



Preparing Tomorrow's Skilled Workforce:

NOCTI Outcomes Demonstrate Consistent Improvements in Secondary Career and Technical Education

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The Issue

With the increasing need and the projected shortages of skilled workers in the United States, the issue of measurement in career-technical education (CTE) is one of long term concern to the field, and to the country.

Since the beginning of secondary and postsecondary vocational education programs, there has been an ongoing debate as to what the mission of such programs should actually be, and it is clear that there is still no universally accepted answer to that debate.

"Our ultimate goal is that all students graduate from high school—and graduate ready for college and work."

David P. Driscoll,
Massachusetts' Commissioner
of Education, 2005

However, most would agree that the goals and intended outcomes of career and technical education could be summarized in the answers to two basic questions:

- 1) Are students gaining knowledge and skills in CTE programs?
- 2) Are those skills adequately preparing them for the workplace?

In an effort to help answer those questions, NOCTI conducted a study of student outcome data as represented by their battery of Job Ready assessments.

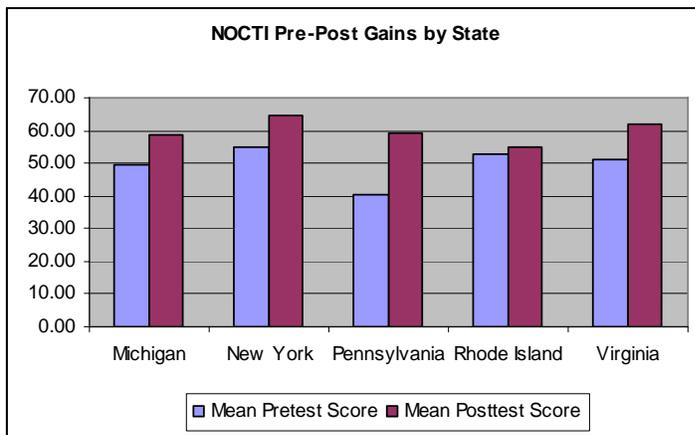
The Study

In looking at three years of assessment results (Fall of 2003 through Spring of 2006), NOCTI used data from five states to examine student progress in CTE programs.

Each of the sites in the study used NOCTI assessments to measure student progress via a written pre-test administered at the beginning of the program, and a written post-test administered at the end of the program.

Three of the states also administered NOCTI's end-of-program performance assessments.

Study Data Summary	
Number of Years	3
Number of States	5
Number of Sites	11
Number of Tests	63
Career Clusters Represented	12
Total Written Pretests	6853
Total Written Posttests	5787
	3388



The chart to the left indicates that students in all 5 states showed skill improvement but students in 4 of the 5 states showed statistically significant skill improvements upon CTE program completion ($t=43.52$; $p<.001$). The average gain from pre- test to post-test was 11.56%.

In addition, performance post-tests showed average scores of 86.28% ($sd=15.19$), indicating that a high degree of technical competence at the job ready level had been achieved.

The Message

In spite of the many challenges inherent in measuring CTE outcomes and progress, the results of this analysis help to answer the two paramount questions surrounding CTE programs.

1) Are students gaining knowledge and skills in CTE programs?

The results of NOCTI's analysis of pre- and post-tests over 3 years, in a wide variety of CTE programs (63), indicate that the schools in this study are successfully providing students with the knowledge they will need to begin their careers.

Based on national occupational standards, as well as integrated academic standards in language arts, math, and science, NOCTI's tests measure the knowledge and skills necessary for successful performance in today's workplace. As end-of-program tests, they measure primarily long-term retention of knowledge that students will carry with them into employment.

Although the students in this study are not "experienced" workers, their scores, and more importantly, improvement through the program, indicate that they gained significant knowledge relevant to their chosen field upon completion.

2) Are those skills adequately preparing them for the workplace?

NOCTI tests are designed to measure technical competence in a particular occupation; the knowledge and skills assessed are directly applicable to that occupation. The increase in knowledge shown by students in this study demonstrates that CTE programs are providing the skills and core occupational skills necessary for successful performance and continued learning on the job.

In addition, the students' strong showing on NOCTI's end-of-program performance assessment indicates that they are able to translate what they have learned and successfully apply it to the type of work they will be performing once they begin their careers.

