

# ASSESSMENT AND PREPARATION OF CAREER AND TECHNICAL EDUCATION TEACHERS: IMPLICATIONS FOR CURRICULUM DEVELOPMENT

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**Index:** Vocational education; teacher preparation; career and technical teacher education; curriculum development; alternative teacher education; teacher quality.

**Abstract:** The study was designed to determine the preparedness of a cohort of career and technical teachers to meet the requirements of the contemporary classroom. Using the field-based, competency-based alternative teacher education model operated by Temple University, it was determined that Temple University's career and technical education teachers felt well prepared to meet the challenges of the contemporary classroom. It was also evident that there were both similarities and differences in how teachers in academic disciplines and teachers in career and technical fields perceived their readiness to teach the next generation of students. Indicators in the study further suggest that there may be identifiable pedagogical competencies that could provide a framework for developing the curriculum for career and technical teacher education.

## **INTRODUCTION**

In the next ten years the US educational system will educate 53 million young people and hire 2.2 million teachers (Riley, 1999). Several measures have been initiated at the national and state levels to meet this challenge. President Clinton proposed spending \$128 million to improve the quality of teaching through the training of teachers to integrate technology into the classroom (White House, 2000). The US Congress also passed the appropriations act for fiscal year 2000 and re-authorized the elementary and secondary education act that will begin to address the quality of teaching in the public schools (US Congress, 1999). In order to provide an insight into how reform could be achieved in teacher preparation, the US Department of Education (USDE) examined and reported on the quality of teacher preparation in the US public schools (USDE, 1999).

In the Commonwealth of Pennsylvania, similar concerns prompted Governor Ridge to unveil a program that will provide an alternative route to teacher certification (Pennsylvania Department of Education, 1999). Following the initiative of the state administration, the Pennsylvania State Board of Education adopted changes to the governing rules for teacher preparation and qualification that will enable the State to meet the needs of the contemporary classrooms (Pennsylvania State Board of Education, 1998). In addition, Pennsylvania initiated a unique partnership program that brought together Microsoft Corporation and State agencies to train and certify the Commonwealth's teachers in cutting-edge technology for the classroom (Pennsylvania Department of Education, 1998).

The goal of the various measures is to ensure that there is a talented and well-prepared teacher in every classroom (USDE, 1998). Despite these efforts, some educators and government administrators are concerned about the preparedness of teachers to meet the needs of the 21<sup>st</sup> Century classroom (American Federation of Teachers, 2000; Riley, 2000).

## **Background**

Educating the next generation of students and new teachers will weigh heavily on teachers presently in the workforce, and teacher education will assume a more significant role in developing teachers to meet the challenges of the classroom. However, in a study of teacher quality in the public schools - its preparation and qualifications - the USDE noted that less than half of public school teachers felt very well prepared to meet the challenges in the public school classroom (USDE, 1999). The study focused on teachers with academic assignments but did not reflect the perceptions of teachers who teach career and technical education subjects. Consequently, there was the felt need for a similar study that focused on career and technical education teachers, and a pilot study was designed for that purpose, using the career and technical teacher education program model of Temple University.

In addition to the traditional four-year campus-based approach, Temple University has utilized an alternative approach to prepare career and technical teachers for more than a quarter of a Century (Adamsky and Cotrell, 1975). The program is a field-based, competency-based model in which pedagogical experiences are provided to beginning career and technical teachers who enter secondary school classrooms directly from business and industry. The program is delivered off-campus through regional centers and individualized on-site helping conferences provided by Temple University teacher educators. To achieve program objectives, multiple teaching resources are employed, including individualized professional education plans, instructional modules and high-technology instructional media. The program enables teacher preparation to have a direct and immediate impact on career and technical students (Wash et al., 2000). It maintains a regular assessment schedule at various stages of delivery, with the overall goal to improve career and technical teacher education and its impact on career and technical education students (Hatfield and Gorman, 2000; Wise and Liebrand, 2000). The program, thus, provides a framework for examining the preparation of career and technical education teachers, and the present study was designed for that purpose.

