

**IDENTIFICATION OF SELECTED FACTORS THAT IMPACT THE PREPARATION
OF CTE TEACHERS**

Howard R. D. Gordon
University of Las Vegas, Nevada

IDENTIFICATION OF SELECTED FACTORS THAT IMPACT THE PREPARATION OF CTE TEACHERS

Abstract

Career and technical education (CTE) has remained a dynamic entity in the world of education since its inception. The changes in the 1990s have made significant advancements in the image and validity of career and technical education programs. These programs have become an important factor of economy and social growth worldwide. The success of students begins with how they are educated and the quality and training of their teachers. Improving teacher quality will be important if CTE is expected to alter its mission. The availability, experience, priorities, and selected practices of teachers can be expected to affect quality of instruction. This conceptual paper reported the following factors as impacting the preparation of CTE teachers: industry experience and academic background, teacher shortages, alternative routes to licensure, professional development, recruitment. Substantial investments in recruitment and in-service training approaches may be required if federal legislation continues to make supporting academic achievement a priority for CTE.

Introduction

Teacher quality has increasingly become a focus of policymakers' interest in regular K-12 education, however less attention has been placed on how well career and technical education teachers are being prepared for their jobs (U. S. Department of Education, 2004). To date, these policy discussions have been mostly limited to improving the preparation of academic teachers. However, career and technical education, which many assume has very little to do with academics, has received scant attention.

Many high school students are still very interested in CTE programs and courses, and there are strong CTE programs across the country that not only prepare people for careers and lifelong learning, but also advance their understanding of academics. By connecting both academic and technical knowledge to real-world applications, these programs often succeed where the conventional academic curriculum often fails in engaging students and giving meaning to learning (Bottoms, 2008). Consequently, these programs need as much support as they can get, especially in the form of qualified teachers who can effectively bring rich and challenging CTE curricula to life. The purpose of this conceptual paper is to discuss selected factors that impact the preparation of CTE teachers.

Conceptual Framework

Role of Federal Legislation and Educational Reform on CTE

Career and technical education programs in U.S. secondary and postsecondary schools exist because of federal legislation. Since the inception of federal support for public CTE as mandated by the Smith-Hughes Act of 1917, the federal government has been a major influence in determining the purview of CTE training.

A primary force that led the passage of the Smith-Hughes Act was economic, primarily seen in the growing need to prepare young people for jobs created as a result of the industrial revolution. A secondary purpose of the Act was to provide youth with an alternative to "classics-bound," academic high school curriculum (Sarkees-Wircenski & Scott, 1995).

The Smith-Hughes Act established career and technical education as a separate and distinct "system" of education that included separate state boards of CTE, funding, areas and methods of study, teacher preparation programs and certification, and professional and student organizations. Hayward and Benson (1993), reported that the legislation "contributed to the isolation of CTE from other parts of the comprehensive high school curriculum and established a division between practical and theoretical instruction in U.S. public schools" (p.3). Table 1 provides an overview of previous CTE legislation.

Table 1*Overview of Previous Federal CTE Legislation.*

Periods of CTE Legislation	Policy Objectives and Tools
1917-1963	Provide trained workers for growing semi-skilled occupations and retain more students in secondary education through: <ul style="list-style-type: none"> · Expansion of separate CTE schools and programs · Funds for basic maintenance of programs · Focusing on agriculture, industry, and home economics for high school students
1963-1968	Improve and expand career and technical education through: <ul style="list-style-type: none"> · Separate funds for innovative programs, research, and curriculum development · Support for construction of regional area vocational schools · Support for adult training and retraining (postsecondary CTE) · Encouragement to states to promote CTE equity and better service to disadvantaged students
1968-1990	Improve career and technical education and facilitate access through: <ul style="list-style-type: none"> · Periodic encouragement to states to distribute some funds by a community's economic need and levels of student disadvantage · Establishment and expansion of set-aside funds to serve special population groups · Prohibiting the use of most federal funds for maintenance of programs · Continuation of set-aside funds for program improvement
1990-1998	Expansion of equal access and emphasis on academic quality through <ul style="list-style-type: none"> · Introducing interstate and intradistrict funding rules: distribution to agencies and schools weighted by special populations · Promoting "integration" of academic and CT education and "all aspects of the industry" · Set-aside funds for new programs linking secondary and postsecondary CTE: Tech-Prep · Requirement that states develop performance standards