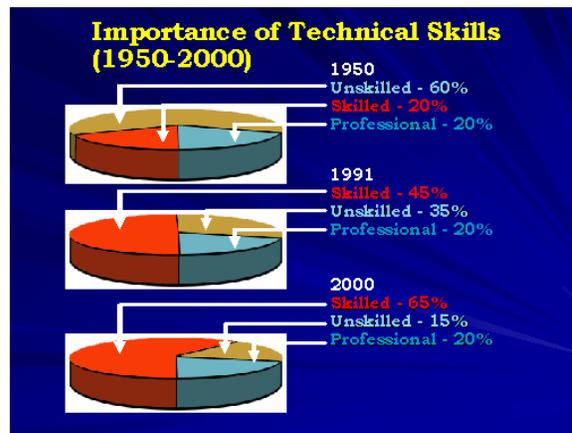
This brief overview indicates that CTE programs in this study are successfully helping students to prepare for skilled positions and those students are gaining valuable skills.

The Big Picture

In the last half-century, the United States has seen a dramatic increase in the need for skilled workers, while workplace opportunities for unskilled workers have plummeted.

The growing importance of technical skills in today's workplace is coupled with an increasing attention to the disturbing high school dropout rate in this country. As Margaret Spellings pointed out, "today, only 68 out of 100 entering ninth-graders will graduate from high school on time." (Address to the National Governor's Association, February 27, 2005).

Our economy can not afford to have a workforce that consists primarily of unskilled labor. We *must* prepare our future workforce for the realities of today's, and tomorrow's, economy.



"CTE provides a connection between the supply and demand of the workforce, workforce needs and preparation, and students who are better prepared for the workplace."

Patty Cantau, Director, Office of Career and Technical Preparation, Michigan, 2006.

Numerous studies have demonstrated the positive effect of career-technical education (e.g., Gray 2002¹, Rosenbaum, 2001²). State Directors across the country have worked with employers and secondary and postsecondary educators to develop national, validated competencies that schools are now using to benchmark and update their curriculum, enhance career guidance and counseling strategies, and more effectively integrate academic, technical, and employability skills to promote better transfer between education and the workforce. The results of these efforts can be seen in the data showing CTE's impact on dropout rates, academic success, and employment outcomes.

In a phone survey conducted by National Association of State Directors of Career and Technical Education (NASDCTE) and the Association of Career and Technical Educators (ACTE), State Directors and CTE educators of the five states in the study indicated that CTE's major benefits included adding relevance to the academic school experience, motivating students to remain in school, and providing technical skills that prepare the student for success in either the work environment or further education. Dr Lee Burket, Director of the Bureau of Career and Technical Education in Pennsylvania, said "At the local, state, and national level, CTE assists in retaining an educated and technically competent workforce. It supports Pennsylvania's overall goal of ensuring Pennsylvania businesses have access to a skilled workforce."

These benefits are especially important with the graying of the workforce. Elizabeth Russell, State Director of CTE in Virginia, indicated, "Virginia is facing a dwindling workforce due to the retirement of baby boomers. They see major shortages in pretty much every field.... High school is definitely the time and place to start making students aware of different career opportunities and also a good place to begin teaching the workplace readiness skills."

¹ Gray, Ken (2002). The Role of Career and Technical Education in the American High School: A Student Centered Analysis. Paper commissioned for "Preparing America's Future: The High School Symposium" (Washington, D.C., April 4, 2002).

² Rosenbaum, J.E. (2001). *Beyond College for All*. New York: Russell Sage Foundation.

