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Teacher Perspectives on Performance Based Student Assessment in Career and Technical Education in West Virginia Public Schools

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TEACHER PERSPECTIVES ON PERFORMANCE BASED STUDENT ASSESSMENT IN CAREER AND TECHNICAL EDUCATION IN WEST VIRGINIA PUBLIC SCHOOLS

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By
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DEDICATION

This work is dedicated to the career and technical education administrators and teachers who strive to prepare secondary and adult students for entry-level employment in the rapidly evolving global workplace. Through collaborative efforts of business, industry, and education, today's student may complete secondary or post-secondary education with marketable skill sets sought by employers in today's complex job market. The interest and participation of West Virginia career and technical educators in this statewide study exemplify the definition of effective stakeholder involvement in program evaluation and curriculum design.

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ABSTRACT

The purpose of this study was to investigate career and technical education teachers' level of knowledge and use of performance based student assessment practices in West Virginia's secondary and post-secondary career education centers. In addition, this study sought to determine what relationships, if any, exist between levels of knowledge and use of performance based student assessment practices. Finally, this study described factors identified by respondents as supports or barriers to implementation of performance based student assessment.

A researcher-developed survey was used to collect data. The study population consisted of engineering, hospitality and health occupations teachers in career and technical education programs in West Virginia's public schools. Four hundred and fourteen career and technical education educators from 48 West Virginia career and technical education facilities responded to the survey.

Teachers reported good to very good knowledge of performance based student assessment practices and indicated they were using a majority of the practices on a regular to frequent basis. Teacher knowledge of practices was significantly different based on years of teaching experience and participation in training on performance based student assessment practices. The correlation between levels of knowledge and use totals was significant and moderately strong.

Teacher support from administration was identified most often as a supporting factor for teacher implementation of performance based student assessment practices. Lack of time, resources, and infrastructure were factors most often identified as barriers to implementation of performance based student assessment practices.

CHAPTER ONE: INTRODUCTION

West Virginia career and technical education content standards have been revised to address 21st Century Learning and GLOBAL21 initiatives (West Virginia Department of Education, 2008, 2009$_b$, 2010$_a$). The result is a higher level of accountability for career and technical educators as they strive to provide evidence of student mastery of content standards and objectives in all three domains of learning (cognitive, psychomotor, and affective). Teachers must comply with state policy and any inherent federal and state mandates in order for their career cluster student completers to be eligible for certification in field upon graduation (West Virginia Department of Education, 2010$_a$).

In 2009, the West Virginia Department of Education Division of Career, Technical, and Institutional Education adopted a performance based student assessment model. The goal of this model was to ensure optimal student preparation and effective summative evaluation of student mastery of content, technical skills, and global learning elements identified by employers as necessary to function in the 21st Century workplace (West Virginia Department of Education, 2009$_b$). Program developers expressed a desire to be among the first states to adopt a performance based student assessment model in order to maintain a progressive stance in preparing career and technical education students for entry into the competitive global workforce. They expressed the expectation that administrators and teachers would embrace research-based best practices and appreciate the importance of tying assessment strategies to the desires and demands of the community. West Virginia Department of Education officials expressed an intent to design professional development opportunities which would support teachers in developing the

knowledge base and confidence to effectively and efficiently coordinate performance based student assessment (West Virginia Department of Education, 2009_a).

After one year during which the performance based student assessment model was piloted in a selected group of schools, and two years of statewide implementation of the performance based student assessment model, there had been no statewide assessment of teacher knowledge and use of these practices. The result of such an assessment would provide a database for future program planning by establishing a baseline description of current teacher levels of knowledge and use of performance based student assessment practices in their classrooms. Therefore, this study sought to describe CTE teachers' perspectives on their levels of knowledge and use of performance based student assessment practices fundamental to preparing students for the West Virginia Career and Technical Education Performance Based Assessment (West Virginia Department of Education, 2010_b, 2011).

Problem Statement

A model for performance based student assessment was adopted by the West Virginia Department of Education, Division of Career and Technical Education in 2009, piloted for one year in selected schools, and implemented statewide by over 500 engineering, technical, hospitality, and health occupations teachers the following year. During that time, training was provided on a regional and local basis by individuals from the WVDE. An assessment implementation manual was developed and posted on the West Virginia Department of Education website for teacher reference (West Virginia Department of Education, 2009_a). One of the required courses for new CTE teachers seeking teaching certification addressed student assessment methods in career and technical education; however, the existing course syllabus did not mention GLOBAL21 Performance Based Assessment, nor did any assignments or learning

activities within that course relate to the newly adopted West Virginia performance based student assessment model (West Virginia University Institute of Technology, 2010a, 2010_b). A research-based description of existing levels of teacher knowledge and use of performance based assessment practices did not exist at the beginning of the 2011-2012 school year. The overarching question for this study, then, was to what extent do teachers in West Virginia's career and technical education programs possess fundamental knowledge of performance based student assessment and use performance based student assessment practices in their classrooms. Secondarily, the study also sought to determine the relationship between teacher knowledge and use of performance based student assessment practices, and to identify the major supports and barriers to implementing a performance based student assessment model.

Research Questions

The following research questions were investigated:

1. What is the West Virginia career and technical education teacher's level of knowledge about performance based student assessment practices?
2. What is the West Virginia career and technical education teacher's level of use of performance based student assessment practices?
3. What relationships, if any, exist between the West Virginia career and technical education teacher's level of knowledge about performance based student assessment practice and their level of use of those practices?
4. What factors, if any, do West Virginia career and technical education teachers identify as supports to their efforts to implement performance based student assessment?

5. What factors, if any, do West Virginia career and technical education teachers identify as barriers to their efforts to implement performance based student assessment?

Operational Definitions

The following variables were operationally defined for use in this study:

Level of knowledge about performance based student assessment practices – an individual teacher's perception of his/her personal level of knowledge about performance based student assessment practices as self-reported on the survey instrument, *Performance Based Student Assessment in Career and Technical Education*, using the five point descriptive scale (1 = poor; 2 = fair; 3 = good; 4 = very good; and 5 = exceptional) provided for each assessment practice included in Part B, Column A of the survey instrument.

Level of knowledge about performance based student assessment practice clusters – an individual teacher's perception of his/her personal level of knowledge about performance based student assessment practices as self-reported on the survey instrument, *Performance Based Student Assessment in Career and Technical Education*, using the five point descriptive scale (1 = poor; 2 = fair; 3 = good; 4 = very good; and 5 = exceptional) provided for each assessment practice included in Part B, Column A of the survey instrument; individual cluster knowledge level scores were calculated by summing the responses to the five individual assessment practices in each cluster.

Total level of knowledge about performance based student assessment practices – an individual teacher's perception of his/her personal level of knowledge about performance based student assessment practices as self-reported on the survey instrument, *Performance Based Student Assessment in Career and Technical*

Education, using the five point descriptive scale (1 = poor; 2 = fair; 3 = good; 4 = very good; and 5 = exceptional) provided for each assessment practice included in Part B, Column A of the survey instrument; individual total knowledge scores were calculated by summing the responses to each of the 20 individual assessment practices in Part B, Column A of the survey instrument.

Level of use of performance based student assessment practices – an individual teacher's level of use of performance based student assessment practices as self-reported on the survey instrument, *Performance Based Student Assessment in Career and Technical Education*, using the five point descriptive scale (1 = seldom; 2 = sometimes; 3 = regularly; 4 = frequently; and 5 = very frequently) provided for each assessment practice included in Part B, Column B of the survey instrument.

Level of use of performance based student assessment practice clusters – an individual teacher's level of use of performance based student assessment practices as self-reported on the survey instrument, *Performance Based Student Assessment in Career and Technical Education*, using the five point descriptive scale (1 = seldom; 2 = sometimes; 3 = regularly; 4 = frequently; and 5 = very frequently) provided for each assessment practice included in Part B, Column B of the survey instrument; individual cluster use level scores were calculated by summing the responses to the five individual assessment practices in each cluster.