Source: Gordon, H. R.D. (2008). The history and growth of career and technical education in America

Early reform efforts, such as "A Nation at Risk," called for a recommitment to academic basics, with enhanced curricula at all levels consisting of more English, mathematics, science, and technology courses. Five specific areas of reform were targeted: (a) strengthening high school graduation requirements, (b) establishing minimum academic achievement standards, (c)

increasing class time on academic basics, (d) improvement of teacher preparation and education profession, and (e) accountability. Individual states responded by adopting stricter high school graduation requirements, introducing statewide testing, and increasing teacher standards (National Commission on Excellence in Education, 1983).

Factors Impacting Preparation of CTE Teachers

Fewer University Programs to Prepare CTE Teachers

Dykman and Mandel (2000) reported that “there are fewer university programs to prepare CTE teachers today than there were in the 1980s, when “A nation at Risk” served as a call to arms for the education policy community”(p.1). Dykman and Mandel (2000) further noted that today’s university programs are less likely to prepare teachers for advanced technical instruction or teaching key aspects of challenging academics. Bruening, Scanlon, Hodes, Dhital, Shao, and Liu, (2001) reported that the number of colleges and universities offering CTE teacher training programs declined by 10 percent during the 1990s.

Industry Experience and Academic Background

Unlike the specifications for academic teachers in the No Child Left Behind Act, the Perkins Act does not require grantees to define a highly qualified CTE teacher or to set goals for ensuring that students in CTE programs have access to one. Since CTE is rooted in training for jobs and family life directly after high school, it historically placed great value on teachers’ occupational skills. Current federal CTE policy, however, emphasizes improving the academic achievement of CTE students (U.S. Department of Education, 2004). Among new teachers, those who are in CTE fields are more likely to come from industry. According to Levesque (2003), during 1991-2000, more than one-third of new CTE teachers that were working (‘had industry experience’) as their main activity during the year before being hired, compared to 9.7 percent of new teachers in other fields.

CTE teachers remain less likely than other high school teachers to hold a baccalaureate degree. CTE teachers without this educational credential are concentrated in CTE high schools and are CTE centers, where emphasis on CTE instruction is more intensive (Levesque, 2003). Nationally, the proportion of states requiring that CTE teachers have at least a baccalaureate degree declined during the 1980s and 1990s (U.S. Department of Education, 2004). The lowering of state requirements is probably attributed to shortages of CTE teachers.

Teacher Shortages

It is estimated that the nation will need one million new teachers by 2010. Of the 10 licensure areas that will experience the greatest replacement needs, high school teacher is ranked fifth (Dohm, 2000). Grades 9-12 enrollments in public schools are projected to increase by 4.2 percent by 2010, and the number of secondary teachers needed by the same period is expected to increase by 78, 00 or 6.8 percent (Gerald & Hussar, 2000). However, at the same time, the baby boom generation, which constitutes a significant share of the teaching force, is aging and retiring. According to a study by Gaurino, Brewer, and Hove (2000), CTE teachers are, on average, significantly older than non- CTE teachers. This finding suggests that the need to fill CTE positions will be very challenging.

Alternative Routes to Licensure

Not all CTE teachers enter the classroom through traditional, university-based programs. Sometimes they have degrees in other subject areas and /or have been working outside of education. Due to the result of teacher shortages, there has been an increase in the support for alternative licensure procedures. This pathway to teaching is also called “provisional” or “emergency” licensing. Historically it has been the traditional route for teachers of trade and industrial education. Critics of this route say it sometimes contributes to CTE’s image problem (Gray & Walter, 2001; Lynch, 1998). The perception of this pathway is that it could shortchange students because teachers with alternative licenses don’t necessarily need a college degree to teach.