## **The purpose of the study**

The purpose of this pilot study was twofold. It was designed a) to determine if a cohort of Pennsylvania career and technical teachers felt well prepared to meet the challenges of contemporary classrooms, and b) to examine the perceptions of graduates of an alternative career and technical teacher preparation program operated by Temple University against the perceptions of conventionally prepared general education teachers. The expectations were that, collecting this information would contribute to a discussion about program enhancements as well as the need for comprehensive studies of career and technical teachers in Pennsylvania and the United States.

## **Methods**

### ***Participants***

All participants in the study were practicing career and technical education teachers prepared through Temple University's field-based, competency-based alternative teacher education program. All had received Pennsylvania's Career and Technical Instructional Level II Certificate between 1990 and 1998, and all were certified in trade and industrial education subjects. One hundred and fifty-two teachers were identified in eastern Pennsylvania public schools.

### ***Instrument***

A survey questionnaire was developed, using information from the USDE's report on teacher quality and Temple University's field-based, alternative teacher education program. The questionnaire was divided into four sections relating to 1) situational data, 2) teacher education program characteristics, 3) program contribution to teacher preparation, and 4) perceived teacher preparedness. Sections 2, 3 and 4 of the instrument were designed to collect data on a six-point Likert scale.

### ***Data collection and Analysis***

One hundred and fifty-two questionnaires were mailed to practicing career and technical education teachers identified in eastern Pennsylvania, and 34 or 22.37 percent responses were returned. A test of the data for non-respondent bias yielded a Pearson correlation coefficient of .91 ( $r = .91, p \leq .01$ ), thus, confirming that the respondents adequately represented the population. The Statistical Package for Social Sciences (SPSS 4.1) was used to analyze the data, using descriptive statistical techniques and factor analytical techniques. A factor analysis of the variables resulted in 9 factors that formed the basis for discussing the implications of the findings. (See Table 1).

Table 1: Teacher Preparation Program: Factor Components and Related Elements

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Components	Elements
<ul style="list-style-type: none"><li>• Academic preparation</li></ul>	Coursework, basic academic skills, and clinical experience
<ul style="list-style-type: none"><li>• Curriculum and performance standards</li></ul>	Development, evaluation, implementation and utilization
<ul style="list-style-type: none"><li>• Diversity in the classroom</li></ul>	Working with students with diverse needs and backgrounds
<ul style="list-style-type: none"><li>• Learning environment</li></ul>	Access, facilities and resources
<ul style="list-style-type: none"><li>• Occupational competency</li></ul>	Professional knowledge and occupational skills
<ul style="list-style-type: none"><li>• Professional development</li></ul>	In-service staff development activities, workshops, academies, and professional conferences
<ul style="list-style-type: none"><li>• Support systems</li></ul>	Peer collaboration, administration's encouragement, community involvement, parents' participation and teacher networks,
<ul style="list-style-type: none"><li>• Teaching methods and skills</li></ul>	Planning strategies, delivery strategies, classroom management skills, student performance evaluation skills, and reflective teaching skills
<ul style="list-style-type: none"><li>• Technology</li></ul>	Evaluation, selection, and integration.

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## ***Findings***

The key findings are summarized under four categories: situational data, teacher education program characteristics, curriculum contribution to teacher preparation, and teachers' perceived preparedness.

### ***Situational data***

The findings indicated that a little more than 88 percent or 30/34 of career and technical teachers worked in their occupational fields for 5 years or more before making the career change to teaching. A little more than 44 percent or 15/34 of career and technical teachers held a 4-year college bachelor's degree or higher, and nearly all career and technical teachers, 97 percent or 33/34, taught subjects in the occupational field in which they were certified.

