative.
- Demonstrate self-presentation skills.
- Maintain satisfactory attendance.
- Participate as a team member to accomplish goals.

Part IV. Reengineering CTE for Iowa's Future

Career and Technical Education in Iowa is a critical asset for improving the competitiveness of Iowa's workforce. As CTE is recognized for its strengths in student engagement and real-world connections, it can help high schools become more relevant and meaningful, increase student graduation from high school, and help students make a seamless transition into postsecondary education and training with a more clearly defined career objective in mind. It can also support the up-skilling and retraining of adults already in the workforce.

The following Strategic Objectives are recommended with specific strategies and action steps. In the whole, they will:

- Increase the number of Iowans who make successful transitions into and through college CTE programs, leading to high-skill and high-wage employment;
- Create a world-class CTE system in Iowa;
- Integrate CTE with Iowa's high school improvement agenda;
- Connect Iowa CTE to the State's competitiveness agenda; and
- Build the quality and supply of Iowa's CTE teachers.

Strategic Objective 1: Increase successful transitions into and through college-level CTE programs.

Participation in and completion of college, at both the associate's degree and bachelor's degree levels is a key driver of Iowa's competitive economic position. It also pays important economic dividends to the individual who partakes of college-level work.

While Iowa has one of the nation's highest high school completion rates, there are still a significant number of recent high school graduates (38.5%) who do not enroll in college-level studies shortly after high school completion.

CTE programs of study, called Career Academies in Iowa, offer the most tangible strategy to attract more Iowan youths into and through college. In Career Academy programs, students see the immediate relevance of their classes to their personal interests, and better understand how academic and CTE courses connect to those interests. While students are not locked into a career choice because of the broad nature of the Career Academy program, they are given momentum in moving toward a college-level program that has purpose.

For adults too, high quality CTE programs offered through Iowa's community colleges provide the opportunity to grow and advance within a career field, or to enter a new field entirely. CTE programs at the high school and postsecondary levels, and the linkages between the two, are helping to build the quality and competitiveness of Iowa's workforce and secure the economic future of its people.

Strategy 1.1 Promote access to high-quality Career Academies for all Iowan youths.

Career Academies, as defined and implemented in Iowa, are programs of study available to high school students.* These programs include both rigorous academic courses and relevant CTE courses that introduce a student to learning in a particular Career Cluster and provide a planned and seamless transition into postsecondary education. As noted earlier in this report, programs offered under the Tech Prep program and those that have been designated as Career Academies in Iowa are essentially the same.

Iowa's leaders should ensure that high-quality Career Academies are widely available to all Iowa high school students by fall of 2010.

This is the central recommendation of this report because it directly relates to expanding opportunity for Iowa's youth – so the can meet and exceed the demands of the 21st century economy.

Since Career Academies offer challenging academic coursework, the career academy student who takes the requisite core curriculum courses should be better prepared to continue in the Career Academy program at the postsecondary level through the local community college partner, or to make a smooth transition into another postsecondary plan of study at the community college or university level. A high-quality Career Academy experience will also include a system of guidance and advisement, early assessments of a student's readiness for college-level academics, and instructional and academic supports to help students raise their academic achievement to meet college-readiness standards. With this "pre-mediation" approach, it is likely that Career Academy completers will have a better defined sense of purpose for postsecondary education, and require less academic remediation at the college-level.

As mentioned in Section I, Iowa is already a nationally-recognized innovator in the development of Career Academies that offer seamless transitions between high school and postsecondary education. Career Academy programs, such as those offered by Kirkwood Community College, Des Moines Area Community College, Iowa Western Community College and several others, already embody the ideals of new provisions that have been included in the Perkins Act.

By fall of 2008, the new Perkins Act requires every recipient of funds – school districts and community colleges – to offer one or more "CTE programs of study." Each CTE Program of Study must have rigorous academic content, relevant technical content, provide a non-duplicative sequence of courses between high school and postsecondary education, and lead to a postsecondary credential, industry-recognized certificate, or degree. If possible, the Program of Study should also offer college credit opportunities for the high school participants. The intent is to give every CTE student a clear pathway to college and high-skilled, high-wage, and high-demand employment.

There is no requirement that these activities be called "CTE programs of study" in day-to-day use, so it makes sense for Iowa to continue calling these efforts Career Academies.

* In many other states, a "career academy" is a sequence of career-themed courses offered within a high school setting, but does not include a direct partnership with a postsecondary institution or lead into a specific postsecondary program of study.

Iowa can build on its track record of innovation and excellence to exceed the minimal requirement of the Perkins Act of offering just one Career Academy per district or community college. Rather, Iowa's leaders should ensure that high-quality Career Academies are widely available to all Iowa high school students by fall of 2010.

This is the central recommendation of this report because it directly relates to expanding opportunity for Iowa's youth – so they can meet and exceed the demands of the 21st century economy. All other recommendations in this report are designed to build a system of excellent CTE curriculum, instructional delivery, and cross-system collaboration that will support maximum opportunity for the youths who represent Iowa's future.

Strategy 1.2 Create model Career Academy Plans of Study that help students make seamless transitions between high school and postsecondary studies.

Under the new Perkins Act, each State is required to take the lead in developing CTE programs of study that provide a rich educational experience that links high school and postsecondary education.

The States' Career Cluster Initiative has already created 81 model plans of study within the Career Clusters organizational approach for use and adaptation by States. These could serve as an excellent starting point for the work in Iowa in developing the model Career Academy Plans of Study.

Although the federal law does not mandate exactly how the State carries out its responsibilities, there is an unmistakable State role, at least in convening and building consensus among stakeholders and establishing minimum guidelines.

As Iowa reorganizes its CTE offerings around the Career Clusters (discussed in Strategy 2), the Iowa Department of Education needs to convene a statewide Career Academy Plans of Study Working Group to develop resources to support schools and colleges in meeting the new requirement. The working group should include personnel from colleges and school districts and business/employers.

The Career Academy Plans of Study (CAPOS) Task Force should develop a standardized template for Career Academy Plans of Study by December 2007, and make available to schools and colleges the 81 sample plans of study developed by the States' Career Clusters Initiative. By February 2008, the CAPOS Task Force should also create a web-based bank of sample plans of study based upon Career Academy programs already in existence in Iowa. These resources will help colleges and schools in their development of the first round of Career Academy programs that are to be in place by fall of 2008.

The Iowa Department of Education should also invite the Liaison Advisory Committee on Transfer Students (LACTS), which addresses articulation/transfer issues between community colleges and the Regents universities, to begin considering how Career Academies could feed into university-level programs. It should also be noted that, while no funding rules were modified, definitional changes in Perkins IV begin to reposition CTE as a program that can lead from high school directly to baccalaureate-level programs, not only to community college programs.

The LACTS should be asked to create a proposal for how CTE Programs of Study can be officially recognized by the Regents universities in the admission process, and whether CTE high school courses can be articulated to count for any college level credit.

Strategy 1.3 Reorganize Tech Prep activities so they are closely coordinated with Career Clusters/Pathways and Career Academy development.

Under the new Perkins Act, the State is required to closely coordinate Tech Prep activities with the general State Grant (title I) program, and is also allowed to merge Tech Prep funds partially or entirely into the State Grant program. A key feature that is included in Tech Prep, but is not specifically required in Title I of Perkins IV, is the concept of community colleges and school districts working collaboratively through a consortia agreement.

Some states that are folding Tech Prep into Title I of Perkins are replicating the consortia structure by requiring all colleges and school districts to participate in a regional consortium. In one state, each school district and college will be required to join a consortia in order to be eligible for its title I allocation and must submit its local application as part of the regional consortium plan.

However Iowa decides to proceed, either through merging Tech Prep funds or keeping them separate, state guidance and policy should ensure that all districts and community colleges are participating in a regional consortia approach, and that clear program outcomes are established for each consortium. Key indicators that are measured should be: increasing Career Academy enrollments, strengthening successful transitions from high school to postsecondary programs, improving academic preparation and reducing the need for college-level remediation, improving retention in postsecondary education, placement into high-quality employment, and customer (student, families, and employers) satisfaction.

