

Health Science and Technology State of the Art

*Provided through the CTE Curriculum
Revitalization Initiative*

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Introduction

Purpose of Paper

The purpose of this State of the Art paper pertaining to secondary Health Science and Technology (HST) Education is to provide information that the Illinois State Board of Education can utilize to guide the HST Curriculum Revitalization Initiative (CRI) and related program approval and certification decisions. To address this purpose, the paper provides an overview of the background leading to the current status of HST education within the state of Illinois, pertinent data supporting the need for the CRI, and analyses in the form of a summary and conclusions.

Goal of the Curriculum Revitalization Initiative (CRI) for Health Science & Technology (HST) Education

Revitalization of Career and Technical Education (CTE) in Illinois will require the application of rigor, relevance, and accountability in relation to all curricula. An important step in achieving this application will be the development of model curriculum as part of the Curriculum Revitalization Initiative (CRI). This initiative is funded by the Illinois State Board of Education (ISBE) through a grant supported by monies from the Carl D. Perkins Vocational and Technical Education Act of 1998, Public Law 105-332 to the Illinois Office of Educational Services, Southern Illinois University, Carbondale.

The primary goal of the CRI is to contribute to meeting (1) the No Child Left Behind (NCLB) legislation, (2) the Illinois Goals and Learning Standards, (3) the Illinois Higher Standards requirements for graduation, and (4) the task and skill standards (Workplace Skills and Occupational Skill Standards) of business, industry, and labor through the development, diffusion, and dissemination of model CTE secondary curricula (i.e., 9th through 12th grades). With the cooperation of a statewide advisory group, ISBE, local administrators, teachers, and teacher educators, the HST content area has worked towards completing the following objectives:

- Investigate out-of-state (see Appendix A) and in-state curriculum in order to determine if existing curricula can be adopted or adapted in order to meet the goal of the CRI.

- Develop a teacher advisory committee/work group to actively participate in determining a curriculum which meets the needs of students, schools, and business/industry (see Appendix B).
- Identify an exemplary curriculum model format for developing lesson plans (see Appendix C), PowerPoints, assessments, a website, and a marketing/dissemination plan.
- Develop a business, industry, and labor (BIL) advisory committee to provide guidance and feedback concerning the occupational needs within the health care industry and to assist in the dissemination and publication of the final curriculum model (see Appendix D).

Background

Historical Perspective of CTE

When discussing career and technical education, most mark the beginning of vocational education in secondary schools with the passage of The National Vocational Act of 1917 (i.e., J. Smith-Hughes Act). In reality, federal acts and events supporting and/or funding vocational education date back as far as 1862. (See Appendix E, “Legislation and Other Government Actions that have Impacted Support of Career and Technical Education,” for information about key legislation supporting CTE from 1862 through 1998). From then through now, legislation intended to develop and fund career and technical education has included emphases on assessment and accountability, which have been defined in various degrees and ways across time. For example, in the National Vocational Education Act of 1917, assessment and accountability were defined by home visits and individual projects negotiated with the teacher. In the Vocational Act of 1963, the focus of assessment and accountability broadened to include research, curriculum development, personnel and leadership development, cooperative education, and work-study. With the 1968 Amendments to the vocational legislation, competency-based education was highlighted, and legislation throughout the 1970’s further defined competency-based education by stressing the need to infuse/integrate academics into such models.

Infusion/integration of secondary education with post-secondary education and/or training was addressed in the 1984 Carl D. Perkins Vocational Education Act. This act underscored the need for vocational articulation, and it provided Tech Prep, a program to

strengthen academic content at the high school level in order to allow students to take higher level technical courses in post-secondary education. Although this Act was impressive for what it purported to provide to students, it provided fewer dollars for state activities and administration, while increasing the number of students to be served and the amount of data to be reported.

In the decade of the 1990s, vocational education legislation further emphasized the importance of the secondary-to-postsecondary transition, academic integration, and competency-based education. More specifically, in the 1990 reauthorization of the Carl D. Perkins Vocational Education Act, combined secondary and postsecondary programs designed to lead to two-year associate degrees, certificates, or adult apprenticeships were included to strengthen the primary goal of Tech Prep implementation. In addition, the 1998 reauthorization of the Act sought to integrate activities defined in the School-To-Work (STWOA) and Workforce Investment Act (WIA), while maintaining a unique identity for career and technical education in secondary schools.

State and National Trends Impacting CTE Curriculum Development

From a state-wide perspective, delivery of Career and Technical Education in Illinois has been somewhat ‘uneventful’ since the last major initiative for curriculum revitalization occurred in 1985 through 1989. During this time, funds were allocated for curriculum development and implementation to all five CTE program areas: Agricultural Education, Business Education, Health Science and Technology Education, Consumer and Family Sciences Education, and Industrial Technology Education. Impetus for this movement came from the passage of the Carl D. Perkins Vocational Education Act of 1984, which provided curriculum funding, and from the release of *A Nation at Risk: The Imperative for Educational Reform*, which was published in April 1983 by the National Commission on Excellence in Education.

Throughout the *A Nation at Risk* report, weaknesses related to the academic content areas of study were sighted, but vocational education was not included in the report. At the conclusion of the report, the Commission advanced the following recommendations:

- Graduation requirements should be strengthened so that all students establish a foundation in five *new* basics: English, mathematics, science, social studies, and computer science.

- Schools and colleges should adopt higher and measurable standards for academic performance.
- The amount of time students spend engaged in learning should be significantly increased.
- The teaching profession should be strengthened through higher standards for preparation and professional growth.

During the spring and fall of 1983, Commission members made several presentations about their work and the final report. At a meeting held in Chicago at the Museum of Science and Industry, Commission members were asked why vocational education (i.e., career and technical education [CTE]) was not included in the report. Members present said they had run out of both time and money, but they believed vocational education should have been studied and that it should be a required part of a comprehensive education (Potts, 2005). Immediate impacts of this report included an increase in the academic requirements for high school graduation, which subsequently equated to an immediate decline in vocational education enrollments, and an emphasis on teacher training in math and science.

Although this report did not directly pertain to CTE, the validity of what the report conveyed was used to incite changes in CTE curricula and accountability. Consequently, each of the five career cluster areas recognized within the State of Illinois and listed above undertook state-wide efforts to revitalize curriculum and to ensure that the systems and tools supporting the existence of CTE, such as work-based learning, business/industry involvement, and career clusters, were included and appropriately addressed within these efforts. Work-based learning was first introduced in the Vocational Education Act of 1963 through cooperative education, where the primary goal was to prepare students for work using authentic learning and assessment models. Accurately defining “authentic” necessitated the involvement of business/industry, and such partnerships have been a part of vocational education legislation since the Vocational Act of 1963 when business/industry advisory committees were made a requirement. To further define who the constituents of business/industry advisory committees should be, what skills and knowledge are needed in relation specific work-based learning programs, and the provision of CTE overall, the essence of career clusters have been used and refined throughout the history of CTE (NOTE: Appendix F discusses additional state and national trends impacting curriculum development).

Currently, career clusters identify pathways from secondary school to two- and four-year colleges, graduate schools, and the workplace so students can learn in school what they can/will do in the future. This connection between learning and future goals purportedly motivates students to work harder and to enroll in more rigorous, relevant courses. Use of career clusters in secondary schools typically places the emphasis on generalizable skills and preparedness for post-secondary education, rather than on specific job skills, and each state has “individualized” the use of career clusters to fit its’ local needs. For example, Maryland has adopted nine clusters, Utah and North Dakota have adopted five clusters, and other states have adopted the sixteen clusters identified by the National Association of State Directors of Career and Technical Education Consortium. Benefits of organizing CTE by clusters include the following:

- *Providing a broad, long-term conception of work.* Occupationally-specific CTE should not be abandoned, but it should be provided in a larger context so that students can generalize learning, make connections between education and work, and potentially adapt to changes in their jobs or careers.
- *Strengthening academic foundations.* Many students need and thrive on the opportunity to apply essential academic skills within a work-related context. In general, academic application is more readily achieved and most beneficial when it occurs in relation to a broadly defined field, such as science applied to the entire health care industry, rather than to only a specific occupation, such as dental assistant.
- *Promoting strong secondary-postsecondary connections.* A lifetime of change will mean a lifetime of learning, often including formal post-secondary education. Broader CTE programs (i.e., health science and technology, rather than nursing assistant) lend themselves better to a range of postsecondary options, including 4-year options.
- *Emphasizing long-term careers, rather than entry-level jobs.* For viable long-term careers, students will need academic knowledge, information literacy, and the ability to learn how to learn in order to keep pace with changes in and across careers.

Education for Employment in Illinois

In an effort to keep pace with changes in vocational education explicated in the Carl D. Perkins Vocational Education Act of 1984, the Illinois State Board of Education approved a new policy statement and administrative plan for education for employment on December 13, 1984.

This policy statement emphasized the need to provide high-quality education for employment options to students, and recommendations put forth on how to accomplish this were based on a study completed by the State Superintendent of Education in 1982. Specifically, it was recommended that a regional delivery system, entitled Education for Employment (EFE), be developed to incorporate vocational education, employment and training, career education, and adult education. This regional delivery system could ideally enable CTE programs throughout the state to become more productive and more effective in educating students. More specifically, productivity of local CTE programs should increase since state and federal CTE program compliance issues would be handled at a regional level, as opposed to a local school level, and effectiveness of local CTE programs should increase since CTE teachers would have an expanded, from a local to a regional and state, network of teachers from whom to draw “best practices.”

In light of the potential benefits to CTE and other education to employment issues, sixty-one regional delivery systems were formed across the state in 1986. Joint agreements stating schools would share instructors and facilities, eliminate outdated programs, conduct joint in-service training sessions, and jointly purchase state-of-the-art equipment were initiated. Upon adoption of these joint agreements among secondary schools within the same region, regional delivery system directors then negotiated articulation agreements with community colleges in their regions to provide for additional joint use of staff and facilities where feasible and economical. Over the years there have been changes in the number and make-up of the delivery systems, but the underlying mission and work of the education for employment system have remained intact.