Professional Development

National data suggest that the majority of CTE teachers participate in professional development and in 2001 (U.S. Department of Education, 2004) this was evident by the distribution of selected topics generated by Perkins III (Table 2). Many states also have programs that encourage CTE teachers to participate in externships with industry. Professional development remains an important strategy to improve CTE.

Table 2

Percentage of Teachers Reporting on and Average Hours Spent in Professional Development on Selected Topics: 2001.

Selected Topics	Academic Teachers		CTE Teachers	
	Percentage Of Teachers	Average Hours for Participants	Percentage of Teachers	Average Hours for Participants
Academic curriculum standards or student performance standards	87.0	9.6	83.3**	8.7
CTE curriculum standards or student performance standards	40.6	6.3	77.0**	10.5*
Specific content in teacher's subject area	70.5	11.6	75.6**	12.9
Incorporating academic content standards or performance standards into career related classes	33.6	7.8	70.8**	8.5
Incorporating career related activities into academic curriculum	37.7	6.2	52.2**	8.0*
Using technology or equipment specific to teacher's classes	79.2	8.7	81.4	11.0*
Working with students with special needs	38.4	7.8	40.9	7.8
Using student assessments	65.4	7.9	57.1**	8.1
Designing curriculum or instruction where students apply concepts to real world problems	46.7	8.4	55.9**	9.3
Incorporating workplace competencies into teacher's subject area	31.5	8.0	51.9**	8.6

Recruitment

Finding new prospects to replace CTE teachers and to fill new slots is a challenging task. It is anticipated that many schools across the country will experience shortages of CTE teachers due to the teacher workforce ages. Several factors have contributed to the teacher recruitment problem including changes in class size, retirement of a significant percentages of teachers; movement of teachers from school to school (Ingersoll, 2001).

Implications and Concluding Remarks

A number of implications exist for structuring career and technical education teacher preparation programs. Lynch's study (as cited in Rojewski, 2002, p.30), suggests that a teacher preparation curriculum in CTE should address the following components:

1. Assessment
2. Curriculum framework
3. Standards of knowledge and practice
4. Principles of CTE
5. Philosophical foundations

A study by Frantz (as cited in Rojewski, 2002, p.31), indicated that the six highest rated implications for teacher preparation are:

1. The need for a broad-based philosophical understanding of the purpose of education and the role of CTE in restructuring workforce preparation.
2. Programs that are structured to optimize the subject matter relationships and the collaboration needed between CTE and academic education.
3. A common knowledge base that provides philosophical, sociological, economic, and psychological foundations.
4. Incorporation of technological and organizational practices of the workplace, as well as current pedagogical concepts and practices.
5. Preparing CTE educators for new leadership roles requiring skills in working with community-based, school, and political groups.
6. An emphasis on contextual learning strategies as a means for linking education and the workplace.

Teacher preparation programs leading to licensure should be designed to equip individuals with the following additional competencies in order to ensure that CTE teachers develop the skills and knowledge to:

- Provide students with information and experiences that will assist with career development planning and decision making
- Develop programs based upon models of effective instructional designs and techniques
- Integrate academic and technical skills in an applied occupational context
- Evaluate, select, and use instructional resources and technology
- Provide students with multiple clinical experiences including supervised work-based learning (Gray and Walter, 2001, p.38).

Licensing requirements for CTE teachers should be as demanding as requirements for other teachers.

College faculty need to spend more time in high schools with both novice and highly accomplished teachers and in industries in which they specialize. This may provide the kind and quality of teaching America's students need.