Within Iowa, the IDE can designate Tech Prep funds or other funds to delegate responsibilities to some of the consortia for developing Career Academies/programs of study, curriculum development, assessment development, and professional development. These model programs and resources developed by the regional consortia can then be shared with other consortia throughout the State.

Strategy 1.4 Improve and extend guidance and counseling.

According to participants in information-gathering sessions across the state, for most students, teachers, and parents, there is still a strong belief that "you have to have a four-year degree to be successful" in the workplace and in life. Community college programs are viewed as a fallback option for students who cannot attend a four-year college or university.

On the whole, higher earnings are associated with bachelor's degrees than with associate's degrees; but there are many in-demand and well-paying jobs that require an associate's degree or a short-term certification. Furthermore, the findings from the University of Iowa cited in section I indicate there is a powerful earning boost associated with completing a community college CTE program. For many students, community college can be an excellent first choice, not just a fallback option.

Many schools and colleges already have available extensive tools and resources that can assist students in making informed choices about careers and related college studies. What may be lacking is a consistent school-based process for helping students learn about these options, reflect upon them, and to receive personalized mentoring or advisement. Information-gathering group participants often raised their concerns about a lack of focus and planning among Iowa's youths. There was almost unanimous consent that Iowa's youths needed one inter-connected process for career awareness and college planning.

The new requirement that all 8th graders develop a high school plan for completing the Academic Core and that this plan have a "career component" is an important opportunity to strengthen guidance and advisement for students.

Creation of the 8th grade plan is a good first step, but career development is not a one-time decision or activity. Ideally, a young people will interact with information about career options, and personal assessments of skills, aptitudes and interests on an ongoing basis. As noted, several states (like South Carolina and Nebraska) are making review of a personalized plan for high school graduation, career development and college planning something that happens about once a year, at a minimum.
Many high schools that undertake reforms to raise student achieve adopt a comprehensive guidance and advisement system as a key strategy. In this approach, teachers are trained and supported to take on an advisement role in interacting with a small number of students. The teacher advisors help students think about their career aspirations, understand the value of college-going, and help students create and implement a personal plan for their high school studies and studies beyond high school. The students and teacher meet on a regular basis, and student plans are updated on an annual basis.[72]

Iowa should consider strategies to help high schools implement guidance and advisement systems that feature these characteristics.

Strategy 1.5 Collaboratively develop model placement standards for community college CTE courses.

According to the Iowa Works campaign, "Iowa lags in portion of adults with any advanced degree beyond high school, from an associate degree upward (28.6 percent versus 30.7 percent)." [73]

In the May 2006 Model Core Curriculum report, Doug Becker, vice president of ACT, said that a rising number of US students need remedial courses once they arrive in college:

- 63 percent at public two-year colleges;
- 38 percent at public four-year colleges; and
- 17 percent at private four-year colleges.

According to the ACT analysis, while 77% of Iowa's students were "ready" in English, just 34% of the Iowans met science benchmark. Only 25% of Iowa's students taking the ACT met all for college readiness benchmarks in English, math, reading and science."[74]

On a national level, a very large percentage of first-time students require remediation, approximately 42 percent of first-time students at public two-year institutions.[75]

One issue that emerged in meeting with the information-gathering groups is the lack of consistency among community colleges for determining whether students are ready to engage in college-level work, and if not, should they be required or encouraged to participate in college-level remedial courses.

As Iowa works to strengthen the transitions of youths and adults in community college CTE programs, it would be useful to have greater consistency among the college in terms of their course placement and remediation policies.

Action steps to accomplish Strategic Objective 1

1. ***By 2010, require every school system to offer at least four Career Academy programs, in collaboration with other school districts, if necessary. Accompany this change by offering increased supplemental weighting for Career Academy courses, and allowing***

the Department of Education to waive other regulations relating to course offerings and faculty requirements as necessary to assist small and rurally- isolated schools in meeting this requirement.

2. *Ensure that at least one of these career academy programs available to all students is a pre-engineering program like Project Lead the Way or a similarly rigorous science or technology Career Academy program.*

3. *Convene Career Academy Planning teams, consisting of high school and community college faculty who are content experts, and business and industry advisors, to create a first phase of model Career Academy Plans of Study.*

4. *Provide information to schools and colleges about the 81 model Plans of Study, and indicate that schools and colleges should begin planning to offer at least one Career Academy beginning in fall of 2008.*

5. *Begin tracking student participation in Career Academies. Set annual goals for each district to increase the percentage of students participating in Career Academies, eventually reaching a statewide goal of 70 percent Career Academy participation among students who take three or more CTE classes.*

6. *Offer a two-tiered supplemental weighting to support schools offering Career Academy programs, and in increasing student participation in Career Academies. A 1.25 supplemental weighting would apply to all Career Academy courses (offered at the secondary level or in a shared format with postsecondary). A higher weighting of 1.48 would apply to Career Academy courses (secondary and shared with postsecondary) that the governor's office and the Department of Education have jointly designated as Economic Competitiveness priority programs, based on the region in which the program is offered. (Note: There would be no change or additional supplementary weighting for shared community college courses that are already eligible for the 1.48 weighting factor.*

7. *Require every eighth-grader to complete a web-based electronic career and college plan, using either Iowa Choices or another similar system. This system should link the Model Core academic courses with a career component. Require schools to update and validate the college and career plan at least annually.*

8. *Create state-level guidance about components of an effective guidance and advisement system, and make professional development opportunities available to school administrators and counseling staff for implementation of guidance and advisement systems.*

9. *Report on utilization of all electronic portfolios, including the Bridges system and other systems operated by local school districts and colleges, in order to get an accurate*

picture of overall utilization of career and college portfolios.

10. ***Update the Iowa Career Resource Guide on a regular basis, and upgrade graphics and print quality in future versions. The guide should also be converted from a document version to an online interactive format.***

11. ***Strongly encourage every local school district to join a Tech Prep consortium for the purpose of coordinating the offering of Career Academies. The State should consider making eligibility for Perkins title I funding contingent on joining a Tech Prep/Career Academy consortium.***

12. ***Convene a Department of Education/Board of Regents information-gathering group to investigate how CTE program standards can be aligned to college and university expectations, and how CTE coursework could be recognized at the college and university level. Invite community college officials, governor's staff and legislative staff to participate as observers when the group's work has progressed.***

13. ***Convene a working group among all community colleges to create model placement standards for each CTE course, building upon the current common course numbering system. This will allow prospective adult students and high school students involved in Career Academy programs to know what level of academic preparation is necessary for postsecondary success in each CTE program area.***

Strategic Objective 2: Create a World Class CTE System for Iowa

Over several decades, Iowa has accumulated a variety of organizational structures and policies relating to CTE, many of which reflect traditional models from the past that are not aligned with today's demands. Furthermore, as the demands of the workplace evolve, curriculum and assessment of learning must also change. A key strategy discussed in this report is strengthening Iowa's CTE curriculum. This will involve updating the CTE curriculum with current expectations for college and work-readiness, closely integrating the CTE curriculum standards with Iowa's model content standards for academic performance, and aligning CTE programs with the new Career Clusters national model.

Strategy 2.1 Adopt the Career Clusters model and connect to targeted industry clusters

A significant challenge facing Iowa is lingering confusion about the best way to organize Iowa's Career and Technical Education system. Over two decades, a variety of organizational approaches have emerged that have used similar terminology and carried out similar purposes. They are: career clusters, Iowa career pathways, traditional service areas, and targeted industry clusters. This report will briefly describe each of the organizational systems and make a recommendation for future organization. The following is a brief overview of various systems used by Career and Technical educators in Iowa today. More detail can be found in the High School Report, 2007.

National Career Clusters Model (also known as States' Career Clusters Initiative)

The National Career Clusters Model provides a way for schools to organize instruction and student experiences around 16 broad categories that together encompass all occupations from entry-level through professional levels. Career clusters can be divided into smaller categories of more than 81 career pathways that each serve as the foundation for numerous career specialties. This organizational system was originally proposed and partially funded by the U.S. Department of Education in a project carried out by a coalition of state departments of education. When federal funding ended, the project was continued with state funding, and thus adopted the name – *States' Career Clusters Initiative.* Iowa participated in this project, and was co-lead developer of the Cluster knowledge and skill statements for the *Agriculture, Food, and Natural Sciences* cluster.