CRI Efforts and Previous State Curriculum Models

Career and Technical Education, and the systems that support its existence, is necessary and essential in preparing students for work and/or further education. Curriculum revitalization is vital to ensuring that the quality and content of instruction keeps pace with technology and industry needs. In Illinois, no major statewide CTE curriculum development or revitalization initiative, except in Agricultural Education, has occurred since the mid- to late 1980s. Because of this, in 2001 a CTE Challenge Task Force recommended, as part of its report to the ISBE, the development of career-specific K-12 curricular models that are aligned to the Illinois Learning

Standards and designed to help prepare students for post-secondary education and employment. In 2003, the Illinois Office of Educational Services (IOES) formed a Planning Committee to develop operational guidelines and parameters for a CTE Curriculum Revitalization Initiative (CRI), and in 2004 specific objectives were outlined by the CTE CRI Advisory Committee. These objectives included the following:

Each curriculum model will:

1. Align with state learning standards
2. Involve the occupational professional organizations
3. Be teacher developed
4. Be developed in partnership with business, industry, and labor
5. Articulate with post-secondary programs
6. Reflect current technology
7. Contain the following products
 - a. units of instruction
 - b. lesson plans
 - c. student evaluation tools
 - d. visual aids
 - e. recommended resources
 - f. professional development for teachers and administrators
 - g. technical assistance

Specific outcomes projected to occur with fulfillment of these objectives included the following:

Increase the number of:

1. Students enrolling in post-secondary education
2. Students enrolling in post-secondary education without the need for remediation
3. Students meeting and exceeding state standards
4. Students graduating from high school
5. Students prepared for the highly technical workforce
6. Career and Technical Education programs that will better meet the needs of labor market demands.

In this same year, the project selected Health Science and Technology (i.e., Health Occupations) as the first career cluster area to address since health care represented the highest priority in the critical shortage of workers at the local, state, and national levels and because health science and technology (HST) was the smallest secondary CTE program in Illinois.

Related DCEO-Funded Curriculum Support

Due to this shortage of both programs and workers, the Illinois Department of Commerce and Economic Opportunity (DCEO) partnered with the Illinois Community College Board and the Illinois State Board of Education to promote a state-wide effort to increase health occupations career awareness and selection. Under a contract with Southern Illinois University and in cooperation with the Curriculum Revitalization Initiative (CRI), a project to pilot test national HST cluster curriculum that adhered to the National Knowledge and Skill Standards (2002) was launched in 2004.

After a thorough review of the literature and of local, state, national, and commercial materials, the *National Health Science Integrated Activities* (2003) and the *American Careers Health Careers Planner* (2004) were selected to be used at the elementary (i.e., Kindergarten through 5th grade) and middle school (i.e., 6th through 8th grade) levels, respectively. During the 2004-2005 school year, schools within three education for employment (EFE) regions began using the “Illinois Health Science Career Cluster” (IHSCC) materials that included these two curricula.

At the high school level (i.e., 9th through 12th grades), health occupations teachers were asked to conduct a “gap analysis” using the National Health Science Career Cluster Foundation Knowledge and Skill Standards (i.e., National Knowledge and Skill Standards) in order to identify specific areas that may not be adequately addressed by their current curriculum. These National Knowledge and Skill Standards are the outcome of the States’ Career Cluster Initiative that was launched in the early 2000s by the National Association of State Directors of Career and Technical Education Consortium for the purpose of providing “a way for schools to organize instruction and student experiences around 16 broad categories that encompass virtually all occupations from entry through professional levels” (Career Clusters, 2002). Included within the National Knowledge and Skill Standards are foundation knowledge and skills statements, performance elements, and measurement criteria for each of the 16 clusters and for each pathway

within each of the 16 clusters. This information has been specifically identified and explicated as a means to reflect the most comprehensive and up-to-date information related to industry standards and “best practices.” In light of the quality of the initiative and the national endorsement it has received, many States are currently undertaking efforts to revise CTE curriculum to specifically incorporate the tenets of the National Knowledge and Skill Standards. Specifics beyond the gap analysis have not yet been implemented at the secondary level in the DCEO project since curriculum development and/or selection is ongoing and occurring in collaboration with the Health Science and Technology Curriculum Revitalization Initiative (HST CRI).

Agricultural Education Model

Achieving the goals of the DCEO project and the CRI will undoubtedly require a “cost” in relation to both time and money, but the “benefits” of accomplishing these goals appear innumerable when looking at the long-term and continuing successes of the Agricultural Core Curriculum model. This model was conceived in the mid-1990s when those affiliated with agricultural education began an effort to create an educational system that would expose students from grades K-12 to agricultural education. This effort was spawned by educators who had deemed the agriculture curriculum product that they had received as the outcome of the state-wide curriculum development initiative of the mid- to late-1980s as ‘unusable’. At present, the Agricultural Education Curriculum Model spans grades K-12 and consists of 6 AgriLearning Kits , 10 AgriScience Kits, and over 600 secondary lessons.

The Agricultural Education curriculum model has a 17 year history of proven success at the local and national levels. Each course within this model curriculum contains Units, Lesson Plans, PowerPoint Presentations, and Assessments, and these are designed to comprehensively address the Illinois State Goals, Learning Standards, Performance Criteria, Occupational Skills Standards, and Workplace Skills Standards. Teachers are expected to teach 70% of each course outline according to how it is written, but they have the option of “customizing” the remaining 30% however they see fit since the lessons and PowerPoints are provided to teachers via CD and can be edited whenever necessary. The Agricultural Education program operates as “a never-ending initiative” since it must continue to evolve with changes in education, agriculture, policy,

personnel, etc., and since it must continue to engage in efforts that enable students to receive academic science, math, social studies, and language arts credit for participating in its classes.

Comparison of Selected State's CTE Programs with the Goals of the CRI

After reviewing every State's web-based secondary HST materials, obtaining hard copies via mail when necessary, and/or communicating with state HST consultants or contact persons, South Carolina, Texas, Utah, and Virginia were identified as relatively farther along in the process of developing and disseminating quality secondary HST curriculum materials. Each State's curriculum materials were judged according to whether they contained lesson plans, PowerPoints, and/or assessments, the quality of these products, and how readily accessible these were for teachers to obtain.

South Carolina

South Carolina has lesson plans and PowerPoints available on-line and organized according to the 11 HST National Knowledge and Skills Standards, but 95% of the lesson plans apply only to the Academic Foundation Standard. In addition, these lesson plans are predicated on the use of specific textbooks, as opposed to being able to be used as "stand-alone" curricula, and include no means of assessment.

Texas

Texas has on-line lesson plans, PowerPoints, and assessments in relation to 14 different courses. For 2 of these courses, students can earn one science credit, and for 2 other courses, students can earn a ½ science credit. The remaining ½ to 2 credits awarded for completion of each of the remaining 10 courses are elective credits. Although some of Texas' HST courses have been approved for academic credit and the on-line curriculum contains the 3 desired/ "required" elements of lesson plans, PowerPoints, and assessments, the structure of the Texas HSTE site is not very "user friendly." More specifically, acquiring the PowerPoint presentation and assessment that corresponds to a particular lesson requires navigation through numerous links, as opposed to the three elements being more linearly connected and readily accessible.

Utah

Utah has information about their HST program available on-line, but content beyond course descriptions are only provided via CD. Although Utah has 20 approved course offerings, CDs are only available for 5 of these. Utility of these CDs vary from providing only resources to providing the extent of information needed to teach a semester course. For example, the Forensic Science CD contains only four articles; whereas, the CD for the Health Occupations Professional Essentials (HOPE) capstone course, which was specifically designed to address the National Knowledge and Skill Standards, contains lesson plans, PowerPoints, and assessments.

Virginia

Virginia has a high-tech website called VERSO, or Virginia's Educational Resource System Online, that houses frameworks and task lists written in a common format across all CTE clusters and pathways. Although these frameworks and task lists illustrate what teachers must and can teach, since bullet points next to a task identifies it as mandatory as opposed to optional, few lesson plans have been created to support the frameworks; therefore, the "meat" illustrating how to teach the depth and breadth of the content is virtually absent at this point. Virginia is scheduled to implement VERSO II towards the latter part of FY06, and this system is designed to more readily accommodate lesson plan development. In the area of HST, comprehensive frameworks have been developed for the Pharmacy Technician program, but other health occupations have not yet been addressed to a comparable degree. But, since the health care worker shortage is evident in virtually every state, Virginia has slated additional HST occupations to be addressed using the VERSO II technology once it becomes available.

Benefits of the Review

Reviewing other states' secondary CTE HST curriculum was beneficial, despite the fact a curriculum model that Illinois could simply adopt was not found, since it provided some quality resources to be used or adapted in accomplishing the HST CRI in Illinois. In addition, the need for Illinois to support an initiative designed to create and implement quality secondary CTE HST curriculum has been validated by the absence of such a curriculum in existence thus far. No state has taken the lead in designing a curriculum for Health Science and Technology that is similar to the Illinois Agricultural Education curriculum, which numerous states across the nation have

used for more than 15 years; therefore, Illinois has the opportunity to be a forerunner in accomplishing this.

Employment Data: Areas of Future and Current Need

As stated above, health care represents the highest priority in the critical shortage of workers at the local, State, and national levels. Health care is one of the largest industries in the country with over 12.9 million jobs. Health care is also one of the fastest growing industries in the country since projections through 2012 estimate that an additional 2.5 million new jobs will be created (Payne, 2005). National projections across all industries through 2010 illustrate that the fastest growing occupations are within the computer and health care fields, with 11 of the top 20 fastest growing occupations falling within the area of health care and the remaining 9 falling within the computer field (Hecker, 2001). The table below illustrates the occupations within the health care field nationally that are among the fastest growing, along with the average salary range and level of education and/or training required.

TABLE 1

Fastest Growing Occupations Nationally, 2000-2010						
[Numbers in thousands of jobs]						
Occupation	Employment		Change		Quartile Rank by 2000 median annual earnings *	Most significant source of education or training
	2000	2010	2000	2010		
Computer software engineers, applications	380	760	380	100	1	Bachelor's
Computer support specialists	506	996	490	97	2	Associate
Computer software engineers, systems software	317	601	284	90	1	Bachelor's
Network and computer systems administrators	229	416	187	82	1	Bachelor's
Network systems and data communications analysts	119	211	92	77	1	Bachelors
Desktop publishers	38	63	25	67	2	Voc. Award
Database administrators	106	176	70	66	1	Bachelor's
Personal and home care aides	414	672	258	62	4	OJT
Computer systems analysts	431	689	258	60	1	Bachelor's
Medical assistants	329	516	187	57	3	OJT
Social and human service assistants	271	418	147	54	3	OJT
Physician assistants	58	89	31	53	1	Bachelor's
Medical records and health information technicians	136	202	66	49	3	Associate
Computer and information systems managers	313	463	150	48	1	Bachelor's + Work Exp.
Home health aides	615	907	291	47	4	OJT
Physical therapist aides	36	53	17	46	3	OJT
Occupational therapist aides	9	12	4	45	3	OJT
Physical therapist assistants	44	64	20	45	2	Associate
Audiologists	13	19	6	45	1	Master's
Fitness trainers and aerobics instructors	158	222	64	40	3	Voc. Award

* The quartile rankings of Occupation Employment Statistics annual earnings data are presented in the following categories: 1=very high (\$39,700 & over); 2=high (\$25,760 to \$39, 660); 3=low (\$18,500 to \$25,760); and 4=very low (up to \$18,490). The rankings were based on quartiles using one-fourth of total employment to define each quartile. Earnings are for wage and salary workers (Hecker, 2001).