Total level of use of performance based student assessment practices – an individual teacher's level of use of performance based student assessment practices as self-reported on the survey instrument, *Performance Based Student Assessment in Career and Technical Education*, using the five point descriptive scale (1 = seldom; 2 = sometimes; 3 = regularly; 4 = frequently; and 5 = very frequently) provided for each assessment practice included in Part B, Column B of the survey instrument; individual

total use scores were calculated by summing the responses to each of the 20 individual assessment practices in Part B, Column B of the survey instrument.

Supports – factors identified by teachers as being positive or helpful influences in their efforts to implement performance based student assessment. These data were collected from participant responses to an open-ended question in Part C, Item 1 of the survey instrument, *Performance Based Student Assessment in Career and Technical Education*.

Barriers – factors identified by teachers as being negative or obstructive influences in their efforts to implement performance based student assessment. These data were collected from participant responses to an open-ended question in Part C, Item 2 on the survey instrument*, Performance Based Student Assessment in Career and Technical Education*.

Significance of the Study

Career and technical education teachers are expected to provide learning activities and formative assessments which will prepare all students for performance based assessment upon completion of courses or programs. Results of this study can be used to inform the development of curricula for career and technical administrator and teacher preparation and professional development programs. Data from this study may also be of interest to state and local career and technical education policy makers as they allocate funding and resources. The available literature is also sparse relative to guidelines or tools by which CTE teacher competencies related to management of performance based assessment may be addressed in teacher performance evaluations. Study findings may also be useful as a basis for evaluation of current teacher preparation programs for performance based student assessment content and as a guide for teacher professional development and program revision with respect to

performance based student assessment, especially in the career and technical education program cluster areas.

Delimitations of the Study

This study was limited to describing the knowledge and use of performance based student assessment practices by teachers of engineering, technical, hospitality and health occupations education clusters in the career and technical education programs in West Virginia. CTE teachers in public comprehensive high schools, county career centers, and multi-county career centers, including institutional schools, were included in this study.

Organization of the Study

Chapter One provides an introduction to the study. Chapter Two contains a review of the related literature. Chapter Three outlines the research method and data collection procedure. Chapter Four presents study findings. Chapter Five provides a study summary, presents conclusions, provides a discussion and implications section, and presents recommendations for additional research.

CHAPTER TWO: REVIEW OF THE LITERATURE

Introduction

This chapter will provide a summary of literature relevant to this study. The review is divided in five sections. Section one describes the history and development of performance based student assessment. Section two presents a brief history of performance based student assessment in West Virginia career and technical education. Section three describes the West Virginia career and technical education pilot performance based student assessment. Section four summarizes research related to the use and effectiveness of performance based student assessment. Section five explores selected variables and their impact relative to teacher capacity to successfully implement performance based student assessment in their classrooms.

Performance Based Student Assessment: History and Concept Development

Since the 1970s, career and technical education (CTE) teachers have been charged with assessing student achievement in the program content area upon completion of the program through "end-of-course" computer based cognitive (standardized) content knowledge tests. Although there are mechanisms in place for students to be evaluated on individual hands-on skills as they progress through a career-preparation program, there was no requirement for summative evaluation of anything other than the content knowledge. During the 1990s, researchers, policy makers, and business and industry partners engaged in dialogue exploring the value and feasibility of broadening the summative assessment of career and technical (formerly known as vocational) students to include skills that would serve the student completers to be prepared to compete in the global society as well as in the workplace. Congress received a 1994 report on [then] vocational education in which

the idea of pursuing more authentic student assessment methods was mentioned (Boesel et al., 1994).

Apling (1989) pointed out that the Perkins Act of 1984 mandated that states were to develop methods to measure the effectiveness of programs which would address hiring needs identified by potential employers. One outcome of this legislation was the beginning of a new chapter in vocational education's collaboration with business and industry as partners in program evaluation, curriculum development and work-based learning.

In the early 1990s, both general education and vocational education focused primarily on the cognitive domain in summative measures of student achievement. In "Authentic Assessment: Progressive Evaluation of American Student Performance," Howard (1992) observed that educators were receiving a general mandate from the community, business, and industry to make students' educational experiences more relevant to the "real" worlds of society and work. Howard detailed the growth of interest in performance-based assessment from the 1950s through the 1990s and lamented that educators seemed to have difficulty reconciling success and consistency in coordinating school with preparation for the workplace. Howard viewed the relationship of educational policy and practice as a dilemma, seeing general (academic) education's approach to authentic assessment as completely different from the approach taken by vocational education. Howard (1992) suggested that there could only be "authenticity" in a student assessment model if it included pieces that addressed both knowledge and skill. Howard's comments preceded the 1988 basic academic skills and career-prep skills integration initiative which grew from the Southern Regional Education Board's (SREB) School to Work (STW) project (Southern Regional Education Board, 1988).

Work-based and cooperative learning activities are inherent in the career and technical education curriculum. As CTE teachers and general education teachers progress toward team teaching and integration across the curriculum, researchers explore options to meet accountability demands of the public and private sector for graduates to possess skills other than knowledge for entry into the workplace and productive society. In the first decade of the 21st Century, West Virginia became one of 43 states involved in the initiative to develop common-core academic standards, with the goal of improving benchmarks by which to document a student's readiness for higher education and/or entry into the workplace. Although the initial focus was on language and mathematics, the group engaged in expansive dialogue regarding the need for high school students to graduate with much more than content knowledge. Some of those additional skills identified included higher-order thinking, communication, teamwork, problem-solving and application of content knowledge in work and society (Common Core Standards Initiative, 2010).

Langer and Applebee (1988) contend that, to be effective, learning must include not only subject knowledge and skill development, but also facilitation of global workplace skills and beliefs, critical thinking, perception, and an ability to examine and make decisions based on how situations and issues relate to the larger environment (Langer & Applebee, 1988). This is a fundamental premise of performance based learning and assessment.

McLaughlin and Warren (1994) advocated performance based student assessment for all students, but cautioned that student success would be facilitated within the performance based model only if fundamental systemic support strategies were included. McLaughlin and Warren identified essential support strategies including: identification of meaningful outcomes, definition of performance

standards to emphasize growth, accommodation of individual student needs through flexibility in the assessment model, employment of multiple data-gathering strategies, examples of student work, formative assessments, and teacher judgments on student performance (McLaughlin & Warren, 1994).

Whereas career and technical (vocational) education has generally been referred to as hands-on, Johnson (1991) articulated the belief that employees no longer can opt for simply spending their working hours performing repetitive skills. On the contrary, those technical skills must be accompanied by the ability to apply concepts, think creatively, solve problems, and make decisions (Maclean & Ordonez, 2007).

Historically, vocational or career and technical education has been the primary platform for secondary and post-secondary public school students to explore career pathways in industrial, trade, technology, service and health related occupations. Since the 1940s, public schools have offered job-specific curriculum as a means of preparing students to be qualified/trained in entry-level job skills (Lynch, 2000). Hamilton (2010), a behavioral scientist, suggests that effective accountability policy depends on a number of considerations, such as whether to focus on individual or group performance, current achievement or evidence of growth, fixed targets or participant rankings—all of which, according to Hamilton, will determine whether a policy and its resultant assessment models will promote program improvement and provide maximum benefit to students. Another decision which will contribute to summative assessment model effectiveness is whether or not adequate formative assessment has been built into the program curriculum (Hamilton, 2010).