Some states have chosen to submerge the 16 career clusters into six "Career Fields" or "super-clusters", mostly in order to preserve some semblance of the previous delivery mode for Career and Technical Education. Other states have adopted the 16 national clusters or adapted the national cluster model by combining and reconfiguring the clusters in some fashion.

It is not expected that schools or colleges would offer programs in all of the 16 clusters. More realistically, a large district or college might offer programs that fall within 8 to 10 of the clusters, and smaller schools and colleges might offer programs within three to five clusters.

Even though the breadth and depth of local program offerings might be limited by resources, using the career clusters model can be used as an organizational and planning tool to help students understand the world of work, and to link career interests with college planning. The clusters model helps a student see the career context in all of education, rather than being bound to thinking about careers only for the few CTE programs that might be offered in the student's school district.

Traditional Service Areas

Iowa code, Section 256.11(5)(h), organizes high school and community college Career and Technical Education (vocational technical education) into six service areas. These six areas are: agri-science and natural resources (agriculture education); business and information technology (business and office education); engineering and industrial technology (industrial education); health sciences (health occupations education); family and consumer sciences (home economics education); and marketing (marketing education). The six service areas represent a traditional organizational approach for Career and Technical Education that was replicated across United States during the 1950s and 1960s.

Iowa Career Pathways

Iowa code, Section 256.38, offers a set of six broad career areas developed in the 1990s by the Iowa School-to-Work Office and the Iowa Association of Business and Industry. These are also sometimes referred to as career fields or as Iowa Career Clusters. These career pathways were created and adopted prior to development of the States' Career Clusters Initiative, but serve a similar purpose. The six career pathways are: business and natural resources; arts and communications; family, consumer, and human services; health sciences; and engineering, industrial, and technology services.

Targeted Industry Clusters

The Iowa Department for Economic Development is supporting work in three targeted industry clusters because of their potential for growth in the creation of high paying jobs for Iowans. These industry clusters consist of business enterprises and business organizations that are bound together by

buyer/supplier relationships, common technologies, common buyer and distribution channels, and common labor pools.

Iowa's three targeted industry clusters are:

- *Life Sciences* (including production agriculture, value added processing, pharmaceuticals, and biotechnology);
- *Advanced Manufacturing* (involving the rapid introduction of new processes including metal manufacturing and heavy metal in the machinery manufacturing); and
- *Information Solutions* (including financial services and information solutions).

Industry clusters can be readily matched with individual subsets of the 16 Career Clusters. For example, the life sciences industry cluster would consist of subsets of the agriculture, food, and natural resources cluster, the science, technology, engineering and mathematics cluster, and other career clusters.

In early 2007, the Department of Education convened a working group, the "CTE Career Clusters Framework Study Group," to submit recommendations in the summer of 2007 for Iowa's CTE system should be organized. Iowa is ready to significantly update its CTE structure in a way that will allow these programs to be more easily integrated and coordinated with high school reform, workforce development and economic development. The State should adopt a streamlined career cluster organizational structure, to update its related codes and regulations so there is no confusion about the new structure, and align its efforts in advancing Career Academies to the career cluster structure.

Strategy 2.2 Revise and validate all CTE content standards around current industry standards.

Iowa's CTE content standards for the existing six program areas were developed in the mid-1990s. Just as most first-generation content standards for academic areas were deemed to be lacking – too general for use by the average teacher – many of the 1990's CTE content standards are also very broad and general in nature. They do not provide much detail about exactly what needs to be taught, nor how a teacher could build those content standards into a curriculum. In addition to the curriculum challenge is the assessment challenge. Program standards that are vague do not give teachers and assessment developers enough guidance about how to determine whether a student is demonstrating a level of performance that indicates college- and/or work-readiness. The next generation of CTE content standards needs to be much more specific, so that curriculum and assessments can be closely aligned to the standards.

Some States around the nation are already engaged in developing new CTE content standards, organized around Career Clusters and using similar methodologies to what is already been done with grade specific academic standards. Georgia is using the Georgia Performance System model, developed for its well-regarded academic content standards, and adopting standards that align with the Career Clusters model adopted by the state. Within the Career Clusters, Georgia identified 49 pathways that it will develop in CTE for implementation throughout the state. In a phased approach, the Georgia Department of Education has convened school administrators, teachers, and business leaders to develop the knowledge and skill statements related to each of the pathways. It is also drawing upon work done by the national Career Clusters model, which identified knowledge and skill statements for each of the Clusters and its related career pathways. These statements of knowledge and skills are being carefully validated and upgraded for state use. Other states like Maryland and California have already created very specific content standard statements that can be used as a starting point for the work in Iowa.

The new Perkins Act creates a more stringent requirement for how technical skill attainment is measured. The State must develop a method of measurement that meets a minimum quality standard, and that

measures the career-related skills and knowledge that have been identified as necessary by business and industry. The measurement approach should include industry-based assessments, such as Cisco certification or the National Institute for Automotive Service Excellence (ASE) automotive certification, where it is feasible to use such a certification.

This technical skills attainment requirement cannot be accomplished unless serious work around identifying CTE content standards is carried out – soon.

In previous years, many states, including Iowa, used course completion as a general proxy for technical skill attainment. Some states applied a standardized test that measures a broad set of employability skills (ACT's WorkKeys ™ or a state-developed instrument) to meet the Technical Skill Attainment accountability measure. But the new law is quite clear that the assessment must be linked to industry-based standards if they are available; a test of general employability skills does not seem sufficient for the requirement.

The use of industry-based assessments is actually quite difficult because in many cases, the assessment must be taken at a separate facility and then the results legally belong to the student, not the school system or the college. Thus, it is difficult for the school or college to obtain the test scores and feed the results into its accountability data system. For over five years, Texas has been using certifications and licensures where it can in its CTE programs, but according to state CTE leaders, only about 15 percent of CTE students are covered by such assessments. Georgia is considering asking a contractor to develop "end of pathway" standardized assessments. These assessments will be the property of the state like other statewide standardized assessments.

For any approach toward assessing the attainment of technical skills, a set of clear and specific content standards with specific performance objectives is the basis for effective assessment and instruction. By defining how students can demonstrate the degree to which they have mastered the standards, and giving teachers tools and training for how to measure this, classroom-based assessments can become the foundation of the technical skill attainment measure, supplemented with externally-developed, industry-based assessments, where available.

Strategy 2.3 Update related Iowa code and regulations and provide more flexibility in their application.

Related to the traditional service areas, Iowa's codes and regulations are linked to previous versions of the Perkins Act, and are out of sync with terminology in the new Perkins Act and the Career Clusters model. Other regulations need to be modified or clarified to give more flexibility so that Iowa's CTE programs and services can adapt to the changing learning needs of Iowa's students.

Outdated Terminology

For example, the school accreditation standards in Iowa code Section 256.11 5(h) describe the specific requirements relating to vocational course offerings:

> h. "a minimum of three sequential units in at least four of the following six vocational service areas: agriculture, business or office occupations, health occupations, family and consumer sciences or home economics occupations, and industrial technology or trade and industrial education, and marketing education….

Section 258.1 is another example of numerous sections in the Iowa Code that use outdated terminology, such as "home economics,""commercial subjects," and "vocational education." Section 258.3A and section 258.4 refer to standards and activities such as "agricultural, industrial, and commercial subjects and home economics." Section 258.4 refers to cooperation with "a federal board for vocational education and administration of the act of Congress." A federal board no longer exists to administer the Perkins Act.

Delivery of ICN and Virtual Learning Courses

According to comments by participants in the information-gathering sessions, the ICN has a difficult barrier to its more widespread use, in that ICN courses are delivered live with an instructor based in one site, with students based in other sites. Since school districts and colleges have different daily schedules and different semester schedules, it is not a simple matter to coordinate the participation of multiple schools and colleges. Discussants said the technology was better suited for professional development and distance meetings for teachers and faculty, rather than as a learning platform for students.