Health care is one of the largest industries in the state of Illinois, with currently more than 540,000 jobs and with over 100,000 new jobs projected to be created by the year 2012 (Payne, 2005). The table below illustrates the top 10 health occupations in Illinois that are in need of the greatest number of workers each year.

TABLE 2

Top 10 Health Occupation in Illinois in Greatest Need of Workers Annually (Payne, 2005)			
Occupation	Employment 2002	Employment 2012	Average Annual Job Openings
Registered nurses	99,073	118,049	3,971
Nursing aides, Orderlies/Attendants	53,086	64,023	1,789
Dental assistants	15,582	19,365	814
Licensed practical nurses	21,105	23,863	736
Home health aides	13,941	18,836	672
Medical assistants	9,450	13,657	596
Pharmacists	11,204	13,825	479
Pharmacy technicians	9,737	12,042	357
Medical & health services managers	8,669	10,478	350
Med. records & health info. technicians	6,287	8,580	319

State of HST: Need for Revitalization

Illinois Data

At present, compared with the need, a relatively low number of HST programs are offered in Illinois high schools. The following secondary CTE health science and technology training programs are operating throughout the State of Illinois in 51 of the 60 EFE regions:

TABLE 3

Program Type—CIP	# of EFE Systems Offering Program in FY05	# of Schools Offering Program in FY05	# of Student Participating in Program in FY05
Orientation-level—51.0000	33	43	1,746
Sign Language Interpreter—51.0205	2	2	36
Dental Assistant—51.0601	7	12	17
Dental Laboratory Aide—51.0604	1	1	1
Medical Records Technology/Technician Cluster— 51.0700	10	17	21
Health Unit Clerk—51.0703	3	3	3

Medical Assistant Cluster—51.0800	12	28	604
Pharmacy Technician/Assistant—51.0805	11	14	23
Physical Therapy Aide/Assistant—51.0806	9	9	10
Pharmacy Clerk—51.0809	9	10	10
Podiatric Assistant—51.0810	1	1	1
Chiropractic Assistant—51.0811	2	4	4
Emergency Medical Technology/Technician—51.0904	4	4	60
Radiologic Aide—51.0921	2	2	3
Central Supply Aide—51.0923	2	3	3
Diagnostic and Treatment Services—51.0924	1	1	68
Nursing Cluster—51.1600	47	116	2,915
Practical Nurse—51.1613	3	35	185
Nursing Assistant/Aide—51.1614	27	46	189
Home Health Aide—51.1615	4	4	4
Ophthalmic Cluster—51.1800	1	1	1
Optical Technician/Assistant—51.1802	2	2	2
Rehabilitation/Therapeutic Services Cluster—51.2300	1	1	1
Medical Laboratory Aide/Phlebotomist—51.2602	4	5	192
Geriatric Aide—51.2603	4	5	12
Therapeutic Recreation Aide/Assistant—51.2604	5	6	6
Activity Aide—51.2608	8	10	15
Health Occupations Multi-Cluster—51.9994	10	20	235
Total # of Students			6,367

Comparing TABLES 2 & 3 with the four most highly demanded health care occupations, as done in TABLE 4, it appears that numerous health care occupations in need of workers in Illinois may potentially receive a relatively small future supply. In order to avoid a possible future labor market crisis, it is imperative that schools offer CTE programs that correspond with local labor market demands and that students know the lucrative health care career options available to them.

TABLE 4

Occupation	Annual Need (Table 2)	Annual EFE Supply* (Table 3)	Annual % Difference
Nurse	3971	2915	27%
Nursing Assistant/Aide	1789	189	89%
Dental Assistant	814	17	98%
Practical Nurse	736	185	75%
* NOTE: Many programs may only operate every 2 years, as opposed to annually; therefore, the “Annual % Difference” may actually be under-estimated.			

Students need to know that in today's economy approximately 85% of jobs require some form of additional training or education beyond a high school diploma, and approximately 60% of the higher paying jobs require a degree from a technical institute or community college or completion of an apprenticeship program via a local union (McCage, 2005). In addition, labor market data illustrates that jobs requiring only an associate's degree are projected to grow at a rate (30%) that is more than double the overall employment growth rate (14%) through at least the year 2008, and only an associates degree or vocational certificate will be required for employment within approximately one-third of the fastest growing jobs (Silverberg, et al., 2004; Bureau of Labor Statistics, 2004).

Combining this information with the finding that 83% of people with an associate's degree have annual earnings comparable to people with a bachelor's degree (McCage, 2005) suggests that employment within a career requiring only an associate's degree or technical certificate may be advisable for many secondary students, as long as they are provided with such necessary information about labor market statistics, career choice, and the benefits of participating in a quality CTE HST program.

Factors Influencing Quality Curriculum

As a means to ensure quality within every K-12 school throughout the nation, the federal government adopted an initiative called H.R. 1, the *No Child Left Behind Act of 2001* (NCLB). The underlying premise of NCLB is that all students, regardless of geography, socioeconomic status, or any other notable factor, will receive an ample and appropriate education. Six primary goals of NCLB are as follows:

1. All students will reach high standards, at a minimum attaining proficiency or better in reading and mathematics by 2013-2014.
2. By 2013-2014, all students will be proficient in reading by the end of the third grade.
3. All limited English proficient students will become proficient in English
4. By 2005-2006, all students will be taught by highly qualified teachers.
5. All students will be educated in learning environments that are safe, drug free, and conducive to learning.
6. All students will graduate from high school.

Career and Technical Education has been instrumental in helping ensure that Goals 1 and 6 are achieved since participation in CTE positively correlates with improving academic performance and increasing graduation rates (Roberts, 2004). Of the four remaining goals, Goal 3, that all students will be taught by highly qualified teachers, is currently not applicable since CTE teachers have been deemed exempt from needing to meet this requirement. By nature of the certification requirements for CTE teachers, a ‘highly qualified’ status in the skill area in which they teach is already required since CTE teachers must complete, beyond the minimum post-secondary educational requirements, a minimum amount of industry work experience and industry licensure, certification, or registration, when appropriate.

How This Affects HST Teachers & Teacher Certification

To receive full certification as a Health Occupations teacher in Illinois, a prospective applicant must first complete an approved teacher education program and then receive an endorsement to teach Health Occupations by obtaining a State certificate or license that corresponds to the specialty area in which s/he has trained. If a person does not have a secondary teaching certificate, s/he can apply for a Provisional Career and Technical Education Certificate for Health Occupations. To receive a Provisional Certificate for HST, a prospective applicant must have (1) an official transcript showing 60 semester hours of credit from a recognized educational institution, (2) documented evidence of 2,000 hours of work experience in the skill area being taught, and (3) obtained licensure, registration, or certification in one of the health occupations specialty areas (Illinois State Board of Education, 2004). In relation to NCLB legislation and what specifically constitutes “highly qualified,” the federal government has provided some overall guidelines from which to work, but has left the ultimate task of determining whether a teacher has achieved “highly qualified” status in the hands of each State.

In Illinois for any secondary teacher providing instruction within a core academic subject (including science, arts, reading, English/language arts, history, civics and government, economics, geography, foreign language, and mathematics), the following criteria is used to identify “highly qualified” teachers (Illinois State Board of Education, 2005):

All teachers must...

1. Hold a Bachelor’s degree
2. Hold a certificate for the grade and subject without any waivers

3. Meet Illinois requirements for the assignment **and**
4. Meet any of the following options for each core subject taught at the secondary grade level (9th -12th):
 - Hold a secondary certificate and pass a state examination in the specific subject being taught
 - Hold a special certificate (or an elementary or secondary certificate obtained by splitting a special certificate) endorsed in the core area and teach only that core academic subject
 - Hold an advanced degree in a subject area and teach the area
 - Have a major in a subject, or 32 semester hours, and teach that subject
 - Hold a Master certificate in a subject for the secondary level and be assigned to teach that subject
 - Hold a secondary certificate and be assigned to an area where one of the new designations under the endorsement rules (effective 07/01/04) is met (i.e., must have either a major, or 32 semester hours of college credit, in the area of potential endorsement or must have 24 hours of college credit and pass a content test for each area of potential endorsement)
 - Hold an *elementary* certificate and teach a core subject at the ninth grade level and
 - ✓ Have a major in the subject indicated on a transcript (or have 32 hours of content in the subject) or
 - ✓ Have passed a content test in the subject or
 - ✓ Have a Master certificate for the grade and subject or
 - ✓ Have an advanced degree in the subject

Veteran teachers, or those who have taught for more than one year, who hold a secondary teaching certificate and want to be considered highly qualified in a subject area for which they do not meet the above-outlined criteria can apply for highly qualified status by documenting via the High Objective Uniform State Standard of Evaluation (HOUSSE) system 100 or more points of experience working within the subject area. For example, a certified history teacher who has met the criteria for highly qualified in history wants to continue to teach the political science class he has been teaching for the past 3 years; therefore, he needs to meet the criteria for highly qualified

to teach in the academic area of civics and government. Using the HOUSSE system, he could document 30 points, or 10 points per each year, for teaching political science (for a maximum of 50 points that can be earned this way); 45 points, or 15 points per annual conference, for the three political science conferences he has attended over the past 3 years; and 30 points, 10 points per year, for three years experience working as a lobbyist at the state-government prior to working as a secondary school teacher. HOUSSE is a point system that has been adopted by the State of Illinois and is currently used by the State to determine continuing professional development requirements for renewal of standard and master teaching certificates; therefore, teachers in Illinois should be familiar with the expectations associated with this option and should already be completing activities that can earn them “highly qualified” status. For “new” teachers, or those who have not completed one year of teaching, “highly qualified” will be demonstrated by passing a State examination (Illinois State Board of Education, 2005).

Although CTE teachers are considered exempt from needing to meet the requirements of “highly qualified,” this will not hold true if CTE teachers are teaching vocational courses for which students are receiving core academic subject credit. For example, if students are taking a Medical Anatomy and Physiology course as a necessary component of a school’s CTE health science and technology program and the course has been approved by the local school board to provide core academic science credit, then the CTE teacher must be “highly qualified” in science. Although, it should be noted that students currently do not need to be taught academic courses by highly qualified teachers in order to receive academic credit towards high school graduation because local school boards can still exercise the option of hiring non-highly qualified teachers to teach core academic courses. But, students who do take academic courses taught by non-highly qualified teachers could run the risk of post-secondary institutions not recognizing the academic credit since colleges and/or universities may chose not to accept credits earned in courses taught by non-highly qualified teachers. Illinois, like many States, is still struggling with how to most appropriately address “highly qualified” in order to provide the greatest overall benefit, not burden, to schools and students.