Richard Lynch (2000) identified four aspects of standardized cognitive testing which he found especially troublesome. Based on his years as a nationwide

consultant for CTE program evaluation, Lynch observed that: (1) research does not definitively support standardized cognitive testing as the best summative indicator of student mastery and/or effective teaching, (2) the process of filling in a space on a test answer sheet does not always measure what students know, demonstrate critical thinking, provide evidence of problem solving skills, or other job-seeking, job-keeping, communication or global team building skills that employers ask for in entry-level workers, (3) people generally do not consider standardized cognitive tests as "fair," even though there seem to be elaborate guidelines and multi-level efforts to ensure relevance and opportunity for success for marginal and at-risk students, and (4) standardized tests are often described as the best measure of student achievement. Career and technical education collaborates with business and industry representatives to maintain alignment of curriculum with current industry standards and employer needs.

Lynch (2000) further maintains that cognitive testing is, indeed, important, but should not be the singular assessment method. Rather, Lynch reasons that cognitive testing should be employed in conjunction with multiple, authentic assessment tools and strategies, with the result being valid evidence of not only knowledge of content, but technical skills, global workplace skills, and societal/life skills as well. Lynch believes that CTE educators are positioned to lead the way in authentic, performance based student assessment by the very nature of career and technical education. Lynch further suggests several strategies and artifacts which might be utilized to provide such diverse and formative evidence of student progress, including portfolios, demonstrations, oral and written reports, work-based performance reports, presentations, and products of a completed technical process. He also argued that the

learner would ideally have input into the assessment process and selection of assessment tools (Lynch, 2000).

In 2005, Stone and Aliaga prepared a status report on the School To Work initiative which professed that the preparation of today's students for the global workplace and society is becoming more important with time, and that teachers accountable for this preparation must be prepared for the task (Stone & Aliaga, 2005). Today, the SREB directs High Schools That Work (HSTW) and similar projects developed by the consortium in an effort to describe the current career and technical learning and student assessment environment, and relate career and technical curriculum and instructional delivery to current business and industry needs and standards (Southern Regional Education Board, 2010). Career and technical educators argue that it is not enough for an individual to come into vocational teaching from business and industry with advanced technical skills—in order to have credibility in preparing and assessing student progress, that teacher should be able to demonstrate the capacity for curriculum development and measurement of student progress (Association for Career and Technical Education, 2009).

By the end of the first decade of the 21st century, performance based student assessment was being adopted across the curriculum, with lengthy discourse among strategists on why performance based assessment may be expected to serve students better than standardized testing. An online forum (TeAchnology, 2012) asked professional teacher readers to identify key characteristics of performance based multiple assessments and discuss whether or not they believed performance based assessment models produced better students, as opposed to the traditional question and answer assessment format. Forum participants generally described traditional assessments as focusing on student knowledge of principles and theories, judged by

written answers to questions or online entry of correct answer selection. Conversely, the teachers responding in the forum described performance based assessments as testing student understanding of the principles and theories by requiring practical application of the principles and concepts.

Forum participants (teachers) identified characteristics and strategies of performance based assessment which they felt were supportive in preparing students for successfully demonstrating mastery of skills and knowledge. According to the forum, performance based assessments get students excited, require students to analyze and present findings in class, require students to practice oral and written communication, facilitate public speaking skills, practice peer assessment, engage in project based learning, group/team work, peer tutoring, cooperation, group identity, and support development of individual self-confidence. In addition, performance assessments provide opportunities for portfolio building, skill set development based on previous learning, self-assessment, and foster the perspective of formative assessment as a part of the learning process. Forum participants recognized that use of a performance assessment model enables teachers to learn if their students can demonstrate application of their learned knowledge in a simulated work situation, while students are supported in taking responsibility for their own learning and develop an appreciation for learning techniques other than memorization. Finally, the teachers interacting on the forum offered consensus that performance based student assessment is optimal if combined with traditional student assessment/testing, in order to provide what they termed "holistic" education for every student (TeAchnology, 2012).

In their 2010 CRESST report, Behrens' research group (Behrens, Mislevy, DiCerbo, & Levy, 2010) asserted the belief that the 21st century would hold

increasing transformations of society, technology, and the individual. Behrens predicted that electronic learning would be the norm, and that students would have to learn what educators refer to as 21st century skills, including planning, design, implementation, operating skills, troubleshooting, physical aspects of connectivity, organization, language, self and peer-assessment, and would be required to deal with multiple feedback mechanisms. Students should expect electronic and other quizzes and tests, simulation challenge labs, performance/simulation based practice activities, end-of-course fixed-response exams, and end-of-course simulation and performance based exams (Behrens et al., 2010).

Performance Based Student Assessment in West Virginia

West Virginia was a member of the original consortium of southern states which piloted the School To Work (STW) model in vocational education. This model included the preparation of teachers to imbed basic comprehension, language expression and technical math skills into the career-preparation curriculum (Southern Regional Education Board, 1988). West Virginia University Institute of Technology (at that time West Virginia Tech) career and technical teacher preparation program faculty administered surveys and took an active role in gathering data and disseminating information regarding STW in an effort to ensure a level of comfort and preparedness for new teachers entering the CTE classroom directly from business and industry, as they carried out unfamiliar program management responsibilities in the school setting.

Watson and Robbins (2008) described the vocational realm of education as inherently social, with knowledgeable individuals responsible for guiding the learner, and as reliant on the judgment of business and industry professionals to lend authenticity to the assessment of knowledge and skills, process, and product. This

explanation closely parallels the published intent of student performance assessment in 21st century career and technical education (West Virginia Department of Education , 2009_b), and in the GLOBAL21 assessment model adopted in West Virginia (West Virginia Department of Education, 2009_a).

In 2010, West Virginia Department of Career and Technical Education administrators continued to address Perkins Act (United States Department of Education, 2006) requirements by establishing an active state advisory board comprised of representatives of employers in the engineering, technical, hospitality, business, and health occupations throughout the state. The advisory board helps education administrators define appropriate skill sets for entry level workers, which then drive the development of core standards and assessment strategies for West Virginia's secondary and adult career centered educational programs. These skill sets are fundamental components of the framework of the GLOBAL21 performance based student assessment (West Virginia Department of Education, 2011).

The mission of West Virginia career and technical education programs is to produce highly skilled students who will be the face of West Virginia's highly skilled workforce (West Virginia Department of Education, 2011). The introduction to the career and technical division on the WVDE website describes performance assessment as a means to judge students' abilities to apply specific knowledge and research skills in a hands-on platform. The introduction passage asserts that performance assessments often require a student to manipulate special equipment to solve a problem, and that such multi-faceted testing provides insight into a student's conceptual and procedural knowledge (West Virginia Department of Education, 2011).

By 2011, job-specific knowledge and skills was one of four skill clusters which was reflected in West Virginia career and technical education curriculum objectives. The other skill clusters, referenced in the GLOBAL21 education initiative, included information and communication skills, thinking and problem solving skills, and personal and workplace productivity skills. Together, these four skill clusters became the framework for the student assessment practices included in the GLOBAL21 Student Assessment model adopted by the WVDE Division of Career, Technical, Adult and Institutional Education (West Virginia Department of Education, 2010_a).

Based on conversations with peers from other states and collaboration with SREB and other regional technical education professional groups, West Virginia state and local CTE administrators began considering, or in some cases, using, some performance based student assessment tools and strategies during the late 1990s (Hopkins, 2009); however, there was no standardization of the multi-layer assessment approach statewide. This statewide standardization of assessment methodology would become a goal of the West Virginia Department of Education, Division of CTE, as the performance based assessment project evolved (Hopkins, 2009).