Online learning (that is asynchronous) seems to be a more useful instructional solution. For students participating in lab-based CTE courses, web-based academic courses could be a helpful solution to scheduling challenges. When students have to travel between 30 minutes to an hour each way to participate in a regional CTE program or community college program, the remaining time available during a traditional school day is very limited. But online learning is not limited to traditional school hours, and is also more easily accessible during summer months.

Section 256.7 lays out rules for telecommunications delivery of CTE programs. Rule 80 indicates that "rules adopted under this section shall provide that telecommunications should not be used by a school district as the exclusive means to provide any course, which is required by the minimum educational standards for accreditation."

This rule seems to prohibit the use of distance learning (either ICN or online learning) for delivery of courses that are required for accreditation. This would apply to core academic classes, as well as the minimum number of CTE courses required to be offered by the school district.

While not all CTE courses are conducive to online learning because of the necessary lab component, for academic classes, virtual learning abounds. Many states offer "virtual high school programs" where a student can take an entire high school curriculum online. The Florida Virtual High School is very visible among state sponsored sites. There are also commercial curricula available that are accessed within the home school community. At the postsecondary level, students regularly engage in a mix of live and online courses, accessed during the same semester.

Some states are encouraging online learning as a core learning tool for all students in the 21st century. In fact, Michigan has recently created a new graduation requirement so that every high school student must take at least one online course while in high school.

If Iowa could make online learning more readily available to high school students, particularly to fulfill some of core academic requirements, students could have more flexible school days to participate in lab-based CTE programs as well as internships and work-based learning opportunities.

Flexibility in Offering Minimum Number of Courses

School accreditation standards in Iowa Code Section 256.11 5(h) describe the specific requirements relating to vocational course offerings, that each accredited school must offer:

> h. "a minimum of **three sequential units in at least four of the following six vocational service areas:** agriculture, business or office occupations, health occupations, family and consumer sciences or home economics occupations, and industrial technology or trade and industrial education, and marketing education…."

During the information-gathering sessions, there were a variety of feelings expressed about this provision. In general, some felt that the provision was necessary to maintain a minimum offering of CTE courses within the school, and that having the courses offered at the high school campus was indispensable in overcoming the natural hesitancy of some students. Others expressed the opinion that the "offered and taught" requirement was simply an unrealistic burden for small districts.

Some school leaders indicated they had entered into 28E agreements where a partner community college would hire instructors to provide the CTE instruction to their students, either on district premises or at community college facilities. This strategy was very helpful in cases where the school district could not afford to hire or could not find a qualified teacher to hire.

While the minimum program offering requirement can be met through establishing a 28E agreement with another district or college, *most administrators and teachers that participated in the information-gathering sessions did not seem to be aware of this option.* The general perception was that the accreditation requirement was hard and fast, requiring CTE courses to be "offered and taught" exclusively by school district employees on school district premises.

To fulfill the recommendation from Strategy 1.1 that all students have access to four high-quality Career Academy programs, it will be necessary for districts and colleges to increase their collaboration in offering a range of CTE courses. The IDE needs to provide clear and visible guidance to district and college leaders about the flexibility at their disposal through 28E agreements, and how to apply it for increased collaboration.

Strategy 2.4 Align services for promising practices in serving special populations.

One of the purposes of the Perkins Act is to help CTE students, including students from special populations, to graduate from high school and advance to further education and successful employment. A particularly significant change in Perkins IV makes providing services to special populations a required use of local funds for eligible recipients. These services are meant to prepare special populations, including single parents and displaced homemakers who are enrolled in CTE programs, for high-skill, high-wage, or high-demand occupations that will lead to economic self-sufficiency.

The Perkins Act identifies the following students as "special populations:"

- Individuals with disabilities;
- Individuals from economically disadvantaged families, including foster children;
- Individuals preparing for non-traditional fields,
- Single parents, including single pregnant women;
- Displaced homemakers; and
- Individuals with limited English proficiency.

Given that "special populations" covers a very broad set of barriers and needs, there is a renewed urgency to discover the practices that show the most promise for improving student performance and close achievement gaps for CTE students who are members of special populations. Given the requirements of the *No Child Left Behind Act* and the *Individuals with Disabilities Act*, schools have already been engaged

in searching out promising practices to better serve these students. Lessons learned in general school reform should also be applied to CTE instruction.

In this discussion, a "proven practice" or "best practice" would be an education intervention that has clearly demonstrated effectiveness based on well designed research studies.
A "promising practice" would be an education intervention or activity that, based on a small sampling of program data, shows promise in improving outcomes such as student achievement, student retention and program completion, and student transitions; and an "emerging practice" would be a new innovation that has not yet demonstrated outcomes. It is important that educators adopt a common parlance for proven, promising and emerging practices so that it is clear whether or not a featured program has any demonstrated positive outcomes.

One of the most valuable roles for the Iowa Department of Education is to provide leadership to assist school districts and community colleges in gathering and sharing information about proven, promising and emerging practices for special populations. The IDE should work with educators and administrators in the state to identify the schools and colleges that are implementing practices in the following areas, and determine what criteria will be applied to designate a program as proven, promising or emerging. Using state and local resources, the IDE could encourage the development of a peer mentoring approach, where schools and colleges share their areas of expertise with other schools and colleges and assist with implementation of the promising strategies.

The following strategies should be examined through the initiative on special populations:

- How Career Academy Plans of Study can be customized to identify supportive services and additional opportunities from which special populations students will benefit;
- How Career Academy Plans of Study can be adapted and offered to adult learners, particularly those who are part of special populations;
- How information about Career Academy Plans of Study and other CTE programs can be targeted in career counseling for special populations students;
- How academic assessments, career interest inventories, and information about local and regional employment outlook can be integrated into career and admissions counseling for special populations students;
- How regular support group meetings for special populations students can assist with retention;
- How marketing resources can be targeted to special populations in advertisements, catalogues and course listings;
- How professional development can be offered to teachers and faculty to help them effectively work with and teach special populations students;
- How all school and college counselors can provide more effective counseling and guidance for special populations students;
- How financial aid and scholarship information can be made available to special populations students, including those who are economically disadvantaged, so they can understand opportunities for financing postsecondary education;
- How financial literacy/money management training can be provided for students, especially those receiving financial aid and who are economically disadvantaged or face other barriers;
- How information about additional scholarship funds can be made more readily available and/or targeted to special populations students;
- How information from national organizations (i.e. The National Alliance for Partnerships in Equity, Inc. (NAPE) and Women Work! The National Network for Women's Employment) can inform practices and policies in Iowa;

- How outreach and recruiting activities for students in special populations can be better coordinated between secondary schools and two-year postsecondary institutions, particularly with respect to federal student record privacy concerns;
- How career planning orientation, assessment, life skills and job readiness workshops, small group meetings, counseling, and tutoring services for special populations can be integrated into CTE programs that provide challenging academic content and relevant CTE content; and
- How materials about Career Academies and other relevant resources and counseling can be provided to students with limited English Proficiency, addressing language barriers.

Iowa is one of the most rural states in the nation with a large number of very small schools. Over one third of Iowa school districts have between 500 and 1000 students. On average these districts have between 38 and 77 students per grade. The smallest school district in FY 2007 (Lineville-Clio) enrolled 86 students, and the largest district (Des Moines) enrolled 31,549 students with an average of 2,427 students per grade.[76] There is an ongoing shift of population within Iowa from smaller communities to a few population centers in the State.

With its supplemental weighting for college enrollment courses and the 28E agreement authority, Iowa has created innovative policies that foster collaboration and sharing of resources. However, there are still a range of policies that have emerged over several years that may be inhibiting maximum use and sharing of resources between various systems.

Iowa policymakers should continue working to provide the highest possible quality of educational opportunities available to every student, regardless of their geographic location in the State. With this objective, more resources are needed, and policies must be sufficiently flexible.