In addition to clarifying issues related to NCLB and “highly qualified teachers,” Illinois enacted legislation in April of 2005 that raised the number of academic credits necessary for high school graduation. More specifically, House Bill 0575 and Senate Bill 0575 outline these “higher standards” as follows:

“each student entering the 9th grade in the 2005-2006 school year must, in addition to other course requirements, successfully complete all of the following courses: 3 years of language arts; 3 years of mathematics; 1 year of science; 2 years of social studies, of which at least one year must be history of the United States or a combination of history of the United States and American government; and 1 year chosen from (A) music, (B) art, (c) foreign language, which shall be deemed to include American Sign Language, or (D) vocational education” (SB0575, 2005).

These requirements increase for all students entering the 9th grade in the 2008-2009 school year to include:

1. “4 years of language arts.
2. 2 years of writing intensive courses, one of which must be English and the other of which may be English or any other subject. When applicable, writing-intensive courses may be counted towards the fulfillment of other graduation requirements.
3. 3 years of mathematics, one of which must be Algebra I and one of which must include geometry content.
4. 2 years of science.
5. 2 years of social studies, of which at least one year must be history of the United States or a combination of history of the United States and American government.
6. 1 year chosen from (A) music, (B) art, (c) foreign language, which shall be deemed to include American Sign Language, or (D) vocational education” (SB0575, 2005).

The number of CTE students nationally completing the New Basics curriculum, or 4 years of English and 3 years each of Math, Science, and Social Studies, increased from 19% in 1990 to 51% in 2000 (Silverberg et al., 2004). Since the New Basics curriculum requirements exceed the maximum number of core academic credit requirements established by the Illinois legislature through the 2008-2009 school year, CTE students may already be performing beyond these future Illinois requirements. Despite the fact that CTE students appear to be participating in a relatively large number of core academic courses, CTE students deserve the opportunity to receive academic credit for CTE courses that address academic content to a degree comparable to what is addressed within an academic class. For example, if a student is taking Medical Anatomy and Physiology as a required piece within the CTE Emergency Medical Technician training program, then s/he should receive an academic science credit, as opposed to receiving

only an elective credit for completing a CTE course, since the depth and breadth of science content is addressed to a level similar to or beyond what would be addressed within an academic Advanced Biology/Anatomy class. Receiving academic credit within CTE courses is currently determined by local school boards, but federal and State legislation can greatly impact the overall movement towards or against this occurring more readily when merited. At a national level, CTE programs are currently being “evaluated,” in terms of the overall cost/benefit of their existence and programmatic changes that may need to occur, because fiscal year 2006 (FY06) is the last year of operation under the Carl D. Perkins Vocational and Applied Technology Education Act of 1998.

On March 10, 2005, the United States Senate passed the “Carl D. Perkins Career and Technical Education Improvement Act of 2005,” and the United States House approved the “Vocational and Technical Education for the Future Act” on May 4, 2005. Despite the fact that both branches of Congress have passed bills reauthorizing the “Carl D. Perkins Vocational and Applied Technology Education Act of 1998” (i.e., Perkins III), a “consensus” bill that merges specifics associated with each separate bill needs to pass through both the House and Senate prior to official reauthorization and continued funding for Perkins. The driving goal behind the Perkins legislation (1984, 1990, & 1998) has been to ensure a robust economy through a prepared workforce, and each reauthorization has built on this goal by initially addressing or re-emphasizing the need for CTE programs to integrate academic and vocational instruction, link secondary and postsecondary programs, collaborate with employers, expand the use of technology, and establish accountability requirements for each state. Perkins III (1998) required each state to set performance levels for student achievement and to “measure” the degree to which these levels are met. In Illinois, data pertaining to four student outcomes, CTE graduation rates, postsecondary education and employment, employability skills, and nontraditional student participation in CTE programs, are tracked and reported annually. This data can impact CTE funding at the federal level, where Illinois’ progress is compared to that of other states, down to the local levels, where it may be used to determine which programs should be eliminated or added.

Perkins accountability requirements and the current reauthorization process, NCLB and higher standards for State goals, critical worker shortage areas, empirical research regarding CTE outcomes, and many other factors have provoked an increased awareness of the vital role CTE

has in continuing to provide students with a means to achieve in secondary and post-secondary education and/or training and in life. This increased awareness and validation of the importance and need for CTE has prompted many States to look at the quality, structure, and elements of their local CTE programs, which has subsequently spurred a growing awareness and “adoption” of the National Knowledge and Skill Standards discussed previously.

Schools with Exemplary HST Programs

The Career and Technical Education Consortium (i.e., CareerTEC) in Freeport, Illinois, and schools within the Eastern Illinois Education for Employment System (i.e., the Regional Health Occupation Program--RHOP) have HST programs that adhere to the National Knowledge and Skill Standards. At CareerTEC, this is illustrated within the “Health Occupations Youth Apprenticeship DACUM” document where the local health care core skill standards, which the curriculum was designed to address, are organized according to the 11 National Knowledge and Skill Standards. Within the RHOP, six HST instructors working in each of the four hospitals where CTE HST education occurs conducted a gap analysis using the 11 National Knowledge and Skills Standards and confirmed their curriculum was/is comprehensively addressing these Standards down to the performance descriptor level. Despite the fact that both of these programs already address the National Knowledge and Skill Standards to an appropriate degree, CareerTEC and RHOP were also judged as relatively exemplary since these programs allow students to investigate multiple careers within the health care industry, while still providing them with the knowledge and skills required to take the Certified Nursing Assistant (CNA) exam, within 2 years and 1 year, respectively.

Being able to complete a quality, useful program in the shortest time possible while still being able to acquire all the potential benefits, such as licensure or certification, is desirable to any student. But, a cost/benefit analysis that is predicated on “time” may be more necessary now than ever before due to the requirements and expectations of NCLB and Illinois’ Higher Standards. Within the current educational climate that is being highly influenced by NCLB and increased graduation requirements, more demands are being placed on students in terms of which courses, how many credit hours, and what level of performance is necessary to successfully complete a secondary education and earn a high school diploma. Because of this, students need programs and/or courses that provide them with usable skills and knowledge, while allowing

them to fulfill academic course requirements and receive good grades. CareerTEC and RHOP both have state-wide reputations for actively advocating to ensure these benefits are available to students participating in their stellar programs. EFE System Directors, the HST affiliate organizations (i.e. Illinois Health Occupations Students of America—IHOSA and Illinois Health Occupations Association—IHOA), the former ISBE Health Occupations Consultant (i.e., Kathryn Torricelli), educational personnel, and health care businesses throughout the State who have been solicited via e-mail, mail, phone, or face-to-face for comments about which Illinois health occupations programs are exemplary have consistently identified CareerTEC and RHOP as quality programs that benefit the student, the school, and the surrounding business community.

Other programs that have been identified as exemplary via the above-mentioned solicitations include Central Community High School in Breese, Illinois; School District U-46 consisting of Elgin, Larkin, Streamwood, and Bartlett High Schools; West Aurora High School in Aurora, Illinois; Southeast Health Science Career Academy in Springfield, Illinois; Grundy Area Vocational Center in Morris, Illinois; the Technology Center of DuPage in DuPage, Illinois; and Centralia High School in Centralia, Illinois. Although these programs differ dramatically in what they teach, how they teach, and to whom they teach, an informed and motivated teacher is consistently identified across these programs. But, not all schools have the good fortune of hiring an informed and motivated HST teacher, just as all schools don't have the good fortune of hiring an informed and motivated algebra or English teacher; therefore, what and how these teachers do must be "objectified" as much as possible in order to ensure that the knowledge and skills of the student are not predominantly predicated on the knowledge and skills of the teacher. More specifically, students, teachers, schools, and business/industry deserve an assurance that what is being taught and learned in a HST nursing cluster program in Alton, Illinois, is comparable in depth and breadth to what is being taught and learned in a HST nursing cluster program in Rockford, Illinois, regardless of the teacher.

One may argue that this "assurance" already exists as much as it can since nursing programs wanting to provide their students with the opportunity to take the exam to become a Certified Nursing Assistant must follow the curriculum regulated through the Illinois Department of Public Health (IDPH). But, IDPH does not offer an actual curriculum for training CNAs; instead, they provide mandated guidelines that cover 27 "modules" or units of training arranged

in outline form with a list of topics to be covered. Educators report that a combination of commercial textbooks, videos, and local health care facilities with whom partnerships have been established, are used to teach the content outlined within the IDPH guidelines; therefore, programs can differ dramatically in the depth and breadth of what is addressed.

In a survey conducted during the second quarter of 2005 to which approximately 50% of the 60 EFE System Directors responded, HST secondary curriculum materials identified as most frequently used across all HST CTE programs in Illinois were the following:

1. Introduction to Health Occupations by Badasch & Chesbro
2. Mosby's Textbook for Nursing Assistants by Sorrentino
3. Diversified Health Occupations by Simmers
4. Health Careers Today by Gerdin

Mosby's Textbook for Nursing Assistants (2003) by Sorrentino and Code Blue (2003) by McDermott and Stocks are used in the RHOP program. This program has been identified as the most exemplary since it enables students to potentially do all of the following: (1) to complete the competencies in basic nursing skills required by IDPH (i.e., 80 hours of theory, 40 hours of clinical instruction, and demonstrated competency in the 21 performance skills), (2) to explore multiple allied health care careers via participation in nine weeks of job shadowing and externship, (3) to earn eight community college credits and (4) two high school credits (i.e., the latter are elective credits currently, but steps are being taken to offer academic science credit), and (5) to participate for only 1 school year. RHOP has 6 instructors working within 4 hospitals located in southeastern Illinois, and these instructors teach 3, 2 hour blocks per day. Classes meet approximately 2 hours each school day, with the first 6 weeks being spent entirely in a classroom setting where students learn the necessary foundational knowledge and practice the fundamental clinical skills, such as bathing, vitals, feeding, etc., on each other. Beginning in mid-October and through to the end of February, students spend 2 days/week in a clinical setting, of which 1 to 2 weeks occur within a long-term care facility. During the last nine weeks of the school year, students select four to five areas within the health care field that interest them and spend 5 days/week for 1 to 1 ½ weeks working within each of these areas. The last four weeks are devoted to the area of health care in which the student is most interested, with the student working in this area 5 days/week. Given this opportunity for students to receive in-depth exposure to more than one health care occupation, many students participating in the RHOP

program receive more than one certification, such as Certified Nursing Assistant and Pharmacy Technician or Emergency Medical Technician, upon completion of the program. No other HST program in the State affords these benefits to Juniors and/or Seniors during only 1 school year.

Summary, Further Considerations, and Conclusions

As stated above, time is of the essence in secondary education since students today must achieve at unprecedented levels in both quality and quantity in order to earn a high school diploma and become a productive, self-supporting citizen. Health care is an industry with multiple opportunities for students to earn wages that could enable them to become productive, self-supporting citizens with little investment in time and money since many of these lucrative health care opportunities require only an associate's degree or a technical certificate.