With the advent of the 21st century, there was a collaborative effort involving policy makers, education administrators, and representatives of business and industry to maximize entry-level skills (including both technical and soft skills) by the time a student completed a secondary or post-secondary career technical program in the public schools. In 2008, a focus group of West Virginia career and technical education (CTE) administrators, program cluster coordinators, teachers, related industry and business representatives collaborated to choose a model for student assessment which they felt would be more efficient in determining readiness than the

previous end-of-course testing which was essentially a computer-based testing of content knowledge. The collaborative was assembled several times over a period of months. An authentic student assessment model used by the Texas Department of Career and Technical Education was viewed as one which could be modified for use with West Virginia CTE students (Texas Department of Education, 2008).

The consensus of the West Virginia CTE coordinators was that the only way to address assessment authentically and comprehensively in a career and technical career cluster program was to employ a multi-disciplinary model through which students would provide experiential learning in the three domains (cognitive, psychomotor, and affective) with direct interaction with a panel of business and industry supervisors who could address readiness for entry into the current work environment (West Virginia Department of Education, 2009_b). Thus began the period during which WVDE administrators began to adapt components of the Texas model for performance based student assessment to the West Virginia career and technical education framework, and the West Virginia model began to evolve (Texas Department of Education, 2008; West Virginia Department of Education, 2009_a).

West Virginia CTE coordinators at the state level gleaned additional support from information provided by Charles Backes, a peer from Valdosta State University, who attended many professional gatherings with West Virginia officials. In a 2009 article, Backes contended that student assessment must change to include more than just testing of content (knowledge), but must also provide evidence of mastery in comprehensive job-seeking, job-keeping, team-building, craft/trade/work skills, and professional/technical writing and speaking skills, and technology appropriate to the workplace and society. Backes challenged 21st Century career and technical educators to look beyond the written test and incorporate portfolios, work-based

project completion, interviews and student presentations into the summative assessment practices (Backes, 2009).

Performance Based Student Assessment: The West Virginia Pilot Model

The West Virginia Performance Based Student Assessment project was launched in seven pilot counties in April 2009, with statewide implementation scheduled for 2010. A state department of education coordinator was employed to oversee the pilot project and the first year statewide implementation. Administrators and teachers were given a handbook, adapted from California and Texas programs (California Department of Education, 2000; Texas Department of Education, 2008). The handbook listed requirements for securing representatives from business and industry, scheduling of the test days, test item samples and strict guidelines of time window, confidentiality, and assessment content. Test items would be provided under strict confidentiality by the WVDE with minimal input from teachers. The new assessment project was introduced during January, ten weeks prior to the initial pilot testing period in April 2009.

During and after the spring 2009 assessment process, feedback from across the state to the state assessment coordinator prompted concern for appropriate teacher preparation and revealed a need to address a high level of anxiety among those charged with carrying out performance based student assessment at the classroom level. State administrators reported they were hearing teachers express discomfort about the first year experience, and it was suggested that negative first experiences might impede teacher acceptance and cooperation in preparation for the 2010 statewide implementation (West Virginia Career and Technical Administrators, 2010).

This concern was supported by observations of current educational assessment experts, including University of Toronto professor, Michael Fullan. Fullan (2002) argues that the key to educational reform is to facilitate maximum capacity for change at the school level, and to provide all players (stakeholders in the educational process) with information and training which will lead to buy-in to any new process. Fullan also cautions program administrators that, unless participants find meaning in an educational reform, that reform will not have a desirable impact. The state assessment coordinator was directed by the assistant state superintendent of schools to take immediate steps to remedy the situation in order to maintain cooperation and support of educators for the new assessment model (West Virginia Career and Technical Administrators, 2009).

The state coordinator of the performance based student assessment program enlisted the assistance of career cluster program coordinators (engineering, technical, hospitality, and health science technology coordinators at the state level) to proceed with a formal debriefing of administrators, teachers, and others, with the intent to better meet the training and support needs of those directly involved with the assessment process. State coordinators assembled focus groups comprised of administrators, teachers, and business and industry representatives involved in the pilot project and presented feedback to the career and technical administrators' assembly (West Virginia Career and Technical Administrators, 2009).

Focus group participants identified key concerns they felt must be addressed to ensure a successful statewide implementation. The list of key concerns included: insufficient teacher input into test items (cognitive and psychomotor), discomfort with the requirement that the teacher be removed from the testing area to prevent influence during the testing process, lack of opportunity for students to interact with and receive

feedback from evaluators upon completion of the assessment, no formal debriefing of or feedback from evaluators upon completion of the assessment, inadequate orientation and training for teachers, inadequate understanding of students regarding the performance assessment model, and a perceived lack of input from administrators and teachers in redesigning a model to one which more closely relates to the West Virginia business and industry environment and the West Virginia career-preparation curriculum and students (West Virginia Department of Education, 2009_a).

Also, during the debriefing, there were reports of fundamental issues during the process, including difficulty securing business and industry representatives to serve as judges for an entire school day, lack of test item relevance to program standards, inadequate materials for hands-on assessment projects, teachers unsure how to address students with special needs for the assessment, teacher lack of understanding of the project, minimal time (a few weeks) for students preparation, and administrators unsure of protocol boundaries on test security, and discussion allowed with parents, students and teachers prior to and after testing. Teachers reported a general frustration with the preparation they were given during the weeks prior to the initial testing (West Virginia Department of Education, 2009_a).

Focus group participants expressed a concern that a model developed from models from other states may not be relevant to West Virginia students, teachers, and business and industry employers. Participants reported a generalized feeling of discomfort and resistance to compliance with implementation of the assessment model. Additionally, because student completers were being tested near the end of the spring semester, a common concern for administrators, teachers, and students was the absence of such an assessment plan during the two or three prior years current students had received instruction in the career and technical program fundamentals.

There were multiple comments expressing concern that students were being short-changed in their core courses and enhancement courses because of the time and preparation necessary to get ready for the CTE performance based assessment week. Based on a preliminary feedback report presented to administrators, most were left wondering if they had attempted to institute the pilot testing project prematurely, and concern was expressed that the project might not be salvageable if teacher anxiety and dissatisfaction were not swiftly addressed (West Virginia Career and Technical Administrators, 2009).

Many of the concerns expressed by teachers after the initial two performance testing periods were from newly employed teachers who had not yet taken the required courses and whose knowledge of methods of student assessment, in general, could be described as minimal, at best. Within the next year, there would be evidence that some teachers leaving the classroom within the first year of employment would identify a stressful experience with performance based student assessment as the primary reason for leaving their positions (West Virginia University Institute of Technology, 2010_c). The teacher education faculty acknowledged a need for immediate evaluation of the existing new teacher induction and professional development content to determine the revisions needed to include an immediate introduction to the state-adopted, performance based CTE student assessment model and more concentrated support for teachers as they prepare for their first experience implementing the annual performance based CTE student assessment process (West Virginia University Institute of Technology, 2010_b).

Anecdotal evidence from formal and informal feedback, as discussed in quarterly statewide CTE administrators' meetings (West Virginia Career and Technical Administrators, 2010), suggested teachers generally expressed feelings of

being inadequately informed, lacking knowledge of the principles of performance assessment strategies, and having inadequate preparation for implementation of performance based student assessment practices. Administrators recognized that some major adjustments would be necessary if teachers were to buy in to the assessment model and integrate performance based student assessment in their instructional program. Discussion among program coordinators led to minor revisions in the performance based student assessment model, and the first statewide implementation proceeded as scheduled in April 2010 (West Virginia Department of Education, 2010_a).

At the conclusion of the first statewide performance based student assessment, teacher debriefing revealed continuing questions and concerns from those who had participated in the process (West Virginia Career and Technical Administrators, 2010). The Career and Technical Education Division of the West Virginia Department of Education was faced with addressing the capacity of teachers to manage instruction, and implement student assessment within the new model. During exit interviews in 2010, eleven West Virginia teachers who left the classroom to return to business and industry before the end of their first two years of teaching disclosed feelings of inadequate knowledge of performance based student assessment, and lamented lack of support for implementation of performance based student assessment during the first year on the job (West Virginia University Institute of Technology, 2010_c).