Action steps to accomplish Strategic Objective 2

1. ***Adopt the 16 Career Clusters as Iowa's organizational tool to link education and workforce development. Eliminate references to the Iowa Career Pathways and the Iowa Service Areas from State codes and regulations. Maintain references to and connections with targeted industry clusters, since they can complement the Career Clusters model.***

2. ***Launch a CTE curriculum review process, working with teams of teachers and content specialists, to develop model content standards for each the CTE courses offered with the Career Clusters framework. The model content standards should indicate how to identify performance that is advanced, proficient, or below proficient, and will serve as the basis for a technical skill measurement system.***

3. ***In fall of 2007, convene a CTE Skill Assessment task force to create an assessment framework for how content standards will be assessed with consistency in each CTE course through an end-of-course assessment that is embedded into the course, how model assessments will be developed for each approved CTE course, how teachers will be trained in the use of assessments, and how data will be gathered from teachers and entered into the state's CTE accountability data system.***

4. ***Update various regulations and policies to be more conducive to a flexible CTE delivery system. Modifications include:***

   - ***Updating other references to vocational education in Section 258.1 of the Iowa code to reflect current CTE terminology, the Career Clusters model, and the role of Career Academy Plans of Study;***

   - ***Promoting the use of 28E agreements to allow schools to offer a full range of CTE programs to their students that meet program accreditation requirements. Create model 28E agreements that can be quickly adapted to local needs;***

   - ***Revise Code 256.7 to allow students to take core academic course via virtual learning experiences and have those courses count for the school's minimum offerings of academic courses;***

   - ***Revise Code 256.7 to allow students to take CTE courses via virtual learning if that course is not offered by the local district or community college, but has been identified as an area of interest in the student's personal plan of study;***

   - ***Create policies and guidance that allow or encourage CTE students enrolled in college credit CTE courses to take academic core classes during the summer, or via distance learning to give them a more flexible daily schedule. Clarify that high school students can participate in online learning during non-school hours at home, or during open learning labs at the school site during school hours;***

   - ***Allow core academic courses and CTE courses to be offered via ICN at "off hours" such as evenings and weekends, if that is more amendable to CTE student schedules; and***

   - ***Create model "hybrid" CTE courses that offer a portion of the content in an online format and also allow for live lab-based activities.***

5. ***Implement a Promising Practices initiative to gather information about promising strategies for better serving students from special populations groups.***

Strategic Objective 3: Connect CTE to the High School Improvement Agenda

In the 2006 report, "Redesigning the American High School for the 21st Century," the Association of Career and Technical Education noted the breadth and reach of CTE in the United States.

"CTE is a major enterprise within the United States' P-16 education system. More than 95 percent of high school students take at least one CTE course during their high school career, and about one third of high school students take a concentration of three or more related CTE courses before they graduate."[77]

Given this historical role of CTE, ACTE recognized that "it is vital that CTE educators and leaders participate in the important discussion about how to redesign American high schools for the needs of the 21st century and bring CTE's resources and areas of expertise to that discussion."

For the past three years, Iowa has been in an intensifying dialogue between state policymakers and local educators about how to best position Iowa's high schools for the future. CTE should be viewed by education leaders at the state and local levels as an integral strategy for bringing rigor, relevance, and relationships to the high school experience for Iowa's youths.

Strategy 3.1 Closely coordinate efforts at academic/CTE integration with the Iowa Model Core Curriculum.

As noted earlier, S245 requires that every district establish a core curriculum and establishes a goal of having 80 percent of graduating students meet the requirements of the core curriculum. In discussions with CTE administrators and teachers throughout the state, this requirement was seen as both an opportunity to strengthen Career and Technical Education, and conversely, a threat to its future. When the core curriculum requirement is seen as an opportunity, these CTE leaders understand the importance of connecting relevant content from CTE with the challenging academic expectations. They also realize that by linking academic requirements closely with career-related content through the Career Academy concept, they actually raise the visibility and importance of CTE coursework.

Others who see the core curriculum requirement as a threat believe that, given the tight budgets and staffing arrangements of certain schools, the CTE courses are being "squeezed out" of the curriculum. In fact, one principal who leads a very small rural high school said that his budget was so tight that adding just one mathematics course requirement would require him to hire a new math teacher and simultaneously dismiss one of the school's four CTE teachers.

Hybrid Academic/CTE Courses

The May 2006 Model Core Curriculum report indicated openness to interdisciplinary approaches to carry out the core academic curriculum. "An interdisciplinary approach is key to successfully upgrading the rigor and relevance of students' work. Coordination through the entire K-12 curriculum will be vital."

Further, at the Iowa High School Summit in December 2006, state leaders indicated that local districts would be allowed to develop integrated academic/CTE courses that could address the Model Core standards and count on a student's transcript as meeting academic graduation requirements. Of course, districts need clear guidance about how to develop such integrated courses, and state models or pilot tests could expedite the development of these courses. The Regents Higher Education institutions also need to be brought into the discussion so they can agree to the terms by which they would recognize integrated academic/CTE courses for college admissions requirements. Districts also need support for how the "highly qualified teacher" requirements of the *No Child Left Behind Act* will intersect with this flexible policy on academic/CTE integration that the Iowa Department of Education is offering.

As noted in part III of this report, Kentucky and New York have worked to create hybrid academic/CTE courses and that comply with the "Highly Qualified Teaching" parameters of the *No Child Left Behind*

Act. These are fully integrated courses that meet the requirements of CTE content standards and the state academic content standards.

Integrating Academic Standards in CTE Courses

In addition to considering hybrid Academic/CTE courses that could meet Iowa's core curriculum requirements, the Perkins Act continues to place a strong emphasis on the integration of challenging and relevant CTE content with academic content. Section 134 of the Perkins Act says that each local applicant must explain how it will:

"improve the academic and technical skills of students participating in career and technical education programs by strengthening the academic and career and technical education components of such programs through ***the integration of coherent and rigorous content aligned with challenging academic standards and relevant career and technical education programs****…"*

Until recently, the process of effectively integrating academic content into CTE courses was done largely on a case-by-case, teacher-by-teacher basis. However, since 2005, the National Center for Research on Career and Technical Education (National CTE Center) has carried out a research project called the "Math in CTE" project. The research project successfully validated the premise that, with a strong CTE curriculum and well prepared teachers, the mathematics knowledge and skills of students in CTE courses could be improved over other students who did not participate in CTE.

Now, the National CTE Center is offering technical assistance on the Math-in-CTE project to additional states on how to use and teach the lesson plans. In future years, the research center may broaden the scope of its work by helping states and districts apply the curriculum development and professional development processes it employed to other subject matter like reading, writing, and science.

Iowa should fully embrace the opportunity to develop hybrid Academic/CTE courses and to systematically integrate academic content, aligned to the Model Core Curriculum, in all its CTE courses. In this way, CTE can become a major component of Iowa's High School Project.

Strategy 3.2 Position CTE as a "stretch learning" opportunity within the Iowa High School Project's Rigor/Relevance Framework.

As noted earlier, at the third high school summit of the Iowa High School Project, held in 2006, two break-out sessions were offered to explain the interconnection between high school reform and Career and Technical Education. This was the first time at the summits that CTE had been referred to explicitly. Future activities of the Iowa High School Project and the high school summit would benefit from an ongoing strand devoted to academic/CTE integration, and including CTE more purposefully in the high school redesign agenda.

CTE also can support the Iowa High School Project's application of the Rigor and Relevance framework, and its emphasis on "stretch learning." Dr. Willard Daggett, in presenting at the 2005 summit, indicated the role of Core Academics and "stretch learning" as follows:

- *"Core Academic Learning* (Achievement in the core subjects of English language arts, math and science and others identified by the school);

- *Stretch Learning* (Demonstration of rigorous and relevant learning beyond the minimum requirements)"

CTE courses also should be recognized for their ability to strengthen "student engagement," defined by Daggett in the following way:

"*Student Engagement* (The extent to which students are motivated and committed to learning; have a sense of belonging and accomplishment; and have relationships with adults, peers, and parents that support learning)."

CTE courses, in which students apply their learning and are usually involved in a career and technical student organization, can strengthen engagement from both the content aspect and the relational aspect of the program.

CTE, rather than being ancillary or irrelevant to the core academic mission of schools, can become the testing ground for stretching learning where students can apply their knowledge, and the place where rigor, relevance and relationships can intersect.