School leaders need to provide a culture of continuous professional development that includes peer review, self-examination, and inquiry to support the induction of novice teachers and foster the professional growth of experienced teachers. Perhaps more than ever before, it is essential to recruit highly effective teacher because,

while many U.S. citizens are too poorly educated to gain employment in the new economy, high-tech firms must import workers with science and technology

training from other parts of the world. And while the U.S. has sent many of its low skilled jobs abroad, it is falling behind other nations that once supplied cheap, unskilled labor, who are now developing highly educated workforce that will soon direct the work of others. (Darling-Hammond, 2006, p.15)

Workforce readiness, regardless of locality in the world has one significant common factor. That factor is qualified and motivated teachers who are the foundation of student's education. If the teacher is not prepared to instruct with the integration of new technologies, international issues, general core academia and skills that employers are seeking, then students will not be adequately prepared for the workforce. Preserving and aiding the strong CTE programs and improving others, however, will require a significant commitment to curriculum development, professional development, and the preparation of new teachers according to high-quality CTE standards.

References

- Bottoms, G. (2008). A vision for high schools: Joining academic and technical studies to promote more powerful learning. *Techniques*, 83(8), 16-21.
- Bruening, T. T., Scanlon, D. C., Hodes, C. Dhital, P., Shao, X., & Liu, S. (2001). *The status of career and technical teacher preparation programs*. Minneapolis, MN: National Research Center for Career and Technical Education, University of Minnesota.
- Darling-Hammond, L. (2006). Securing the right to learn: Policy and practice for powerful teaching and learning. *Educational Researcher*, 35(7), 13-24.
- Dohm, A. (2000) Gauging the labor force effects of retiring baby-boomers. *Monthly Labor Review*, 123(7), 17-25.
- Dykman, A., & Mandel D. R. (2000). *Educating career & technical education teachers: Building a new model*. Symposium Proceedings (Washington, DC).
- Gaurio, C., Brewer, D., & Hove, A. (2000). *Who's teaching, and who will teach vocational education?* Santa Monica, CA and Berkley, CA: RAND and National Center for Research in Vocational Education.
- Gerald, D., & Hussar, W. (2000). Projections of education statistics to 2010 (NCES 2000- 071). U. S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.
- Gordon, H. R. D. (2008). *The history and growth of career and technical education in America* (3rd ed.). Long Grove, IL: Waveland press, Inc.
- Gray, K. C., & Walter, R. A. (2001). *Reforming career and technical education teacher licensure and preparation: A public policy synthesis*. National Research Center for Career Technical Education, The Ohio State University.
- Hayward, G. C., & Benson, C. S. (1993). *Vocational- technical education: Major reforms and debates, 1917- present*. Washington, DC: U.S. Department of Education, Office of Vocational and Adult Education. (ERIC Document Reproduction No. ED 369 959).
- Ingersoll, R. M. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal*, 38(3), 499-535.
- Levesque, K. (2003). *Teacher quality in vocational education*. A report presented by MPR Associates for the National Assessment of Vocational Education. Washington, DC: U.S. Department of education, Office of Under Secretary.
- Lynch, R. L. (1998). Occupational experiences as the basis for alternative teachers certificate in vocational education. In A. Gamaron & H. Himmelfarb (Eds.), *The quality of vocational education: Background papers from the 1994 national assessment of vocational education*. Washington, DC: U.S. Department of Education, Office of educational Research and Improvement.
- National Commission on Excellence in Education. (1983). *A nation at risk: The imperative for educational reform*. Washington, DC: Author.
- Rojewski, J. W. (2002). *Preparing the workforce of tomorrow: A conceptual framework for career and technical education*. National Research Center for Career and Technical Education, The Ohio State University.
- Sarkees- Wircenski, M., & Scott, J. L. (1995). *Vocational special needs* (3rd ed.). Homewood, IL: American Technical.
- U.S. Department of Education (2004). *National assessment of vocational education: Final report to Congress*. Washington, DC: Office of the Under Secretary, Policy and Program Studies Service.