As state department administrators planned the third round of the performance based student assessment model, these concerns were discussed during the 2010 West Virginia Career and Technical Education Conference. The discussion focused on the efficacy of the model, administrator and teacher roles and responsibilities, state

assessment coordinator role, teacher preparation, and support for implementation. Conference proceedings document discussion of several fundamental questions--Does the business model character of the performance based CTE student assessment impact teacher/administrator perception of relevance to educational goals? Does the stakeholder involvement model of the West Virginia Department of Education delineate appropriate, efficient, and effective collaborative roles and responsibilities for business and industry representatives in curriculum management and program evaluation? Are teachers sufficiently knowledgeable about and prepared for their roles as coordinators of the annual performance based student assessment (West Virginia Career and Technical Administrators, 2010)?

State level administrators began to examine implications for administrators and teachers in terms of instructional planning, managing instructional time to include the performance based assessment, providing formative student assessment, maximizing student access to and mastery of core and other elective content, and forging collaborative relationships with business and industry partners for long-term support of CTE programming. The success of CTE programming, they believed, hinges on successful integration of a performance based student assessment model (West Virginia Department of Education, 2010_a).

Performance Based Student Assessment: Research

A 2009 case study in Malaysia sought to identify characteristics and skill sets desired by employers with respect to entry level employees, and to identify how employees viewed those same characteristics and skill sets with respect to necessity for employment (Lie, Pang, & Mansur, 2009). With reference to the National Research Institute for Higher Education or *Institut Penyelidikan Pendidikan Tinggi Negara* (IPPTN) case study, and a conceptual framework developed by Lie (2006,

2007), researchers developed a survey instrument built around the eight employability literacies identified by Lie (2006, 2007). Those employability literacies identified included linguistic proficiency, communicative literacy, culture awareness, content literacy, sustainable citizenship, attitude and mindset, vocational literacy and critical literacy. Lie's employability literacies show similar scope and content to the American 21st Century and GLOBAL21 workplace skill clusters referenced elsewhere in this section.

The Malaysian study (Lie et al., 2009) found that employers placed emphasis on general entry-level skills including language, current knowledge, communication skills, problem solving, critical thinking skills, motivation, technical expertise and work based experience. Entry-level workers placed more emphasis on technical skills, but generally concurred with employers on the other literacies.

Conclusions drawn from the study suggested university faculty could successfully meet the needs of the student preparing for entry level employment only if [faculty] exhibited a command of the language (English and technical), the skills to effectively model workplace skills, and application of knowledge, and attitudes supportive to team concept and organizational productivity. Further, data supported the recommendation that literacies/skill sets required by employers drive curriculum revision and professional development for faculty (Lie, et al., 2009).

A study of social studies teachers in Nigeria evaluated teacher factors relationship to perceived needs related to assessment practices. Variables included attitude toward content areas, gender, teaching experience and educational qualifications. Social studies teachers from 116 secondary schools in one Nigerian state responded to the Teacher Classroom Assessment Practices Needs Questionnaire (TCANQ) and Teacher Attitude Toward Social Studies Inventory. Results indicated

that gender and teacher qualification significantly influence perceived assessment practices needs of social studies teachers. Significant positive relationships were shown between years of teaching experience and expressed assessment practices needs and between attitude towards social studies and assessment needs. Conclusions were that years of teaching experience, attitude toward content, gender and educational qualifications significantly influence teachers' perceived priority needs related to assessment practices (Ekuri, Egbai, & Ita, 2011). This research contributed to the rationale for the evolving West Virginia performance based student assessment model.

A study in the Netherlands (Gulikers, Bastianens, Kirschner, & Kester, 2006) focused on perceptions of authentic performance based assessment by senior secondary vocational students. Findings of this study showed the students assessed with the performance based model evidenced slightly decreased scope of knowledge, a bit contrary to researcher expectations. This led to the conclusion that a more specific task focus, with step-by-step performance steps might slightly diminish learner motivation and depth of concept comprehension.

Research is ongoing to provide a foundation for development and implementation of relevant and cost-effective performance based assessments for program completers in career and technical education. In 2011, a study sought to identify differences in cognitive and performance assessment scores in an engineering drafting course. The study involved high school students and results showed no significant differences between performance and cognitive assessment results in that particular group of 92 students. The researchers recommended further research with other program area populations and using additional research methods (Fahrer, Ernst, Branoff, & Clark, 2011).

In 2008, Gulikers led another team in studying the differences between perceptions of teachers and students related to the influence of assessment model to student preparation for the assessment process. Findings of the study showed teachers perceived more relevance of assessment characteristics than did students. Also, prior experiences with activities requiring application of knowledge did not appear to have significant influence on student perceptions of relevance of assessment characteristics. The conclusion was that teacher and student involvement in assessment model development is desirable to model relevance, teacher efficacy, and student benefit (Gulikers, Bastianens, Kirschner, & Kester, 2008).

In a recap of predictors of student success beyond high school, Sparks (2010) identified non-cognitive indicators that are crucial for student success in higher education and employment. Sparks' list of indicators included agreeableness (teamwork, emotional stability); extroversion; and openness to new experiences. Sparks suggested that a review of literature regarding student success isolates a student's conscientiousness (dependability, perseverance, and work ethic) as the biggest predictor of post-secondary success. These non-cognitive indicators parallel skills identified in the GLOBAL21 workplace readiness skill sets inherent in the current content standard objectives in career and technical education (West Virginia Department of Education, 2010_a).

In a 2010 study of secondary health care occupations students (Fastre, van der Klink, & van Merrienboer, 2010), one group was provided with a list of performance based criteria (step-by-step instructions) related to the application of knowledge in performance of tasks. A second group was provided with a list of competence based criteria describing what the students should be able to do. The performance based group outperformed the competence based group in task performance. The

competence based group reported more mental effort in completing tasks. The conclusion reached was that the performance based instruction was more efficient for the participants in the secondary study (Fastre et al., 2010).

State administrators and assessment specialists continue to participate in roundtables and conferences with counterparts from other states in an effort to include current and innovative research-based practices which maximize efficiency in performance based student assessment (West Virginia Department of Education, 2011). Several states are engaged in research related to the integral value of performance based assessment in career-focused curriculum, such as a recent Massachusetts study of secondary culinary arts students (D'Addario, 2011). The focus of the study was to determine whether secondary performance assessment experience influences post-secondary performance in knowledge and skills acquisition. Post-secondary culinary students completed a pre-test, demonstrated hands-on culinary tasks, and were evaluated on foundation knowledge for the occupational foods career area. The hypothesis presented pre-study was that the students from secondary vocational culinary preparation programs would perform above the level of the students who came to the culinary arts college from a traditional high school background.

Findings indicated that the students with the vocational background performed on a level approximating that of the students from a traditional background. In addition, researchers recommended that all students would benefit most from an emphasis on academics (general education subjects), and that articulation with post-secondary education, specifically, career-oriented post-secondary education be pursued by all secondary schools to support vocational and traditional students in transition. Although the Massachusetts study did not find that performance based

student assessment at the secondary level influenced the performance of those students in the post-secondary setting as compared to the traditional group, it was noted that, because of the numbers of at-risk students who tend to be enrolled in secondary vocational programs, the even performance seen at the post-secondary level may indicate that the secondary vocational assessment model did, indeed, have a positive influence on the vocational student's readiness for and capacity to perform comparably to any other students enrolled in the post-secondary culinary arts program (D'Addario, 2011).