The future health of American society is predicated on the need to make students aware of these opportunities since the current health care worker shortage in the United States is projected to grow astronomically within the next 10 years. Without technicians and practitioners to provide the care needed, morbidity and mortality rates could dramatically increase, despite the technical advances in the health care field that denote these rates should only continue to decline across time.

The health care worker shortage is a controllable variable that is not predicated on advances within the scientific communities, but is instead predicated on “advances” within the educational community. These advances equate to making elementary and middle school students informed about health care career choices and to providing a means for secondary students to make notable strides towards employment within health care careers. In relation to the latter, the HST CRI has been working towards devising a uniform secondary HST curriculum that can be used throughout the State of Illinois to provide students with the knowledge and skills necessary for employment within the health care field.

HST CRI Teacher Workgroup

HST CTE teachers, by nature of meeting requirement to teach within this area, are trained practitioners within the health care field, with the majority of them licensed as registered nurses (i.e., RN). Six of these HST teachers were identified by the affiliate organizations (i.e. Illinois Health Occupations Association and Illinois Health Occupations Student Association) as

exceptional teachers and practitioners working throughout Illinois at various HST secondary programs, and these individuals currently comprise the HST CRI Teacher Workgroup. This Workgroup has been charged with the responsibility of guiding the outcomes of the HST CRI because a fundamental requirement of the Curriculum Revitalization Initiative includes the need for it to be teacher-driven and bottom-up, rather than administratively-driven and top-down, to assure greater implementation. In meeting this responsibility, the HST Teacher Workgroup has been working towards creating a curriculum package that does the following:

- (1) includes (at a minimum) (a) lesson plans, (b) PowerPoints, and (c) assessments;
- (2) can be used as a stand-alone curriculum to teach the fundamental knowledge and skills needed for employment within any health care occupation;
- (3) meets the requirements of the basic nursing assistant training program administered through IDPH;
- (4) adheres to and incorporates the (a) National Knowledge and Skill Standards, (b) Illinois State Goals, Learning Standards, and Performance Descriptors, (c) Occupational Skill Standards, and (d) Workplace Skills;
- (5) can provide academic credit;
- (6) supports the tenets of NCLB;
- (7) can be used in *any* secondary educational setting

This curriculum package will be made available to teachers via compact disk (CD) and the Internet, and it will include the following Units of Instruction:

- (1) Health Care Systems, including payment systems, history of health care, and history of health science
- (2) Career Exploration
- (3) The Health Care Worker, including employability skills, diversity, interpersonal relationships, and teamwork
- (4) Ethics and Legal Issues
- (5) Communication, including oral & written, policies & procedures, medical math, medical terminology, and computer technology
- (6) Human Structure and Function, including the 10 body systems and diseases & disorders
- (7) Growth and Development, including conception to death

- (8) Nutrition
- (9) Safety
- (10) Infection Control, including microorganisms
- (11) Physical Assessment
- (12) Wellness

Resources being used include the following:

1. National Health Science Career Cluster Foundation Knowledge and Skill Standards
2. Curriculum materials from South Carolina, Texas, Utah, and Virginia
3. Curriculum materials from the Illinois schools identified as exemplary
4. Curriculum materials from the educational institutions where each of the HST Teacher Workgroup members are employed
5. Four textbooks identified as most frequently used throughout the State of Illinois.

With a clearly defined plan, the HST Curriculum Revitalization Initiative is positioned to proceed more swiftly and aptly towards achieving its goals during the latter half of FY 06. Public awareness, endorsement, and support that has been provided by the Governor's Office, the Illinois State Board of Education, the Education for Employment System Directors, the Illinois Community College Board, the Illinois Workforce Investment Board, the Illinois Department of Commerce and Economic Opportunity, school administrators, educators, and business and industry will need to continue into the future so a seamless K-16 pipeline for HST career awareness and selection can exist.

Systemic Issues Influencing the Goals of the HST CRI

Some systemic issues that are beyond the control of the HST CRI could compromise Illinois' ability to provide future health care workers, and these include (1) teacher certification, (2) the secondary to post-secondary transition, and (3) the requirement of an orientation-level course. In relation to the latter, current HST program requirements administered by the Illinois State Board of Education, Division of Career and Technical Education state that a CTE program must offer an orientation-level course in order to qualify as an approved, and therefore fundable, program. But, in the area of Health Science and Technology, ISBE has and should continue to be flexible in requiring an orientation-level course for program approval, for the sake of the economy, students, and logic.

In relation to the economy, some programs would no longer exist or would function as unapproved programs if an orientation-level course was strictly required since some smaller, feeder schools may not be able to absorb the cost of hiring a teacher and providing a classroom for the benefit of few to no students being enrolled in the orientation-level course each semester. Given the extreme demand for health care workers and the large percentage of health care workers who return to or near their hometowns to work, the local economy could feel a future effect if even one HST CTE program ceased to exist. In relation to students who have a limited number of elective credits, it seems of little benefit to offer a semester long, ½ credit orientation-level course when students can glean the same information via participation in a year long, 1 credit skill-level course where employable skills and certification can be obtained. In terms of logic, the HST orientation-level material is more homogeneous, as opposed to heterogeneous, across all health care occupations, relative to the orientation-level material in Agricultural Education or Industrial Technology. More specifically, in HST education, a student wanting to be a nurse and a student wanting to be a medical records technician will both need to know and understand the same basic health care jargon and how health care facilities function. But, in Agricultural Education, a student wanting to be a horticulturist and a student wanting to be a mechanic will need to know and understand very different jargons and very different functions of their work environments.

Precedents show that ISBE understands factors precluding the need for a HST orientation-level course, especially when orientation-level material is consistently and necessarily infused into skill-level courses, since ISBE has shown great flexibility in waiving this requirement. This flexibility has helped poise HST CTE programs to increase in number, rather than to cease to exist. In addition to program requirements, student enrollments also influence the existence or demise of CTE programs. For example, many students who enrolled in and completed a secondary HST CTE program as the logical first step towards pursuing a health care career within a timely fashion have waited on the doorstep of post-secondary training and/or education for 2 to 3 years, and these same students have often returned to their home schools to share the “bad news” with other current and prospective HST CTE students.

Once again for the sake of the economy, students, and fairness, ISBE, the Illinois Community College Board, and any other influential and necessary entity must work together to negotiate solutions to students being placed on waiting lists for 2 or more years since many of

these students get tired of waiting and move on to other careers. Some “possible solutions” to these waiting lists include increasing the number of post-secondary training personnel and facilities in existence via partnerships with the HST businesses and industries that are in high demand of qualified workers; creating articulation agreements that reserve a certain number of spots for HST CTE program completers; negotiating more dual credit options with more post-secondary training institutions in order to expand students’ choices of where they can attend; etc. From a statewide perspective, all of these possible solutions appear more readily attainable on a much larger scale if a uniform or model curriculum, as opposed to hundreds of different curriculums, is being used in secondary HST education throughout Illinois.

A uniform or model curriculum would also be beneficial in negotiating for academic credit to be awarded to students participating in HST programs. Since local school boards ultimately determine if a course or program contains enough academic material to merit academic credit, successful negotiations at one school can be used as a precedent for successful negotiations at another/other schools. HST CTE enables students to link abstract academic concepts to real-life situations and to apply those concepts within a hand-on, career oriented venue, which is the same educational method used to train medical doctors and residents. By nature of what CTE is and does, students are learning and using academic content, and in the area of HST, it is evident in the name that the academic content being learned and used most readily relates to science.

Despite the overwhelming evidence to support HST CTE courses are primed to provide students with science, and most likely math credit, most students will not be able to use these credits if continuing on to post-secondary education since the majority of HST teachers are provisionally, as opposed to fully, certified and therefore are not considered highly qualified. The future of HST program participation is predicated on the ISBE clarifying a means by which students being taught by provisionally certified HST CTE teachers can receive academic credit. Two suggestions toward achieving this include the following:

- negotiate with community colleges and universities offering teacher training programs for people who already have a Bachelor degree to allow the student teaching component to occur while HST CTE teachers are employed within their current positions.
- allow HST CTE teachers to “team teach” with a highly qualified academic content teacher who would be the teacher of record, and allow the requirements defining “team

teaching” to reflect a supervisory, rather than an apprenticeship, format. More specifically, the teacher of record should not have to be present to teach the academic material since the HST CTE teacher is more than qualified to teach the academic material as evidenced by the licensure and/or certification s/he has obtained. Instead, the academic and HST CTE teachers should be expected to meet weekly to bi-monthly to go over the lesson plans together to ensure the HST CTE teacher knows the content s/he will be teaching and the academic teacher provides any necessary oversight. This supervisory arrangement of weekly to bi-monthly meetings between a non-licensed/certified health care worker and a licensed/certified health care worker is used throughout the health care industry when fulfilling the required number of supervised hours for licensure eligibility.

The future existence and growth of secondary HST CTE programs in Illinois are predicated on the number and size of the benefits being gained by students, teachers, and administrators at the minimal possible cost in time, money, and wasted energy. Achieving benefits while minimizing costs will require, at a minimum, the use of quality curriculum materials, flexibility in program requirements, active recruitment and retention of teachers, the ability to award academic and dual credit when appropriate, and the opportunity for timely transition into post-secondary education and training programs. Accomplishing these things will require concerted effort from all levels of the educational system and from business, industry, and labor.

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Appendix A
National CTE Health Occupations Programs
[Completed June 2005]

State	Comments
Alabama	http://www.jackson.k12.al.us/EPCOT/Course_Study/hst_cos.htm <ul style="list-style-type: none"> ➤ 16 courses that prescribe the required minimum content in the area of healthcare for students in grades 9-12 ➤ Entire curriculum available via web site.
Alaska	http://www.eed.state.ak.us/tls/CTE/cluster_health.html <ul style="list-style-type: none"> ➤ Nothing via web beyond links to national resources
Arizona	http://www.ade.az.gov/cte/HCE/update.asp <ul style="list-style-type: none"> ➤ “The new Allied Health Services program is in the development process”
Arkansas	http://dwe.arkansas.gov/CTESecondaryCareer&TechEd.htm <ul style="list-style-type: none"> ➤ Nothing via web for health occupations
California	http://www.cde.ca.gov/ci/ct/hc <ul style="list-style-type: none"> ➤ Nothing via web for health occupations beyond links to related state and national organizations
Colorado	http://www.cde.state.co.us/index_home.htm <ul style="list-style-type: none"> ➤ Nothing via web for health occupations
Connecticut	http://www.state.ct.us/sde/deps/Career/Med/index.htm#Publications/Forms%20and%20Reports <ul style="list-style-type: none"> ➤ Nothing via web for “Medical Careers Education” available yet since content is reportedly in the process of being developed; therefore, only links to national resources are currently available
Delaware	http://www.doe.state.de.us/CTSO_Site/CTSOHomepage.htm <ul style="list-style-type: none"> ➤ Nothing via web for health occupations
Florida	http://myfloridaeducation.com/programs/health.htm <ul style="list-style-type: none"> ➤ “2005-2006 Health Science Education: Career Education Curriculum Frameworks” ➤ Entire Curriculum available via web site—42 frameworks
Georgia	http://www.glc.k12.ga.us/passwd/search/srchqcc/LessonPlans_pnp.asp?TxPartner=HST&CallType=LP&RAID=12&VIEW=SO&IMAGE1.x=18&IMAGE1.y=17&PartnerPath=GACTSP&Subject=Healthcare+Science+Technology&subjectid=18&Grade=9-12 <ul style="list-style-type: none"> ➤ “Grade 9-12 Healthcare Science Technology: Quality Core Curriculum Lesson Plans” (56 of these) ➤ Entire Curriculum available via web site
Hawaii	http://www.hawaii.edu/cte/ <ul style="list-style-type: none"> ➤ Nothing via web for health occupations, except a list of potential occupations in the health care field
Idaho	http://www.ptc.state.id.us/hp/h_cur.htm#Active%20Table <ul style="list-style-type: none"> ➤ Not much available in relation to secondary health occupations programs since the majority of information provided relates to post-secondary health occupations programs
Indiana	http://doe.state.in.us/octe/health/hce/descrip.html <ul style="list-style-type: none"> ➤ Have 22 state-approved course titles with corresponding general descriptions of suggested content
Iowa	http://www.state.ia.us/educate/ccwp/ct/ho.html