Action Steps to Accomplish Strategic Objective 3

1. ***In coordination with state working groups addressing career academy plans of study, convene Academic Integration Working Groups (AIWG) that cover major CTE content areas. Each AIWG should include teachers from CTE and three academic disciplines (English/language arts, mathematics, and an appropriate science), and include at least one curriculum development specialist/consultant.***

2. ***The first task for each AIWG is to review CTE model curriculum standards and identify academic standards from the Model Core Curriculum that can be taught and reinforced into each CTE course, beginning with the most widely taught courses. This action step would result in a "crosswalk" of CTE content and Model Core Curriculum content.***

3. ***After the CTE/Model Core Curriculum crosswalk has been created, the AIWG should gather and validate, or create new, model lesson plans that demonstrate exactly how the Model Core content can be taught in CTE classroom context. These model lesson plans should address the criteria for the "rigor and relevance framework" that has been adopted by the Iowa High School Project.***

4. ***The AIWGs should also gather models of fully integrated academic/CTE course standards (such as the 10 courses developed by Kentucky) for review and validation. Working from existing examples, the AIWGs should develop model curriculum standards for use by Iowa districts in meeting each district's core curriculum requirements.***

5. ***The Iowa High School Project should organize professional development opportunities for teachers in the use of model lesson plans and Academic/CTE curriculum standards. The professional development should be offered during summer professional development institutes, future high school summits, and also presented by master teachers in a way that is viewable or downloadable in an online format.***

6. ***IDE should contract with the National Center for Research on CTE to provide training to Iowa's CTE and academic teachers about how to effectively integrate academic content into CTE courses, using the curriculum development and professional development model crafted for the national "Math in CTE" research project.***

7. ***The Iowa High School Project should officially adopt CTE as an ongoing emphasis, and help position CTE as a "stretch learning" strategy for student learning. Strands of future high school summits and other meetings should include workshops on how to integrate the Rigor and Relevance framework in CTE courses.***

Strategic Objective 4: Link CTE to the Competitiveness Agenda

It is clear from a variety of perspectives – the Department of Education's emphasis on high school reform and community college excellence, the governor's proposals on renewable energies, and the Iowa Works campaign – that Iowans are focused and serious about improving their education systems in a way that builds a high-quality workforce to ensure Iowa's economic future.

The new Perkins Act also puts a clear emphasis on helping individuals gain the knowledge and skills necessary for lifelong learning and career advancement, and also to help strengthen regional, state and national competitiveness. Perkins IV also puts an emphasis on preparing students for careers that are high-skill, high-wage or high-demand, and that are found in current or emerging occupational opportunities.

Iowa leaders should explicitly connect its redesign of CTE with the state's competitiveness agenda. This requires promoting and funding high quality model programs in engineering and other technical fields, and coordinating and streamlining state and local business engagement activities among state and local agencies.

Strategy 4.1 Link to the competitiveness agenda by promoting national model programs in engineering and science.

Project Lead the Way (PLTW) is a four-year pre-engineering curriculum that was developed by industry and educators to address the shortage of engineers and engineer technicians and the high rate of attrition in associate and baccalaureate engineering programs.* Through a sequence of courses offered each year of high school, students are introduced to engineering and challenged to apply their math and science skills to solve real-world engineering problems. Participants must also complete four credits each in English, mathematics, and laboratory science, and three credits in social students. All academic courses must be at the college preparatory level. Community colleges and universities play an active role in training teachers and supporting the curriculum, linking students to postsecondary opportunities. Educators at more than 500 high schools in 24 states are now implementing PLTW.

With support from the Kern Foundation and guidance from the Iowa Department of Education, by fall of 2007, 61 middle and high school *Project Lead the Way* sites will have been established in Iowa. The State Board of Education's proposed budget to the governor for FY 2008 asked for State funding to support expansion of PLTW. However, the budget item was not included in the Governor's Budget.

Project Lead the Way is about to launch a new curriculum development project to create a Bio-Sciences program, using the rigorous curriculum and intensive professional development model that has been developed with the pre-engineering program. Another coalition of agriculture educators is preparing to use the same curriculum and professional development model to create a rigorous Agri-Science curriculum. With the State's focus on renewable energy and agriculture science, both programs offer great promise for success in Iowa.

> ***"We know which industry sectors statewide – for example, health care and information technology – are faced with immediate skilled worker shortages, and which sectors will face shortages in the near future as the baby boom generation retires. But we need to identify those worker shortages and skill gaps at the level of regional labor markets, while engaging industries and the full range of public and private stakeholders in developing strategies to close them and to better link economic and workforce development efforts."***
>
> The Iowa Works Campaign

Strategy 4.2 Strengthen regional planning by establishing workforce/business and industry advisory boards that jointly advise K-12 CTE, community colleges, workforce development, and economic development.

Several sections of the Iowa Code lay out the criteria by which schools are to engage community members in planning for and advising education.

* For more information about *Project Lead the Way*, visit www.pltw.org.

Iowa Code section 258.4.9 refers to the need "to establish a regional planning process to be implemented by regional planning boards, which utilize the services of local school districts, community colleges, and other resources to assist local school districts in meeting vocational education standards while avoiding unnecessary duplication of services." Section 258.16 establishes the duties of the regional vocational education planning boards "to assist school corporations in providing an effective, efficient, and economical means of delivering sequential vocational education programs for students in grades seven through fourteen, which use both local school district services and merged area school services."[78]

Iowa Code section 258.9 lays out the membership of the Local Advisory Council for each of the vocational education programs. The local advisory councils give "advice and assistance to the board of directors in the establishment and maintenance of schools, departments, and classes that receive federal or state funds under this chapter."

This section appears to be slightly outdated and may conflict with other planning requirements carried out by Iowa Workforce Development and the Iowa Department of Economic Development.

Strategy 4.3 Require more intensive coordination of high school and community college programs around workforce needs.

Local school districts are not required to have their Career and Technical Education programs reviewed and approved by the Iowa Department of Education. However, the State does indirectly exert influence over the development of local programs, because only State-approved CTE programs are eligible for supplemental funding through the Iowa Department of Education's Iowa Vocational Reimbursement fund.

Among the program approval criteria, some have a more direct relationship to addressing the needs of the labor market. They are:

- Utilize content standards and benchmarks – competency-based (performance indicators) curriculum that reflects *current industry standards*.
- Demonstrate responsiveness to student interest and *labor market needs*.
- Utilize input from an *advisory council/committee*.
- Prepare students for *entry-level employment*, *self-employment*, and/or postsecondary education within their chosen field.
- Provide students with *employability skill*s.

In general these standards are good, but in practice, they are not always implemented with a great deal of attention to them. The challenge is how to give workable implementation guidance so these standards are more measurable, and help guide program improvement.
With relation to industry standards, strategic objective III already provides recommendations about upgrading the CTE curriculum to link to industry standards, and to create workable assessments on those CTE standards.

The program approval criterion says the program must "demonstrate responsiveness to…local labor market needs." The Department of Education has worked with Iowa Workforce Development to create the analytical tools for determined local labor market needs for programs. However, there is not a mechanism in place for program review or re-approval by which to apply this criterion.
One area of concern is the growing need for health care providers. In a 2003 survey conducted by the Iowa Center for Health Workforce Planning, long-term care employers reported vacancy rates for Registered Nurses (RN), Licensed Practical Nurse (LPN), and Certified Nursing Assistant (CNA) positions rose from 10 to 14 percent. During the same period, Iowa hospitals reported 780 RN vacant

positions, 70 LPN positions, and 250 CNA positions. In both settings employers reported it typically took 60 days or longer to fill a vacant RN position, 30-59 days for LPN positions, and less than 30 days for CNA positions. [79]

Yet, given this strong labor market demand, there is a serious mismatch between high school and postsecondary offerings in the health sciences area. At the high school level, CTE enrollment data indicates there are 3,972 participants, just 2.35 percent of all high school CTE participants. At the postsecondary level, there are 18,941 participants, or 37.56 percent of all postsecondary CTE programs. One major challenge facing health sciences education is the availability of qualified instructors, who can earn a much higher salary in the health care field than in education. This is an issue where allowing market factor funds for hiring CTE health sciences instructors would be particularly helpful.