Performance Based Student Assessment: Variables and Teacher Capacity

The dimensions of learning teaching model championed by Marzano, Pickering and McTighe (1993), identified five types of thinking as critical to success in education and in the workplace. That list included positive attitudes about learning, skills in acquiring new learning, skills in extending and refining knowledge, skills in using knowledge, and securing productive thinking habits. Teachers were offered resources to develop rubrics and learning activities which will afford students opportunities to apply prior and new knowledge, as well as solve problems using their refined thinking skills. In 1996, Ferrara and McTighe continued to argue performance based assessment as the best practice to use assessment and testing as a learning tool. This model continues to be adopted and adapted for the general education classroom as well as the career and technical education classroom. Almost a decade later, Wiggins and McTighe (2005) describe the usefulness of task oriented assessment and the need for teachers to dedicate much effort to supporting peer assessment in building capacity for students to function as peer evaluators and team workers in the workplace.

An advocate of the value of the portfolio as professional development, Xu (2004) urges educators and employers to include portfolios as an integral part of the evaluation process. Xu not only argues the worth of portfolio artifact and reflection to the employee and teacher in self-examination and self-improvement, but also sees the individual who has achieved portfolio building skills as potentially stronger as a supervisor or teacher who would then encourage and support others in the portfolio building process. Although some industrial workers, information technologists, hospitality workers and nurses may have exposure to portfolio building, reflective thinking and writing and self-evaluation, the exposure may have been in high school, and it is generally not an extensive foundation. With the requirement for inclusion of student portfolio building activities and resume preparation, teachers' prior personal experience with these skills could influence attitudes toward, and capacity to guide students in, the effective development of portfolios and resumes (West Virginia Department of Education, 2010_b).

Higher education reliance on employer feedback to tailor curriculum and delivery is mirrored by public school systems. West Virginia Department of Education career and technical education administrators have documented meetings with advisory committee members from business and industry seeking collaboration on curriculum design and instructional delivery models which reflect workplace situations and projects (West Virginia Department of Education, 2009_a). Professional development offerings regularly include project based learning for workplace preparation, and the use of projects to assess student knowledge and skills (West Virginia Department of Education, 2010_a).

Although a strong proponent of project based learning, Doppelt (2009) cautioned that such teaching models require teachers to contemplate their teaching

strategies, learning activities, and classroom organization. Studying high school students who completed project based learning activities and those who completed the same course without being required to complete project based assignments, Doppelt concluded that projects facilitated higher level thinking skills, stronger portfolio building, and constructive reflection. With this study came a recommendation that engineering and technical teachers employ performance on project work as an effective student assessment practice, and the suggestion that strong professional development and support would assist in teacher acceptance and comfort with a project based teaching model (Doppelt, 2009).

Conceptually, performance based student assessment practices provide formative opportunities for students to demonstrate mastery of learning objectives in all three domains of learning (cognitive, psychomotor, and affective) upon completion of a prescribed program of study (Shepard et al., 1995). Specifically, the 21st Century/GLOBAL21 workplace skill sets identified and included in the CTE Performance Based Assessment program piloted in 2009 in West Virginia include certain skill clusters: information and communication skills, thinking and problem solving skills and personal and workplace productivity skills (West Virginia Department of Education, 2009_b). Adding the job-specific knowledge and skills infused across the curriculum this provided a framework of four skill-set clusters upon which West Virginia career and technical students would be evaluated and which would serve as a foundation for the West Virginia GLOBAL21 Performance Based Assessment model for CTE (West Virginia Department of Education, 2010_a). These clusters encompass all three domains of learning.

Based on the requirements set forth by WVDE Policy 5202 (West Virginia Department of Education, 2010_c), all beginning teachers in West Virginia's technical,

industrial, and health occupations programs complete a prescribed program of study, consisting of twenty-one (21) credit hours of teacher preparation coursework, and subsequent teacher performance evaluations in the classroom. This prescribed program of seven courses includes an introductory teaching methods course, a follow-up practicum, and a course which focuses on methods of testing and measurement in career and technical education. The WVU Institute of Technology CTE teacher education faculty participated in discussions with administrators and expressed concern that, while the most recently updated syllabi in those courses introduced the concept of performance based formative CTE student assessment, the courses did not specifically address the state-adopted, summative, performance based CTE student assessment model (West Virginia Career and Technical Administrators, 2009).

The West Virginia career and technical education teacher licensure and certification requirements (West Virginia Department of Education, 2012) include minimum occupational work experience, which varies from field to field. For example, one of the engineering/technical/hospitality fields may require such experience as two or four years documented work experience in an industrial, business or public service job, while health science technology fields may require two or more years general nursing or allied health work experience as a licensed professional, or up to a bachelor's degree in nursing for a program coordinator's position. With this variety of work experience requirement comes variety of comfort levels in orienting or instructing peers and new employees on the job, as well as differing background experiences following training manuals or formal curriculum. When the worker transitions to the role of instructor in the school system, the expectation to orient and instruct students in the learning environment takes place immediately upon employment.

After the implementation of the West Virginia Student Performance Assessment pilot program in 2009, faculty delivering coursework through the West Virginia Institute of Technology Department of Career and Technical Education revised content in the methods of examination course to include a brief orientation to performance based student assessment as a formal concept. As the statewide implementation of the performance based student assessment model continued over the next two years, however, student feedback on end of course evaluations pointed to a need to increase exposure to performance based student assessment practices and tools earlier in the new career and technical education teachers' coursework so they would possess a higher comfort level and more expertise in preparing students for the assessment at the end of the first year, and subsequent years (West Virginia University Institute of Technology, $2010_{b,}$ West Virginia University Institute of Technology, 2010_{d}).

Inherent in curriculum and practicum required to complete registered nurse programs is a strong component related to patient and family education, ranging from pre-operative or pre-admission instructions and assessment of learning, to rehabilitation support, and capacity building of individuals of all ages. Care planning, collaborative goal-setting and evaluation of treatment parallel teaching strategies of lesson planning, educational goal-setting, and assessment of student learning. These characteristics are in the performance standards of the West Virginia Board of Examiners for Registered Nurses (2011). These common characteristics of the preparation programming for health science technology teachers differ from the disparate requirements for any similar content in engineering/technology/hospitality preparation in the background of those teachers entering the classroom from business and industry who may not have any prior exposure to teaching in any formal setting.

Rather, the typical engineering/technical/hospitality worker receives industrial training prior to or on-the-job, and often does not have an organized curriculum to follow.

CHAPTER THREE: METHODS

Introduction

The purpose of Chapter Three is to describe the methods employed in gathering and analyzing the data collected in this research. This chapter is organized around the following sections: research design, population and sample, instrument development and validation, data collection, and data analysis.

Research Design

This study was completed using a mixed methods, primarily quantitative research design. Dillman, Smyth, and Christian (2009) discussed the benefits of mixed methods survey design, citing the societal changes from the 1960s through the present, which influence response to survey research. Advocating mixed methods to offset any perceived lack of attention or bias based on communication skills or attitudes, they suggest the addition of a qualitative component to any quantitative survey provides respondents a platform to make their feelings about the research topic known, and ensures a perception of ownership in the study. This study also employed a paper, rather than an electronic, survey model.

Patton (2002) argues that a mixed methods model provides for clarity of purpose for the research study, limiting bias and articulating a willingness on the part of the researcher to analyze complex data and offer multi-dimensional findings and conclusions. The purposes of this study included a clear desire on the part of the researcher to contribute to the literature for purposes of training and professional development programming improvement for teachers and administrators. Additionally, because the data were collected from one group of subjects at one point in time, a cross-sectional survey approach was used (Fink, 2003).