	<ul style="list-style-type: none"> ➤ Have “content standards and benchmarks” only
Kansas	http://www.ksde.org/sfp/cate/cate.htm <ul style="list-style-type: none"> ➤ Have “Health Care Core Standards and Competencies” only
Kentucky	http://www.education.ky.gov/KDE/Instructional+Resources/Career+and+Technical+Education/Career+and+Technical+Education+Programs/Health+Science.htm <ul style="list-style-type: none"> ➤ Have 9 courses in Health Science Program with basic frameworks
Louisiana	http://www.doe.state.la.us/lde/family/518.html <ul style="list-style-type: none"> ➤ Have a “Health Occupations Content Standards and Curriculum Framework” document and course descriptions for 23 state-approved courses available, but these are only guidelines at most
Maine	http://www.maine.gov/education/cp/cpindex.htm <ul style="list-style-type: none"> ➤ Have a CNA program only—includes a # of resources for developing the Career Preparation Assessment Notebook
Maryland	http://www.marylandpublicschools.org/MSDE/divisions/careertech/ <ul style="list-style-type: none"> ➤ Nothing via web, except an interesting 52 page booklet on career clusters
Massachusetts	http://www.mccte.org/frameworks/web/fw_templates/frameworks_index.htm <ul style="list-style-type: none"> ➤ Have curriculum frameworks for 6 instructional program areas, but these are described as “works in progress” and are part of the overall Certificate of Occupational Proficiency project ➤ Have an online library much like IOES
Michigan	http://www.michigan.gov/mdcd/0,1607,7-122-1680_2629---,00.html <ul style="list-style-type: none"> ➤ Have skill checklists for multiple careers within Health Sciences, but no frameworks or lesson plans
Minnesota	http://education.state.mn.us/html/mde_home.htm <ul style="list-style-type: none"> ➤ Have Agricultural CTE program only
Mississippi	http://www.mde.k12.ms.us/vocational/curriculum/secondary.htm <ul style="list-style-type: none"> ➤ Most updated curriculum information available via web relates to the year 2000 ➤ Sandra Bates, Program Coordinator of Health Science Technology—provided updated curriculum copy via mail : sbates@mde.k12.ms.us <ul style="list-style-type: none"> --Have Allied Health 1 & 2 & each includes Academic, Work- place for the 21st Century, National Ed. Tech., & National Health Care Skill Standards; also Student Competency Profiles
Missouri	http://www.dese.mo.gov/divcareered/competency_profiles_health.htm <ul style="list-style-type: none"> ➤ Have competency profiles for 24 career paths that fall within 4 areas (Health Services Assistant programs, Adult programs, Post-Secondary programs, and Certified Medication Technician program)
Montana	http://www.opi.state.mt.us/CTE/HealthOccup.html <ul style="list-style-type: none"> ➤ Nothing via web for health occupations
Nebraska	http://www.nde.state.ne.us/nce/cteprogams.htm <ul style="list-style-type: none"> ➤ Nothing via web for health occupations
Nevada	http://www.doe.nv.gov <ul style="list-style-type: none"> ➤ Nothing via web for health occupations
New Hampshire	http://www.ed.state.nh.us/education/doe/organization/adultlearning/Career%20Development/productsavailable.htm <ul style="list-style-type: none"> ➤ Nothing via web for health occupations
New Jersey	http://www.nj.gov/njded/voc/about.htm <ul style="list-style-type: none"> ➤ Nothing via web for health occupations
New Mexico	Web site not responding
New York	http://www.nysed.gov/

	<ul style="list-style-type: none"> ➤ Nothing via web for health occupations thru State Education Department http://www.cnyahec.org ➤ Have health science curriculum materials available for sale through Terry Gefell, Director, at Central New York Area Health Education Center
North Carolina	<p>http://www.ncpublicschools.org/workforce_development/publications/career_pathways/a_health_path.html</p> <ul style="list-style-type: none"> ➤ Have very general frameworks that include an example of a 9-12 course sequence and a list of careers falling within each of 5 pathways (i.e., these pathways do not mimic the 5 nationally established pathways) <p>http://www.ctenc.org</p> <ul style="list-style-type: none"> ➤ Have 8 courses with content outlines available thru Martini Print Media, Inc.—in the process of putting these materials online at this address
North Dakota	<p>http://www.dpi.state.nd.us/resource/corscode/index.shtm</p> <ul style="list-style-type: none"> ➤ Have course codes and brief descriptions only
Ohio	<p>http://www.ode.state.oh.us/ctae/Default.asp?pfv=true</p> <ul style="list-style-type: none"> ➤ Nothing via web for health occupations
Oklahoma	<p>http://www.okcareertech.org/cimc/downloads/hoec/hcc</p> <ul style="list-style-type: none"> ➤ Have Instructional Modules relating to 21 health careers, but these are currently available in hard copy only—have placed these on a CD that is currently being revised, but will eventually be available for purchase
Oregon	<p>http://www.ode.state.or.us/</p> <ul style="list-style-type: none"> ➤ Nothing via web for health occupations
Pennsylvania	<p>http://www.pde.state.pa.us/career_edu/cwp/view.asp?A=115&Q=59223</p> <ul style="list-style-type: none"> ➤ Have a Nursing Aid program only—includes curriculum content and performance checklists
Rhode Island	<p>http://www.ridoe.net/careerdev/careerdevelopment.htm</p> <ul style="list-style-type: none"> ➤ Nothing via web for health occupations
South Carolina	<p>http://www.myscschools.com/offices/cate/health_sciences/HSTETeacherResourceGuide</p> <ul style="list-style-type: none"> ➤ Have curriculum standards for 12 courses ➤ Have a Teacher Resource Guide for each of the 2 core courses, and these Guides include program standards, lesson plans, activities, & PowerPoint presentations --2 core courses and 3 other courses have the 11 National Health Science Foundation Standards as their frameworks
South Dakota	<p>http://www.state.sd.us/deca/DWCP/healthoc/curriculum/index.htm</p> <ul style="list-style-type: none"> ➤ Have content standards for 5 courses
Tennessee	<p>http://www.state.tn.us/education/vehscurr.htm</p> <ul style="list-style-type: none"> ➤ Have Course Standards, Student Competency Profiles, Class Competency Profiles, and additional content suggestions for 10 courses
Texas	<p>http://www.texashste.com or http://www.texashotjobs.org</p> <ul style="list-style-type: none"> ➤ Have “21st Century Nursing Careers,” “2003 Curriculum Resources,” “2003 Radiology Tour,” “2003 Pharmacy Tour,” & “Hot Jobs” available online or on CD via mail and each incorporates Texas & National knowledge and skill standards
Utah	<p>http://www.usoe.k12.ut.us/ate/Skills/HSTTests.htm</p> <ul style="list-style-type: none"> ➤ Being revised
Vermont	<p>suzanneleblanc@education.state.vt.us</p> <ul style="list-style-type: none"> ➤ Have “Pathways/Competencies, and Task Lists” available via mail
Virginia	<p>http://www.cteresource.org</p> <ul style="list-style-type: none"> ➤ Have Student Competency Record (SCR), Task list (backbone of the Framework), Smart Links, Lesson Plans, Workplace Readiness Skills, and Career Connections for

	multiple topics related to health occupations
Washington	http://www.k12.wa.us/CareerTechEd/pathways/HealthHumanSrv/HealthSciences.aspx <ul style="list-style-type: none"> ➤ Nothing via web for health occupations, with the exception of a PowerPoint presentation entitled “Careers in the Health Sciences: Education in Washington K-12 Schools”
West Virginia	http://wvde.state.wv.us/policies/p2520.13/Health%20Occupations <ul style="list-style-type: none"> ➤ Have content standards and objectives for 27 courses
Wisconsin	http://www.dpi.state.wi.us/dpi/dlsis/let/hoehome.html <ul style="list-style-type: none"> ➤ Have skill standard checklists, some course outlines that may include suggestions for activities and assessment, and a “Scope and Sequence” brochure ➤ Have a Health Career Awareness document available for purchase via website
Wyoming	http://www.k12.wy.us/ctde.asp <ul style="list-style-type: none"> ➤ Nothing via web for health occupations, but have a good RFP entitled “Carl D. Perkins Vocational and Technical Education Continuation Act of 1998: Request for competitive proposals—03/2004”

Appendix B

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Appendix C

Lesson A1:

Unit A.

Problem Area.

Lesson 1.

Illinois State Goal and Learning Standard.

State Goal:

Learning Standard:

Performance Descriptor:

Skill Standard(s):

Workplace Skill(s):

Student Learning Objectives. Instruction in this lesson should result in students achieving the following objectives:

1.

List of Resources.

Recommended Resources.

Other Resources.

List of Equipment, Tools, Supplies, and Facilities.

Terms. The following terms are presented in this lesson (shown in bold italics):

Interest Approach. Use an interest approach that will prepare the students for the lesson.

Summary of Content and Teaching Strategies

Objective 1:

Objective 2:

Objective 3:

Objective 4:

Anticipated Problem

Review/Summary.

Application. Select from any or all of the following activities:

Evaluation. Evaluation should be based on student comprehension of the learning objectives.