Table 4 indicates how many individuals are enrolled in community college CTE programs, and how those enrollments compare with high school CTE enrollments, using the career cluster model. Data on community college enrollments by Career Cluster is not yet available, but some of the program areas compare directly against the Career Clusters.

Table 4
Comparison of College CTE Enrollment with High School CTE Enrollment

College CTE Enrollment by Program Area			High School CTE Enrollment by Career Cluster		
Program Area	**Fiscal Year 2005**		**Career Cluster**	**Fiscal Year 2005**	
	N	**%**		**N**	**%**
Agriculture	2043	4.05%	Agriculture, Food, Natural Resources	14,836	8.76%
Business	12,015	23.82%	Business management and administration	43,100	25.46%
			Finance	0	0.0%
Marketing	1259	2.50%	Marketing Sales and Service	13,054	7.71%
Family and Consumer Sciences	2294	4.55%	Education and Training	333	0.20%
			Government and public administration	0	0.00%
			Hospitality and Tourism	4922	2.91%
			Human Services	41,461	24.49%
Health	18,941	37.56%	Health Science	3972	2.35%
Industrial Technology	13,266	26.30%	Architecture and construction	21,931	12.96%
			Information Technology	6042	3.57%
			Manufacturing	1073	0.63%
			Science Technology Engineering and Mathematics	9652	5.70%
			Transportation, distribution And Logistics	7524	4.44%
			Arts, AV tech, and communications	1380	0.82%
Multi-Occupation	614	1.22%			

Source: Condition of Iowa Community Colleges, 2005, page 9, and Career and Technical Participant Enrollment, table 1, the Annual Career and Technical Education High School Report 2007, page 10

The Renewable Energy Sector

Another key economic opportunity for Iowa lies in its leadership in renewable energy. In 2007, the Iowa legislature acted on Governor Culver's proposal to create a $100 million Iowa Power Fund by enacting the Iowa Power Fund (HF 918) and the Power Fund Appropriations bill (HF 927). As part of the Iowa Power Fund, a new Office of Energy Independence will be created, led by an appointee of the governor.

In signing the new bills, Governor Culver said, "The Power Fund is an exciting, forward-thinking plan that will coordinate our efforts as we explore our new energy frontier. By signing the Power Fund into law, we can create the jobs of the future in Iowa that will keep our kids at home where they belong."[80]

As mentioned earlier, Project Lead the Way is developing a new curriculum in the Biomedical-Science area, and another curriculum in Agri-Science is under development. These programs could form the basis for a Career Academy emphasizing preparation for the renewal energy sector.

Action steps to accomplish Strategic Objective 4

1. ***Designate State funding to support expansion of the Project Lead the Way pre-engineering program to reach every high school student in Iowa over the next three years.***

2. ***Designate funds from the Iowa Power Fund to support development of Career Academy programs that are related to the state's "energy independence" plan and employment in the renewable energy workforce.***

3. ***Require every PLTW site (and eventually Biomedical-Science and Agri-Science) to offer a Career Academy in partnership with a community college program or a college/university. Allow statewide agreements for students that wish to pursue postsecondary education in another part of the state from where they attended high school.***

4. ***Establish Business and Industry/Employer Cluster Advisory Groups for each of the Career Clusters, with a priority on the Clusters for which there are already active programs of study. The Clusters Advisory Groups should be established and jointly-funded with Iowa Workforce Development and Iowa Department of Economic Development.***

5. ***Work to establish one state-level business engagement strategy that coordinates activities among the Iowa Department of Education, Iowa Workforce Development, and the Iowa Department of Economic Development.***

6. ***Convene a state-level working group among the Iowa Department of Education, Iowa Workforce Development and the Iowa Department of Economic Development to identify all regulations and policies relating to local business and industry engagement and advisory functions. Create joint guidance from the three state agencies on how***

local education, workforce and economic development authorities can coordinate activities and reduce duplication of efforts.

Strategic Objective 5: Build the Quality and Supply of CTE Teachers

For current CTE teachers, there is the ongoing challenge of reaching and maintaining high levels of teaching – by staying fresh in their knowledge about the field in which they teach, and applying research-based instructional practices that help the maximum number of students find success.

Current CTE high school teachers and college faculty also express deep concern about the supply of CTE teachers. There is clearly a need to find new ways of attracting more youths and adult professionals into CTE teaching, and also create strategies to help current teachers make a transition into CTE instruction with as few barriers as possible.

Iowa's education and policy leaders should take quick action to address these priorities.

Strategy 5.1 Increase collaboration for professional development among CTE teacher groups.

High-quality teaching is based on two essential conditions – that the teacher has a deep knowledge of content and the skills in effective teaching methods. The new Perkins Act emphasizes these attributes and supports ongoing, intensive professional development opportunities.

Currently, individual consultants assigned to work with teacher groups each provide advice and assistance to each teacher organization. However, the Iowa Department of Education needs to do more to provide consistent professional development opportunities across CTE disciplines.

The Iowa professional development plan should emphasize a positive balance of strengthening industry and content knowledge, and improving instructional strategies and the application of learning theory.

Some of this professional development needs to happen among teachers within a certain discipline, while other professional development can be more general in nature.

Another component of excellent professional development is collaboration among teachers to improve instructional practice. According to CTE teachers interviewed during the Information-gathering Sessions, collaboration is more of a challenge for CTE instructors than for some other teachers. Often in a small school, the business or industrial-arts CTE teacher is the only instructor covering that discipline in the school. Collaboration to improve instruction in that discipline is simply not going to happen within the confines of school walls. That is why opportunities for professional development and connection with other teachers in that field are so welcome. The benefits of meetings and conferences with other teachers in the discipline should not be discounted.

On the other hand, CTE instructors have often identified more with their particular discipline (business, family and consumer science, agriculture, etc…) than with the larger endeavor of Career and Technical Education. This sense of discipline-specific isolation can work against the goal of connecting CTE teachers to broader school reforms and collaboration with other CTE and academic teachers.

Currently, the state provides "summer updates" for each of the teacher associations in Iowa. Based on the unique identity of the groups and their various traditions, multiple professional development conferences are held at various times and locales.

The Iowa Department of Education and the CTE teacher associations should strongly consider holding a hybrid professional development conference – allowing for some discipline-specific work and meetings, but also bringing all CTE instructors together. By eliminating duplication of logistics and organizational planning time, financial resources will be used more efficiently. Just as importantly, the field of CTE can develop as a whole with more shared experience, knowledge and expertise developed through joint conference sessions.

Another issue that came up consistently was the role, or lack thereof, of the Area Education Agencies in providing guidance and professional development related to CTE. It would be useful to create an explicit role and funding for AEA's to provide professional development support for CTE teachers.

Strategy 5.2 Examine professional development policies and funding for postsecondary faculty.

During the regional information-gathering sessions, it became clear that postsecondary faculty were looked to provide input and guidance for their CTE secondary counterparts. But in some colleges, there was very little, if any, structured and funded professional development for college faculty. In the same way that secondary teachers need regular strengthening of technical skills and teaching methodology, postsecondary faculty also need the same opportunities.

Strategy 5.3 Provide creative approaches to strengthen CTE teacher recruitment and retention.

During the information-gathering sessions, school leaders discussed ways of recruiting hard-to-find CTE teachers, particularly in rural settings.

Use of "Market factor" Funds

House File 2792, the student achievement and teacher quality program, provided $3,390,000 for state assistance to allow school districts to add a "market factor" to teacher salaries paid by the school district. The market factor salary incentives may include improving salaries for factors due to geographic differences and subject area shortages. The amount to be awarded to a school district is made by a statewide formula, and the use of the funds within the district is determined by the local school board. The funds are meant to supplement, but not supplant, wages and salaries paid as a result of a collective bargaining agreement. [81]

State Job Listing Services for Recruiting

During the regional discussions, small and rurally-isolated school districts described the extreme challenge in recruiting new teachers. The resources of the small districts are too small to carry out statewide recruiting. The Iowa Department of Education sponsors the "Teach Iowa" services, which is a statewide listing of job openings in teaching but participants from small districts that participated in the information-gathering groups did know about this resource. [82] The IDE Division of Community Colleges and Workforce Preparation may need to provide more training and raise awareness of this site so that rural districts use it in their recruiting strategies.