### ***Teacher education program characteristics***

The data analysis indicated that Temple University's career and technical teacher education program was designed to address all the components identified in a factor analysis and summarized in

Table 1

### ***Program contribution to teacher preparation***

- A very large number of career and technical teachers, 82.4 percent or 28/34, reported that their academic coursework contributed very much to their teacher preparation.
- A large number of career and technical teachers, 77.4 percent or 24/31, indicated that the use of state or school district curriculum contributed much to their teacher preparation.
- A very large number of career and technical teachers, 84.8 percent or 28/33, indicated that understanding the need to support students with disabilities contributed very much to their teacher preparation. Similarly, a large number of career and technical teachers, 64.0 percent or 16/25, reported that understanding the need to support students with culturally diverse backgrounds contributed somewhat to their teacher preparation.
- Nearly 90.0 percent or 30/34 of career and technical teachers reported that the learning environment contributed very much to their preparation for teaching.
- The vast majority, 93.7 percent or 30/32, of career and technical teachers reported that having an in-depth knowledge of their occupation contributed very much to their preparation for teaching.
- A little more than one-half, 52.9 percent or 18/34, of career and technical teachers reported that professional development activities contributed very much to their preparation to teach.
- A large number, 76.5 percent or 26/34, of career and technical teachers reported that all forms of support systems contributed very much to their preparation to teach.
- Nearly all career and technical teachers, 94.1 percent or 32/34, reported that the knowledge of effective teaching strategies contributed very much to their preparation for teaching.
- A large majority, 72.7 percent or 24/33, of career and technical teachers reported that the integration of educational technology into their curriculum contributed very much to their preparation for teaching.

### ***Perceived teacher preparedness***

- Nearly three-fourths of career and technical teachers, 73.5 percent or 25/34, reported that they felt well prepared or very well prepared to continue with academic coursework.

- A large majority, 78.8 percent or 26/33, of career and technical teachers reported feeling well prepared or very well prepared to implement state or school district curriculum and performance standards.
- A little more than one-half, 52.9 percent or 18/34, of career and technical teachers indicated that they felt well prepared or very well prepared to support the instructional technology needs of students with disabilities. However, only 38.2 percent or 13/34, of career and technical teachers reported feeling well prepared or very well prepared to serve the needs of students with limited proficiency in English.
- All career and technical teachers, 100 percent or 34/34, reported that they felt well prepared or very well prepared to provide instruction in their subject area.
- A large number, 69.7 percent or 23/33, of career and technical teachers indicated feeling well prepared or very well prepared to continue with professional development activities.
- Only 43.8 percent or 14/32 of career and technical teachers reported feeling well prepared or very well prepared to assist other teachers integrate computer technology into their curriculum.
- Nearly all career and technical teachers, 97.0 percent or 32/33, reported feeling well prepared or very well prepared to deliver instruction utilizing effective teaching methods and strategies.
- A little more than three-fourths, 76.5 percent or 26/34, of career and technical teachers reported feeling well prepared or very well prepared to integrate educational technology into their curriculum. However, only 21.6 percent or 6/28 indicated feeling very well prepared to employ innovative technologies such as the Internet and multimedia programs in delivering instruction.

The study found that there were similarities and differences in how teachers in academic disciplines and teachers in career and technical subjects perceived their preparedness to meet the demands of the contemporary classroom. Compared to 99 percent of teachers in academic disciplines, only 44 percent of teachers in career and technical education hold a 4-year college degree, baccalaureate or higher. However, compared to 97 percent of career and technical teachers, only 79 percent of English teachers, or 78 percent of mathematics teachers, or 89 percent of social studies/social science teachers teach the subject they are certified to teach. The following table summarizes differences in teachers' perceived readiness to implement program requirements in the classroom.

Table 2. Summary of Differences in Perceptions between Academic Teachers and Career and Technical Teachers about Teacher Preparedness for the Contemporary Classroom

Area of Preparation	Percentage of Teachers Well Prepared	
	Academic	Career and Technical
Integrating educational technology into instruction	20	76
Integrating new technologies such as the Internet into instruction	20	21
Meeting the needs of students with limited English proficiency	20	38
Supporting students with special needs such as disabilities	20	53
Using performance assessment instruments to evaluate students	28	43
Implementing new teaching methods and strategies	41	97
Implementing state or school district curriculum and performance standards	36	79

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## **Conclusions**

Four conclusions were made from indicators in the study. First, the findings indicated that career and technical education teachers felt well prepared to meet the needs of the contemporary classroom. Second, the findings indicated that certain program attributes facilitate teacher preparation and need to be included in career and technical teachers' curriculum. Third, career and technical education teachers need professional development in certain program aspects to enhance their competencies. Four, there are differences and similarities in how teachers in academic disciplines and career and technical education perceive their preparedness for the challenges of the contemporary classroom.