Appendix D

Health Science & Technology Curriculum Revitalization Initiative Business, Industry, and Labor Advisory Council

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Appendix E

Legislation and Other Government Actions that have Impacted Support of Career and Technical Education

Dates	Act/Event	History/Impact
1862	Morrill Act (Land-Grant Act)	Endowed higher education for the inclusion of agriculture and mechanic arts. University of Illinois, Iowa State, University of Florida, Kansas State, Texas A and M, and Purdue are land-grant universities. For a complete list of Land-grant colleges go to http://www.ifas.ufl.edu/www/ls_grant/lgmembers.htm
1879	Manual Training School were developed for Secondary Students	The Manual Training School of Washington University (St. Louis) was the first in the U.S. Manual training was to be an enhancement to the traditional curriculum, not a replacement, and would thereby help achieve the full development and potential of the individual. The student would learn to skillfully use tools in drafting, mechanics, wood or metalworking and then would be able to transfer this knowledge to almost any kind of tool or setting. By 1910 100 cities had manual training high schools and by 1915 manual training had become an accepted part of the public secondary education. The Chicago Manual Training School was the 2 nd in the nation opening in 1884 supported by the Commercial Club of America. Lane Manual Training High School (now Lane Tech) was the first public manual school; it opened in the fall of 1909. Girls were not admitted until 1971. In the early years it was recognized that students needed strong academic skills as well as the vocational skills.
1884	Integration of Vocational Education into general high schools	Records indicate that the first general high school to integrate manual training into the regular curriculum was in Peru, IL. This became the first comprehensive high school. By 1893 comprehensive high schools existed in more than 50 cities and by 1900 the number had more than doubled.
1835	Vocational Education in Elementary Schools	Boston was the first city to incorporate practical instruction into the elementary curriculum. Two schools in Boston incorporated sewing and knitting for girls in 1835. In 1848 drawing was made a requirement for both boys and girls. The general Court of Massachusetts legalized/required the introduction to practical learning in all public schools in 1872. The first textbook written specifically for junior high industrial arts was <i>Essentials of Woodworking</i> (1908) written by a teacher in Oak Park, IL.
1839	Development of Normal Schools	Two-year teacher training schools were started and became a requirement for teachers teaching in public schools. Prior to this, teachers just needed to be able to stay ahead of their students – no education required. ISU was originally the Illinois State Normal School the later became Illinois State Teachers College and finally Illinois State University. Purpose of the normal schools was the need to educate for social, economic, democratic and national reasons. Courses for manual training teachers were added in 1893. In some states a “normal degree” was all that was needed for elementary teachers into the 70’s. Illinois started funding state normal schools in 1857.
1879	Kindergarten	Manual training was first recognized in 1876 when a teacher had students develop a kitchen garden in New York City.
1899	John Dewey Supports Industrial Arts	In <i>School and Society</i> , John Dewey placed industrial occupations at the very center of the elementary school curriculum. He saw the value of this curriculum as being the basis for instruction in the more traditional subjects – reading, writing, arithmetic, history, science, etc. The University Elementary School in Chicago brought his philosophy to the attention of the forward-looking schoolman. This led to the change from the term “manual

		training” (preparing for a field or job) to “industrial arts” which denoted an emphasis on industry rather than specific arts.
1906	Douglas Commission (Massachusetts)	Findings of the Commission included: a. Elementary schools should include (for both boys and girls) instruction in industry, agriculture, mechanic and domestic arts. b. Provision of elective industrial courses in high schools; evening courses for those already employed in trades; classes for 14 to 18 year olds already employed for part of the day.
1906	National Society for the Promotion of Industrial Education of 1906	1. Educators, manufacturers, mechanics, businessmen and representatives of other occupations brought public attention to the importance of industrial education. 2. In 1912, Charles A. Prosser became secretary of the society; he campaigned actively for federal aid for vocational education. 3. The society helped to secure the appointment of the National Commission on Federal Aid to Vocational Education in 1914 (this later became the American Vocational Association).
1911	Page Bill of 1911	1. Provided funds for branch experimental stations in high schools and land grant colleges. 2. Provided funds for preparing teachers of vocational subjects.
1911	State Marine School Act of 1911	1. Provided training for those planning a seafaring career. 2. Included the principle of matching federal aid with state and local funds.
1914	Smith Lever Act of 1914	1. President appointed a national commission to study federal aid to vocational education. 2. Established guidelines for future legislation on federal aid to vocational education.
1914	Commission on National Aid to Vocational Education of 1914	1. The report of this commission formed the basis of the Smith-Hughes Act of 1917 2. Recommendations of the Commission a. A national plan for vocational education b. Training teachers of trade and industrial subjects, agriculture and home economics c. Pay part of the salaries of teachers of agriculture and of trade and industrial subjects. d. Provide aid for day school, part-time school and evening schools. These schools were to be controlled by the public, operate at less than a college level and prepare participants for useful employment.
1917	The National Vocational Education (J. Smith-Hughes) Act	To promote vocational education, provide for cooperation among the states in promoting vocational education, and regulate the expenditure of money appropriated for these purposes. 1. The money appropriated annually under the act was 7.2 million; the appropriation was on a continuing basis. 2. Act stressed cooperation with the states in order to avoid federal control. 3. Home economics was included under the trade and industrial sections of the act. 4. Instruction under the act was under public control. 5. The purpose of instruction was to fit students for useful employment. 6. Education was provided for those over 14 years of age who were preparing to enter work in specific fields (provided at less than college level). 7. State and local community to provide necessary plants and equipment. 8. Teachers and supervisors to possess minimum qualifications. 9. Federal funds matched by state or local funds. 10. Establishment of a federal board for vocational education.

		<p>11. Required state boards and state plans.</p> <p>12. Required the following: six months of supervised practice in agriculture; 30 hours a week for full-time students; 144 hours a year for part-time students in trades and industries and home economics.</p> <p>13. Provisions later extended to Hawaii and Puerto Rico.</p>
1918	University Degree for Teachers	Increasing demand that all high school teachers have at least a Bachelor's Degree influenced universities to develop education degree programs. These did not become prominent until 1918.
1929	George-Reed Act of 1929	<p>1. Development of home economics and agriculture only.</p> <p>2. Removed home economics from trade and industrial sections of the Smith-Hughes Act.</p> <p>3. Five year time limit; authorization for annual appropriations, not an appropriation.</p>
1936	George-Deen Act of 1936	<p>1. Annual authorization for appropriations on a continuing basis.</p> <p>2. Added distributive occupations; specific funds were provided.</p> <p>3. More liberal than other acts; included funds for travel of supervisors.</p>
1946	George-Barden Act of 1946	<p>1. Amendment of George-Deen Act.</p> <p>2. Authorized 34 million for programs specified in the George-Deen Act.</p> <p>3. Flexible on how funds could be used; state boards could use whatever funds were deemed necessary within each of four fields of vocational education.</p> <p>4. Funds made available for salary and expenses for state director of vocational education and vocational counselors.</p> <p>5. Funds made available for the following: training and work experience programs; out of school youth; purchase or rental of equipment for vocational instruction.</p>
1963	The Vocational Education Act of 1963	And the 1968 Amendments provided for redirection, revitalization, and expansion of vocational education. It broadened vocational education to include research, curriculum development, personnel and leadership development, cooperative education, and work-study. The legislation provided a good deal of flexibility and made it possible for the states to expand, innovate, improve and develop new approaches to education and training for employment.
1972 1976	Amendments to the Vocational Education Act of 1963	Established the a National data system, sex equity staffing at the state level, programs for limited-English speaking adults, and many additional requirements were made of the States that led to increased administrative burden and unnecessary read tape. First emphasis on secondary post-secondary partnerships. The 1976 amendments to the Vocational Education Act of 1963 require states to act affirmatively to eliminate sex bias, stereotyping, and discrimination in vocational education.
1980	The Job Training Partnership Act	<p>It is the purpose of the Job Training Partnership Act (JTPA or the Act) to establish programs to prepare youth and adults facing serious barriers to employment for participation in the labor force by providing job training and other services that will result in increased employment and earnings, increased educational and occupational Skills, and decreased welfare dependency, thereby improving the quality of the work force and enhancing the productivity and competitiveness of the Nation (section 2). Included provisions for secondary students and programs to be offered in public schools for the first time. Separate funding streams and authorizing legislation for JTPA, Wagner Peyser, vocational education, adult education, and vocational rehabilitation.</p> <p>JTPA: separate funding streams for disadvantaged adults, dislocated workers, disadvantaged youth, and summer youth.</p>

1983	<i>A Nation at Risk</i> (National Commission on Excellence in Education, 1983)	Indirectly negative towards vocational education but two of the commission members admitted in 1985 that it was not their intention to ignore vocational education – they had run out of money and congress would not give them any more.
1984	National Commission on Secondary Vocational Education (1984)	The mid-1980s were a critical time for launching various secondary-to-postsecondary articulation initiatives, with the endorsement of tech prep and applied academics.
1984 1990 1998	Carl D. Perkins Vocational Education Legislation	Emphasizing vocational articulation and allowing expenditure of federal funds for tech prep. Called for fewer dollars for state activities and administration while increasing the populations to be served and data to be reported. Legislation in the decade of the 1990s emphasized the importance of secondary-to-postsecondary transition even more. In 1990, the Carl D. Perkins Vocational and Applied Technology Education Act contained Title III-E, The Tech Prep Education Act, which targeted federal funding toward the implementation of 2+2 Tech Prep education programs. Combined secondary and postsecondary programs designed to lead to two-year associate degrees, certificates, or adult apprenticeships were the primary goal of tech prep implementation.
1985	<i>The Neglected Majority</i>	Dale Parnell's book <i>The Neglected Majority</i> (1985), was published. In his book, Parnell argued for a much broader conceptualization of educational reform to meet the needs of students left out of the educational reform debate. (Refuted the slights of <i>A Nation at Risk</i> .)
1994	the School-to-Work Opportunities Act (STWOA) of 1994	Called for secondary-to-postsecondary articulation as a part of reformed educational systems focused on combining school and work in more creative and challenging ways for "all students." School-to-Work Opportunities systems were to be connected in real and significant ways to the federal Goals 2000 educational reform agenda. Tied all learning to three areas: school-based, connecting, and work-based.
1998	Workforce Investment Act of 1998	Bill is organized into five titles: (1) job training; (2) Adult Education; (3) amendments to Wagner-Peyser and related Acts; (4) amendments to the Vocational Rehabilitation Act; and (5) general provision. Does not include vocational education, which is addressed in separate legislation. Maintains separate funding streams for adults, dislocated workers, and youth. Introduced the One-Stop Centers.

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Appendix F

State and National Trends Impacting CTE Curriculum Development

Successful Career and Technical Education (CTE) programs, at a minimum, incorporate solid partnerships between education and business/industry, State goals and learning standards, national and State skill standards, and testing and graduation requirements. Each of these elements has a history and purpose in CTE, and these are discussed below in relation to Illinois.