Action steps to accomplish Strategic Objective 5

1. ***Create a master plan for professional development among all the CTE teacher organizations, including a joint summertime professional development conference that allows for a mix of discipline specific activities and joint activities among all the teaching groups.***

2. ***Conduct a comprehensive review of teacher licensure requirements, and realignment licensing requirements to match the new career clusters model.***

3. ***Organize joint summer institutes among the CTE teacher groups, allowing discipline-specific work and joint CTE-wide activities. Require every CTE teacher to attend a summer update on a rotation basis, such as every 3 years, as part of the teacher's licensure renewal.***

4. ***Engage the Area Education Agencies to begin providing targeted technical assistance, with an emphasis on bringing academic/CTE integration and sharing knowledge about promising practices for students from special populations' groups.***

5. ***Create an explicit role and responsibility for community colleges to provide professional development for high school CTE teachers.***

6. ***Review the formal professional development opportunities for postsecondary teachers, and determine exactly how accreditation affects teacher development. Convene a statewide working group on this issue and propose common statewide guidance or requirements on community college professional development.***

7. ***Encourage school systems that are creating career academies to receive an additional allocation for "Market Factor" funds toward hiring teachers in the CTE area covered by the Career Academy.***

8. ***Provide additional market dollars to hire teachers to be shared between the high schools and the community colleges.***

9. ***Continue to support and raise visibility of the statewide CTE teacher vacancy posting resource to help attract students into CTE teaching.***

Conclusion: The Opportunity for Reflection – And Action

To fulfill its potential in support high school redesign, workforce quality and economic development, CTE in Iowa needs thoughtful redesign and targeted financial resources to allow it to emerge as a strategy ready to address the complex learning needs of students and workers in the 21st Century U.S. economy.

Iowa's elected officials and education leaders at both the state and local levels are urged to reflect upon all the interrelated recommendations of this report, engage all the relevant stakeholders in discussion and planning, and create a clearly articulated CTE redesign strategy that extends over the six-year period covered by the Perkins Act reauthorization.

Through strong state leadership and consistent local program improvement, Career and Technical Education in Iowa will be recognized as an integral part of the state's education, workforce and economic development strategies. CTE in Iowa will help prepare Iowa's high quality workforce and sustain its U.S. and global competitiveness for decades to come.

# # #

Appendix 1. Career Clusters

Career Clusters provide a way for schools to organize instruction and student experiences around sixteen broad categories that encompass virtually all occupations from entry through professional levels. Resources are available for each of the sixteen clusters. For additional information, visit the States' Career Clusters website: www.careerclusters.org.

The sixteen clusters and their descriptions are listed below.

Agriculture, Food, and Natural Resources. The production, processing, marketing, distribution, financing, and development of agricultural commodities and resources including food, fiber, wood products, natural resources, horticulture, and other plant and animal products/resources.

Architecture and Construction. Careers in designing, planning, managing, building and maintaining the built environment.

Arts, Audio and Visual Technology, and Communications. Designing, producing, exhibiting, performing, writing, and publishing multimedia content including visual and performing arts and design, journalism, and entertainment services.

Business, Management, and Administration. Business Management and Administration careers encompass planning, organizing, directing and evaluating business functions essential to efficient and productive business operations. Business Management and Administration career opportunities are available in every sector of the economy.

Education and Training. Planning, managing and providing education and training services, and related learning support services.

Finance. Planning, services for financial and investment planning, banking, insurance, and business financial management.

Government and Public Administration. Executing governmental functions to include Governance; National Security; Foreign Service; Planning; Revenue and Taxation; Regulation; and Management and Administration at the local, state, and federal levels.

Health Sciences. Planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.

Hospitality and Tourism. Hospitality & Tourism encompasses the management, marketing and operations of restaurants and other foodservices, lodging, attractions, recreation events and travel related services.

Human Services. Preparing individuals for employment in career pathways that relate to families and human needs.

Information Technology. Building Linkages in IT Occupations Framework: For Entry Level, Technical, and Professional Careers Related to the Design, Development, Support and Management of Hardware, Software, Multimedia, and Systems Integration Services.

Law, Public Safety, Corrections and Security. Planning, managing, and providing legal, public safety, protective services and homeland security, including professional and technical support services.

Manufacturing. Planning, managing and performing the processing of materials into intermediate or final products and related professional and technical support activities such as production planning and control, maintenance and manufacturing/process engineering.

Marketing, Sales, and Service. Planning, managing, and performing marketing activities to reach organizational objectives.

Science, Technology, Engineering, and Mathematics. Planning, managing, and providing scientific research and professional and technical services (e.g., physical science, social science, engineering) including laboratory and testing services, and research and development services.

Transportation, Distribution, and Logistics. Planning, management, and movement of people, materials, and goods by road, pipeline, air, rail and water and related professional and technical support services such as transportation infrastructure planning and management, logistics services, mobile equipment and facility maintenance.

# # #

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Site coordinators (listed in order of the meetings) were: **Dave Bunting, Mary Lou Erlacher**, and **Mindy Thornton** of Kirkwood Community College; **Marlene McComas** and **Jan McNeil** of Iowa Central Community College; **Mindy Dresback** of Southwestern Community College; **Vicki Petsche** and **Jamie Donahue** of Iowa Western Community College; **Randy Gabriel** and **Randy Mead** of Des Moines Area Community College; and, **Robin Blount** of Eastern Iowa Community College.

Alisha Hyslop assisted in gathering information about state CTE practices. Ms. Hyslop and **Joy Meeder** provided editorial services.

About the Meeder Consulting Group

The Meeder Consulting Group, LLC, led by Hans Meeder, helps empower education leaders with creative and research-based solutions, aligning policy and practice with high expectations. Mr. Meeder has 20 years of experience working in state and federal education policy, and prior to founding the consulting practice, was Deputy Assistant Secretary for Vocational and Technical Education in the U.S. Department of Education, responsible for establishing policy, regulation and guidance relating to the Perkins Vocational and Technical Education Act. He possesses extensive legislative drafting training and experience from three years as policy and outreach director of the U.S. House of Representatives Committee on Education and Labor. Mr. Meeder also has a Masters in Business Administration, with an emphasis on organizational development and the use of technology in business.
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Hans K. Meeder is President of the Meeder Consulting Group, LLC, a firm providing consulting services in school improvement related to high school redesign, career and technical education, and adolescent literacy. Mr. Meeder has an extensive and varied career in education and workforce policy, with an emphasis on high school redesign, career and technical education, and workforce quality. Immediately prior to forming the Meeder Consulting Group, Meeder served as Deputy Assistant Secretary for Education in the U.S. Department of Education Office of Vocational and Adult Education.

In this context, Meeder led the Department of Education's High School Initiative, in which he guided development of highly regarded policy papers, and convened working high school summits that engaged teams from all 50 states and dozens of school districts. Mr. Meeder also directed the development of critical research on adolescent literacy and the *Smaller Learning Communities program* to help large high schools restructure to offer students more personalized and rigorous educational opportunities.

Meeder also oversaw implementation of the Carl Perkins Vocational and Technical Education Act and was a leading voice in helping articulate how modern career technical education efforts can play a pivotal role in transforming high schools and raising student achievement

In addition to high school and CTE issues, Meeder oversaw implementation of the Adult Education and Family Literacy Act and its interaction with the public workforce investment system.

Prior to joining the Department of Education, Mr. Meeder served as Senior Vice President for Workforce Development and Postsecondary Learning at the National Alliance of Business. He also was Executive Director of the 21st Century Workforce Commission, a Presidential Commission that made policy recommendations relating to the Information Technology workforce.

Mr. Meeder served as Education Policy and Outreach Director for the House of Representatives Committee on Education and the Workforce. Prior service also included work in the Congressional relations office of the Department of Education and work for several members of the House of Representatives.

Mr. Meeder lives in Columbia, Maryland with his wife and children. He is a graduate of the University of Maryland College Park and also holds a Masters in Business Administration from the University of Maryland's University College.

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