## **Implications for teacher preparation**

Indicators in this pilot study provide several lessons for career and technical teacher preparation and curriculum development. First, the indicators provide an insight into what teachers think about their preparation and what makes teacher preparation effective. Second, while a large number of career and technical teachers have indicated that they felt well prepared to meet students' needs in the emerging classrooms, the data indicate that there are still specific areas of concerns that need to be addressed, if teachers were to realize their full potential. In program areas such as technology integration, support for students with special needs or diverse backgrounds, and employing assessment and evaluation tools, career and technical teachers would benefit from staff development activities. Indicators in the study may well suggest that the identified program attributes provide a framework for curriculum development in career and technical teacher education (See Appendix A).

## **Recommendations**

Based on the preceding discussions, the following recommendations are made for future study.

1. A study should be conducted that examines the contribution of specific program components to the effectiveness of career and technical teacher preparation.
2. All participants in the study were certified in trade and industrial disciplines. Future studies should include teachers in other subject areas in career and technical education in order to provide a broader insight into teacher preparation in career and technical education.
3. This study was limited in scope and depth because of the small number of participants and it is recommended that the study is replicated with a larger population.

## **Summary**

Several million young people will be educated in the US in the next few decades and teacher preparation is key in meeting the needs of teachers for the next generation of students. A study by the US Department of Education provided an insight into the preparation and qualifications of teachers in the academic disciplines in the public schools, and thus, gave us a rationale for developing teachers in the academic disciplines for the contemporary classroom. However, the study left out career and technical education teachers. Therefore, the present study focused on teachers in career and technical education and found that teachers prepared through the alternative education program at Temple University felt well prepared to meet the challenges of the contemporary classroom. The study provided an insight into what career and technical education teachers perceived as contributing factors to their preparation to teach, and thus, gave us a protocol that may be considered in the design of career and technical teacher education curriculum.

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## APPENDIX

### Appendix A: A Framework for Developing Career and Technical Teacher Education Curriculum

Curriculum Component	Component Elements
Academic preparation	<ul style="list-style-type: none"> <li>• Coursework</li> <li>• Basic academic skills</li> <li>• Clinical experience</li> </ul>
Curriculum and performance standards	<ul style="list-style-type: none"> <li>• Development</li> <li>• Evaluation</li> <li>• Implementation</li> <li>• Utilization</li> </ul>
Diversity in the classroom	<ul style="list-style-type: none"> <li>• Working with students with diverse needs</li> <li>• Working with students with diverse backgrounds</li> </ul>
Learning environment	<ul style="list-style-type: none"> <li>• Access</li> <li>• Facilities</li> <li>• Resources</li> </ul>
Occupational competency	<ul style="list-style-type: none"> <li>• Professional knowledge</li> <li>• Occupational skill</li> </ul>
Professional development	<ul style="list-style-type: none"> <li>• In-service staff development activities</li> <li>• Workshops</li> <li>• Seminars and academies</li> <li>• Professional conferences</li> </ul>
Support systems	<ul style="list-style-type: none"> <li>• Peer collaboration</li> <li>• Teacher networks</li> <li>• Administrative encouragement</li> <li>• Community involvement</li> <li>• Parents' participation</li> </ul>
Teaching methods and skills	<ul style="list-style-type: none"> <li>• Planning strategies</li> <li>• Delivery strategies</li> <li>• Classroom management skills</li> <li>• Student performance evaluation skills</li> <li>• Reflective teaching skills</li> </ul>
Technology	<ul style="list-style-type: none"> <li>• Evaluation</li> <li>• Selection</li> <li>• Integration</li> </ul>