Illinois Learning Standards

As a result of the federal Education Reform legislation passed in 1985, the Illinois State Board of Education approved the Illinois State Goals for Learning, which explicated what students are expected to know and do as a result of their schooling in seven learning areas. The State Board also instituted the Illinois Goal Assessment Program (IGAP) to provide a common yardstick for monitoring school and district progress in achieving these goals. (1)

Education Reform legislation also contained what is known as the “Primary Purpose of Schooling”. In the Joint Committee On Administrative Rules: Administrative Code, Title 23: Education And Cultural Resources; Subtitle A: Education; Chapter I: State Board Of Education; Subchapter A: Public School Recognition; Part 1 Public Schools Evaluation, Recognition And Supervision; Section 1.10 Public School Accountability Framework, it states:

“Each school district shall ensure that each school makes available to all students instruction in the six fundamental learning areas (i.e., the language arts, mathematics, the biological, physical, and social sciences, the fine arts, and physical development and health). Each school district shall also ensure that a continuous school improvement process that includes all State Goals for Learning is carried out by each school in the district. And further, each school district is required to establish local learning objectives that are consistent with the primary purpose of schooling, assessment systems for measuring students' progress in the fundamental learning areas, reporting systems for informing the community and the State of assessment results, and plans for improvement, all of which are subject to approval by the State Board of Education (Sections 2-3.63 and 27-1 of the School Code [105 ILCS 5/2-3.63 and 27-1]). (2)

When the Education Reform legislation was passed in 1985, the vocational education (i.e., career and technical education) community and supporters tried to amend the legislation to include vocational and technical education as one of the fundamental areas of learning. Opponents consistently attached fiscal notes, which often over-estimated the cost of implementing a new bill or amendment to existing legislation, as a means to defeat the proposed legislation and/or amendments. Once the rules to implement the legislation were adopted, the vocational education community continued to get bills introduced to make vocational and technical education a “primary purpose of schooling”. But, even in those years when bi-partisan support was found, attached fiscal notes either caused the legislation to be locked in committee or to be defeated on the floor.

In 1995, the state legislature directed the Illinois State Board of Education to update the learning goals and to set higher standards of learning for all students. In 1997 the Illinois Learning Standards were delivered to the legislature and to the education community. The new standards led to new state assessments now called the Illinois State Achievement Test (ISAT). For the first time, career and technical education was recognized as a learning area, albeit in Appendix D, in the Workplace Skills & Career Development Competencies: Linkage to the Illinois Learning Standards. In this document, workplace skills and career development outcomes are identified and cross walked with the academic learning standards. (3)

SCANS

In 1990, the Secretary of Labor (Lynn Martin, Rockford, IL) appointed a commission to determine the skills young people need to succeed in the world of work. The commission's fundamental purpose was to encourage a high-performance economy characterized by high-skill, high-wage employment. Although the commission completed its work in 1992, its findings and recommendations continue to be a valuable source of information for individuals and organizations involved in education and workforce development. (4)

The commission, or SCANS (i.e., the Secretary's Commission on Achieving Necessary Skills), was asked to examine the demands of the workplace and whether today's young people were capable of meeting those demands. Specifically, the Commission was directed to advise the Secretary on the level of skills required to enter employment. In carrying out this charge, the Commission was asked to:

- Define the skills needed for employment;
- Propose acceptable levels of proficiency;
- Suggest effective ways to assess proficiency; and
- Develop a dissemination strategy for the nation's schools, businesses, and homes. (5)

The final report was titled Learning a Living, and as an introduction it states:

A high-performance workplace requires workers who have a solid foundation in the basic literacy and computational skills, the thinking skills, and in the personal qualities that make workers dedicated and trustworthy. High-performance workplaces also require competencies: the ability to manage resources, to work amicably and productively with others, to acquire and use information, to master complex systems, and to work with a variety of technologies. This, the SCANS final report, provides a blueprint for groups at the national, state, and local levels. Our nation's ability to lead in a global economy will depend on the outcome of those conversations. (6)

This was one of the first projects that called for collaboration between education and labor, and it was the forerunner to the Department of Education's involvement with the Department of Labor in the National Skill Standards Board, the Workforce Investment Act, and the School to Work Opportunities Act.

National Skill Standards

The National Skill Standards Act of 1994 created the National Skill Standards Board (NSSB) which was to close the skills gap in the United States workforce. The Board was composed of 24 members from business, labor, and education and training institutions, plus the Secretaries of Commerce, Education, and Labor as ex officio members. The Board was charged with building the framework in which a skill standards system would work. Components of the framework were defined as skill standards, assessments, and certifications, and these were to be portable across industry sectors. (7)

To make the work of identifying skill standards balanced, the NSSB categorized the United States Workforce into 15 industry sectors. The sectors identified were:

- Agriculture, Forestry, and Fishing
- Business and Administrative Services
- Construction
- Education and Training
- Finance and Insurance
- Health and Human Services
- Manufacturing, Installation and Repair
- Mining
- Public Administration, Legal, and Protective Services
- Restaurants, Lodging, Hospitality and Tourism, and Amusement and Recreation
- Retail Trade, Wholesale Trade, Real Estate and Personal Services
- Scientific and Technical Services
- Telecommunications, Computers, Arts and Entertainment, and Information
- Transportation
- Utilities and Environmental and Waste Management (7)

The goal of the NSSB was to use a system of voluntary partnerships to develop three kinds of standards for each sector: core standards, concentration standards, and specialty standards. NSSB defined core standards as the skills and knowledge necessary for any job within an industry sector(s), such as math, reading, and understanding safety issues. Concentration standards were the skills and knowledge specific to a certain area or group of jobs within an industry sector. Specialty standards were the skills and knowledge that were developed by independent organizations, such as operating a specific piece of equipment or applying a specific safety regulation. (7) There were 22 original pilot projects, with each project operating as a separate contract. The format and extent of development for each project were determined by the voluntary partnership formed with NSSB approval. In some cases, projects became public domain and available to any interested party. In other instances, the partnership held control of the project and access was limited to partners or those who were able to purchase. Funding for NSSB and its projects ceased in 2002.

In 2003, NSSB became The National Skill Standards Board Institute (NSSBI), a membership foundation for communities of interest related to the development and use of industry skills requirements, skills assessments for learning or selection, and certifications. Communities of interest included: certifiers, industry and professional associations, education and training providers, policy makers, and certification holders. The NSSBI was deemed responsible for

convening industry leaders and for oversight of the development and maintenance of macro-level, industry-wide skill standards. The NSSB Education and Research Institute (NSSBE&RI), operating as a 501(c) (3), was deemed responsible for information storage and dissemination around issues of quality assurance and system integrity. (8) But, in 2005, the institute is largely dormant and not actively involved in these activities. (9)

Illinois Skill Standards

The Occupational Skill Standards Act (PA 87-1210) established a nine-member Illinois Occupational Skill Standards and Credentialing Council (IOSCC). These members represented business, industry, and labor and were appointed by the Governor or the State Superintendent of Education. The council worked with the Illinois State Board of Education, Illinois Community College Board, Illinois Board of Higher Education, Illinois Department of Employment Security, and the Illinois Department of Commerce and Community Affairs to create a common vision for workforce development in Illinois.

Industry subcouncils were formed to review, approve, and promote occupational skill standards and credentialing systems. Industry subcouncils formed included the following: Agriculture and Natural Resources; Applied Science and Engineering; Business and Administrative Information Services; Communications; Construction; Education and Training Services; Energy and Utilities; Financial Services; Health and Social Services; Hospitality; Legal and Protective Services; Manufacturing; Marketing and Retail Trade; and Transportation, Distribution, and Logistics.

In the years from 1997 until 2003, forty-seven different occupational skill standards were developed and approved. Each completed project defines what an individual needs to know and be able to do to be successfully employed in an occupation. Components found in each of the final products include the performance areas, performance skills, skill standards, performance elements, and the performance assessment criteria. Funding for this activity was eliminated in 2003, and no new standards have been developed since the project was shut down. (10)

Graduation Requirements

Beginning with the release of the report “A Nation at Risk” in 1983, there has been an ongoing demand for higher graduation requirements and stronger learning standards. The Carl D. Perkins Vocational Education Legislation addressed this in the original bill and through the two reauthorizations (1984, 1990, and 1998). The act called for applied academics; increased assessment; articulation agreements between secondary and post-secondary schools; authentic assessment; and work-based learning, including tech prep programs which started in the eleventh grade and moved a student through a minimum of a four year secondary/post-secondary program.

In Illinois in response to the “A National at Risk Report”, graduation requirements were changed to take effect for the 1984-85 school year. Although several changes in the Illinois Learning Standards and the State testing program have occurred in the years since the graduation requirements were adopted, no changes occurred in the graduation requirements until the spring of 2005. During this time, the State Legislature passed SB 575, which sets new graduation

requirements to be phased in starting with the graduating class of 2006 and becoming fully implemented for the graduating class of 2009. An overview of these changes and how they compare with entrance requirements at state universities can be found in an article prepared by the Illinois Business Roundtable. This article can be found at: <http://www.illinoisbusinessroundtable.com/documents/GraduationRequirements.pdf>. Changes in graduation requirements in Illinois and other states address “seat time,” as opposed to addressing whether a student has met the learning or occupational skill standards demanded for future success.

State Testing

The Prairie State Achievement Examination (PSAE) measures achievement of 11th grade students relative to the Illinois Learning Standards for [reading](#), [mathematics](#), and [science](#). The PSAE includes three components: (1) an ISBE-developed science assessment; (2) the [ACT](#) Assessment, which includes reading, English, mathematics, and science tests; and (3) two [WorkKeys](#) assessments (i.e., [Reading for Information](#) and [Applied Mathematics](#)).

Other Initiatives

Since 1984, many initiatives have been adopted by local schools, and some of these initiatives have been partially funded by the Illinois State Board of Education. One initiative supported by ISBE that recognizes career and technical education as an integral part of comprehensive education is the Southern Region Education Board’s (SREB) High Schools That Work.

This initiative is successful because it recognizes the importance of both academic and career and technical education for all students. “Doing What Works: Moving Together on High Standards for All Students” is a report that discusses how High Schools That Work are organized and how student success can be achieved through a framework of practices that include the following:

1. Setting high expectations for all
2. Increase students’ access to academic studies that teach college preparatory content
3. Increase students’ access to academic studies that teach college preparatory content at high minority schools
4. Pay attention to transitions: middle grades to high school and high school to post-secondary studies and work
5. Increase access to challenging career/technical studies with emphasis on using high-level math, science, language arts, and problem-solving skills
6. Provide access to work-based and school-based learning planned cooperatively by educators and employers
7. Engage students actively in learning: Literacy
8. Engage students actively in learning: Numeracy
9. Get all teachers to work together to integrate academic and career/technical studies
10. Involve students and parents in a guidance and achievement system designed to ensure that students complete an accelerated academic program of study and a career/technical major

11. Provide a structured system of extra help to assist students in meeting higher standards
12. Use student assessment and program evaluation to improve curriculum, instruction, school climate, organization and management to advance student learning (11)

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