In comparing benefits of paper surveys vs. electronic surveys, Dillman, Smyth and Christian (2009) concluded that response rates to paper surveys are generally higher than response rates to electronic surveys, especially among participants in older age groups, or those with a low comfort level with electronic processes such as computer based survey programs. They also believe that respondents share perspectives and information more readily if provided with some face-to-face contact and/or ability to connect the paper survey to a person or persons conducting the survey, as opposed to only connecting with an electronic message and being required to select or enter responses in an online survey format. These perspectives supported the decision to employ the paper survey instrument, as West Virginia CTE teachers traditionally enter the classroom from business and industry, with (until recent years) less than proficient computer and instructional technology skills (West Virginia University Institute of Technology, 2007).

Population and Sample

The population for this study included all West Virginia career and technical education (CTE) teachers in engineering, technical, hospitality, and health occupations program clusters. At the time of this study, WVDE reported 524 technical, industrial, and health occupations teachers in secondary and post-secondary programs serving students from all 55 counties in the state (West Virginia Department of Education, 2011). All subjects in the population were included in the sample.

Instrument Development and Validation

The survey instrument was a two-page, three-part, researcher-developed questionnaire (Appendix A). Part A requested demographic information about respondents. Part B requested respondents to use two five-point scales to indicate their level of knowledge about performance based student assessment practices and

their level of use of those practices. The third section, Part C, contained two open-ended questions requesting respondents to identify factors seen as supporting and as barriers to implementation of performance based student assessment in career and technical education classrooms and laboratories.

Part B consisted of a list of 20 performance based student assessment practices derived from the West Virginia GLOBAL21 Performance Based CTE Student Assessment model. Each performance based student assessment practice listed in Part B relates to one of the GLOBAL21 skill clusters (job-specific knowledge and skills, information and communication skills, thinking and problem solving skills, and personal and workplace productivity skills) (Appendix F). In addition, the selected list of practices includes those identified by Lynch (2000) and Backes (2009) as desirable assessment practices which contribute to student success in performance based skills assessment.

Fink (2003) recommends carrying out a pilot test or review of a survey instrument with a select group of potential respondents with knowledge of the topic area and, perhaps, with expertise in analyzing survey form and data. An expert panel of five individuals reviewed the survey instrument, *Performance Based Student Assessment In Career and Technical Education*. They were asked whether they thought the 20 performance based student assessment practices identified in Part B of the instrument accurately reflected student assessment strategies that would help prepare CTE students for the end-of-program performance based assessment. The group included two CTE teachers, one teacher educator, one administrator, and one state department specialist who had demonstrated knowledge of the performance based student assessment model by virtue of involvement in model development, previous extended training in performance based student assessment, and participation

in the pilot study and ensuing two years of implementation of performance based student assessment in West Virginia. No recommendations for instrument change came from the panel. Members of this panel are identified in Appendix B.

Data Collection

An electronic mail message requesting administrators' permission to distribute surveys (Appendix D) was sent to each county and building CTE administrator. The e-mail message asked for a reply within five work days from the date the electronic message was sent, indicating whether each administrator addressed granted permission to distribute surveys to teachers in a building or county. A list of administrators contacted, with notation of reply, was maintained by the researcher until completed surveys had been collected.

Survey questionnaires were distributed in those schools whose administrators replied to the e-mail in the affirmative. A letter of invitation to participate in the study (Appendix E), providing information regarding confidentiality and instructions for handling and return of completed survey questionnaires, was attached to each survey questionnaire distributed. Each paper survey questionnaire had a plain envelope attached to facilitate anonymous return. A sealed box was provided for deposit of completed surveys at a central collection site in the school. The collection box was identified only with the words Completed Surveys.

The survey instruments were distributed to teachers at participating schools by four regional teacher educators with the West Virginia University Institute of Technology Department of Career and Technical Education during regularly scheduled visits to each career and technical education facility. Teachers were asked to return completed (or blank) surveys within three weeks from the date of

distribution. The completed surveys were then picked up by the principal investigator or the co-principal investigator.

Data Analysis

Data collected to address Research Questions One and Two were analyzed by individual item, cluster, and total. Mean scores and standard deviations were calculated for each item, cluster, and the total, and a one-sample T-test was conducted to determine the level of significance with a $p<.05$. The sample means for each item, cluster, and the total score were compared to the means from hypothetical normal distributions for each item, cluster and the total.

To address Research Question Three, sample mean scores for knowledge and use for each item, cluster, and the total were calculated. A Pearson correlation between the level of knowledge and the level of use was then calculated for each item, cluster, and the total score. Strength of relationships indicated by correlation coefficients was categorized on a scale of none to perfect, using the values and categories identified by Holcomb (2006) as: 0.00 = no relationship, .01 - .24 = weak, .25 - .49 = moderate, .50 - .74 = moderately strong, .75 - .99 = very strong, and 1.00 = perfect.

Research Questions Four and Five were addressed by using emergent category analysis (Zhang & Wildemuth, 2009) to categorize responses by common themes. The use of emergent categories provided a second dimension of analysis to the original list of narrative responses by displaying the categories of factors identified as supports and barriers in terms of percentages, from those identified most often to those identified least often by respondents.

CHAPTER FOUR: PRESENTATION AND ANALYSIS OF FINDINGS

Introduction

The primary purpose of this study was to investigate the levels of knowledge and levels of use of performance based student assessment practices by career and technical education teachers in West Virginia. The study also sought to determine if there is a relationship between teacher level of knowledge and level of use of performance based student assessment practices. Finally, the study sought to identify factors perceived by teachers to be either supports or barriers to teacher implementation of performance based student assessment. Findings presented in this chapter are organized into the following sections: (a) data collection, (b) participant characteristics, (c) major findings for each of the five research questions investigated, (d) ancillary findings, and (e) a summary of the findings.

Data Collection

Upon approval by the Institutional Review Board (Appendix C), on November 16, 2011, 88 school and county career and technical education administrators in 52 career and technical education facilities statewide were sent an electronic (e-mail) request for permission to distribute two-page paper surveys to teachers in their counties and buildings (Appendix D). The request was sent to both county and facility administrators as some counties required that permission to survey in an individual facility be granted at the county rather than the facility level. Administrators were asked to respond to the e-mail within five school days indicating whether or not permission to survey was granted. Administrators, representing 48 of the 52 career and technical education facilities statewide, granted permission for distribution of the surveys in their facilities.

Upon notification of permission to survey teachers, blank survey forms were distributed to participating schools by West Virginia University Institute of Technology regional teacher education faculty between November 14, 2011 and December 16, 2011. The number of surveys provided to each facility was determined by using data from the West Virginia Department of Education website, and data on the number of CTE teachers provided by the 48 participating schools' administrators. Five hundred twenty-four surveys were distributed to participating schools.

A cover letter (Appendix E) explaining the purpose of the study was attached to each questionnaire. Collection of completed surveys began December 19, 2011, and was completed by January 5, 2012. Four hundred-fourteen surveys were returned, reflecting an overall response rate of 79%. Of the 414 surveys returned, 404 surveys were usable reflecting a usable response rate of 77.1%. Of the 404 usable surveys, 47% (n = 190) included narrative comments in response to the two open-ended items in Part C of the survey.

Characteristics of the Respondents

In Part A of the survey, participants were asked to respond to seven items which provided demographic or attribute information about respondents or the schools in which they taught. A summary of respondent characteristics is provided in Table 1.

More than three-fourths (77.7%) of the respondents reported they taught in engineering/technical/hospitality program areas and 21.8% (n = 88) indicated they taught in health science technology program areas. When asked to identify the program level at which they were teaching, 51% (n = 206) of the participating teachers reported they taught at the secondary level only, 9.8% (n = 39) taught at the

post-secondary level only, and 35.2% (n = 140) taught at both the secondary and post-secondary levels.