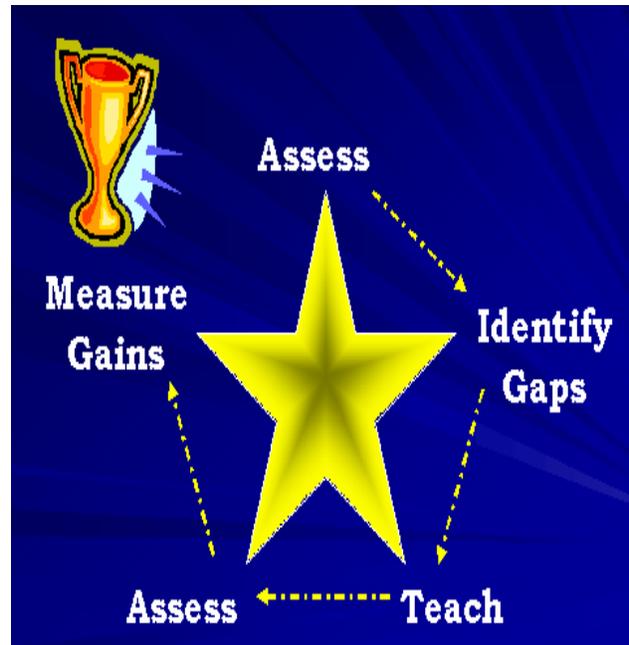
In addition to data indicating program effectiveness, CTE educators also highlighted their numerous success stories with students in CTE. Patty Palo of Erie County Technical School in New York highlighted students who graduated, started businesses such as construction companies, and who have since sent their children to CTE to learn the family business. Pat Broughton of Charlottesville Albemarle Tech in Virginia and Rod Tarr, Director of Venango Technology Center in Pennsylvania, spoke of the many local businesses (e.g., restaurants, salons, auto body repair) that are owned by former students. Mary DeProspero-Adams of Western Area Career and Technology Center in Pennsylvania noted the high-paying jobs students were able to get, such as one former welding student, now 23, who was working for an international company making over \$25 an hour.

“The end of program assessments level the playing field with students from around the state and country. Employers know that the student’s achievements on the assessment are a valid indicator that the student is prepared for the job they are being hired to fill.”

Carolyn Bova, Orleans/Niagara BOCES, New York, 2006

In addition to the benefits of CTE, there are also a wealth of studies documenting the benefits of testing and assessment in educational programs³, although standardized assessment of progress and outcomes has historically been a missing component of career-technical education. Recently, this has been changing. As the need for skilled workers and the importance of career-technical education has grown, attention has turned to assessment and measurement of CTE and other education programs. Today, valid, standardized assessments provide invaluable information to states, programs, and individuals which they can use to improve programs, increase student motivation, target weaknesses, highlight strengths, measure progress, and make data-driven decisions about future goals.

In the phone interviews conducted by NASDCTEc and ACTE, state directors and CTE educators supported the use of valid, standardized assessments in CTE. As Mike Haffner of Branch Area Technical Center in Michigan indicated, “assessments help to maintain and improve the quality of CTE, which in turn leads to greater credibility for CTE.” Rod Tarr spoke of the value of assessments as accountability tools. “We use NOCTI test results as our main method of accountability. We are an ISO 9001:2000 registered organization and NOCTI results are vital ingredients in the measurement of the level of quality that exists in all of our programs.” Mary DeProspero-Adams highlighted the benefits to students as well. “Students can use the assessments as a measuring stick to see how much they improved over a year. They get a sense of accomplishment.”



State Directors also supported the value of assessments. Vanessa Cooley of Rhode Island indicated “We use the data to do comparative analyses to ensure students are achieving. The analysis is either student to student or instruction to industry. The is done on the local level but

³ Phelps, Richard (2005) The Rich, Robust Research Literature on Testing’s Achievement Benefits, in *Defending Standardized Testing* (pp.55-90), Lawrence Erlbaum Associates, Inc.

is also a part of the state's curriculum work....Rhode Island is trying to ensure the curriculum is correlated to industry's requirements." Elizabeth Russell of Virginia spoke of using end of program assessments in conjunction with industry certifications. "Recently, schools have been using NOCTI (assessments) as preparation for the industry certification tests."

Respondents and participants from these 5 states indicate a clear focus on both educational and economic goals for students and society. Their ability to use nationally validated, industry established competency data to show legitimate gains is visionary. These individual examples of success, professional opinion in the field, and quantitative data all indicate that working towards their common goal, a combination of quality career-technical education and meaningful, valid assessments will result in tomorrow's skilled workforce.

John Foster, long time advocate of CTE programs, says that once again CTE programs, schools and teachers have demonstrated that participation in CTE provides solid educational and economic gains for those students who choose to take advantage of them.

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Information about NOCTI may be obtained at www.nocti.org or 1-800-334-6283



Information about ACTE may be obtained at www.acteonline.org or 800-826-9972



Information about NASDCTEc may be obtained at www.careertech.org or 202-737-0303