Participants were also asked to identify their total number of years of full-time teaching experience. Responding teachers reported the total years of full-time teaching experience as follows: 8.2% (n = 33) <1 year, 23.3% (n = 94) 1 – 5 years, 24.8% (n = 100) 6 - 10 years, and 43.8% (n = 177) 11 or more years.

Participants were also asked to identify the type of career and technical education facility in which they taught. No respondents indicated they currently taught in a job training/re-training facility and, for purposes of analysis, responses from teachers reporting they taught in an institutional educational facility were collapsed with responses from those teaching in a multi-county CTE facility. Participating teachers reported teaching in the following types of educational facilities: 24.4% (n = 98) in a comprehensive high school, 52.7% (n = 212) in a county career and technical education center or academy, and 22.9% (n = 92) in a multi-county career and technical education center (including institutional education centers).

When participants were asked whether they were required to take a performance based proficiency test in order to be credentialed in their career and technical teaching field, 67.3% (n = 272) reported they had been required to take a performance based proficiency test in order to be credentialed and 32.7% (n = 132) reported that they had not been required to do so. When asked whether they received training in performance based student assessment, almost nine of 10 (88.1%) respondents reported receiving training in performance based student assessment, while 11.9% (n = 48) reported they had not received any such training.

Table 1. *Demographic Characteristics of Participating CTE Teachers*

Characteristic	n	%
Program area taught		
Engineering/Technical/Hospitality	314	77.7
Health Science Technology	88	21.8
Grade level taught		
Secondary only	206	51.8
Post-secondary only	39	9.8
Secondary and Post-secondary	140	35.2
Teaching experience (years)		
< 1	33	8.2
1 – 5	94	23.3
6 – 10	100	24.8
11 or more	177	43.8
Type of school/facility		
Comprehensive high school	98	24.4
County career technical education center/academy	212	52.7
Multi-county career technical education center	92	22.9
Teacher took performance based assessment		
Yes	272	67.3
No	132	32.7
Teacher trained in performance based assessment		
Yes	356	88.1
No	48	11.9

N = 404

Participants were also asked to identify any source/type of training received relative to performance based student assessment, if, indeed, they had received such training. Of the 356 (88.1%) participants who reported they had received training in performance based student assessment, 203 (57%) reported participating in school-based in-service, 196 (55.1%) reported talking with fellow teachers, 178 (50%) reported participating in West Virginia University Institute of Technology coursework/workshops, 164 (46.1%) reported participating in WVDE in-service, 141 (39.6%) reported participating in county-based in-service, 123 (34.6%) reported using the Performance Based Test Manual, and 100 (28.1%) reported using the WVDE website. These data are presented in Table 2.

Table 2. *Respondent Training Related to Performance Based Student Assessment*

Sources of Training Received	n*	%
School-provided in-service	203	57.0
Talking with fellow teachers	196	55.1
WVU Tech coursework/workshops	178	50.0
WVDE (State Department) in-service	164	46.1
County-provided in-service	141	39.6
Performance Based Test Manual	123	34.6
WVDE (State Department) website	100	28.1

N = 404 * Duplicated Count

Major Findings

Major findings presented and discussed within this section are organized around the five research questions investigated during the study. A second section presents the findings from an ancillary analysis of differences in levels of knowledge and use based on selected independent variables. A third section provides data on the reliability of the survey instrument. A final section provides a chapter summary.

Research Question One: What is the West Virginia career and technical education teacher's level of knowledge about performance based student assessment practices?

Twenty performance based student assessment practices were listed in Part B of the survey. In the first of two columns, participating teachers were asked to use a scale of 1 – 5, with 1 = poor, 2 = fair, 3 = good, 4 = very good, and 5 = exceptional, to rate their perceived level of knowledge about each practice. A one-sample t-test, comparing the sample mean for each practice to the mean score (M = 3.0) from a hypothetical normal distribution, was conducted on each of the 20 practices.

The 20 practices were also grouped into four performance clusters based on West Virginia Department of Education GLOBAL21 skill sets (Appendix F). Total cluster scores for each subject were calculated by summing the responses to the five individual practices included in each cluster. A one-sample t-test, comparing each total sample cluster mean to the mean score (M = 15) from a hypothetical normal distribution, was conducted for each cluster.

Finally, a total level of knowledge score was calculated for each subject by summing the responses to each of the 20 practices. A one-sample t-test, comparing the sample total mean score to the mean score (M = 60) from a hypothetical normal distribution, was conducted.

An analysis of respondent mean scores for the 20 individual performance based assessment practices revealed three levels of response: four practices had mean scores less than 3.5. Mean scores for 11 practices fell between 3.5 and 3.99, and five practices had mean scores between 4.0 and 5.0. Those practices with mean knowledge level scores less than 3.5 included attitude assessment rubrics (M = 3.07, SD = 1.06), attitude checklists (M = 3.31, SD = .99), portfolio building (M = 3.32, SD = 1.05), and knowledge assessment rubrics (M = 3.49, SD = .98).

Those assessment practices with mean knowledge level scores between 3.5 and 3.99 included technical writing activities (M = 3.5, SD = .94), technical reading activities (M = 3.62, SD = .91), instructional technology activities (M = 3.65, SD = 1.08), interview skills exercises (M = 3.66, SD = .99), resume development (M = 3.69, SD = 1.02), skill assessment rubrics (M = 3.75, SD = .95), questioning strategies (M = 3.76, SD = .89), oral communication activities (M = 3.81, SD = .94), knowledge tests (M = 3.86, SD = .80), applied math activities (M = 3.87, SD = .93), and skills checklists (M = 3.88, SD = .94). Those assessment practices with mean knowledge level scores between 4.0 and 5.00 included critical thinking/problem solving (M = 4.00, SD = .87), job/workplace simulation/cases (M = 4.04, SD = .84), group work/team building (M = 4.11, SD = .87), project based learning activities (M = 4.14, SD = .89), and student use of machines/equipment (M = 4.29, SD = .85).

When compared to the mean score (M = 3.0) from a hypothetical normal distribution, one-sample t-test results indicated the difference in sample mean scores for all 20 practices were statistically significant at $p < .001$. Data for the 20 individual practices are presented in Table 3.

When responses were analyzed based on performance clusters, total cluster knowledge level means ranged from 17.93 to 19.26 (R = 5 – 25). From lowest to

highest, the mean scores for each cluster were: Cluster 2—Information and Communication Skills (M = 17.93, SD = 3.91), Cluster 4—Personal and Workplace Productivity Skills (M =18.65, SD = 3.31), Cluster 3—Thinking and Problem Solving Skills, (M = 18.90, SD = 3.61), and Cluster 1—Job-specific Knowledge and Skills, (M = 19.26, SD = 3.35). When each sample cluster mean was compared to the mean (M = 15) from a hypothetical normal distribution for each cluster, one-sample t-test results indicated the differences in each of the sample cluster means was significantly different at $p < .001$. Data for the performance based practice clusters are provided in Table 4.

The total sample level of knowledge mean score (M = 74.8, SD = 12.59, R = 20 - 100) was compared to the mean (M = 60) from a hypothetical normal distribution. One sample t-test results ($t(403) = 23.58$) revealed that the difference in the two means was statistically significant at $p < .001$.

Table 3. *Knowledge Levels of CTE Teachers Relative to Performance Based Student Assessment Practices*

	Knowledge Levels		
	M	*SD*	*t* value
Performance Based Assessment Practice			
1. Cognitive/Knowledge tests	3.86	.80	21.54***
2. Knowledge assessment rubrics	3.49	.98	9.93***
3. Psychomotor/Skill checklists	3.88	.94	18.82***
4. Skill assessment rubrics	3.75	.95	15.80***
5. Affective/Attitude checklists	3.31	.99	6.29***
6. Attitude assessment rubrics	3.07	1.06	1.36***
7. Instructional technology exercises	3.65	1.08	12.20***
8. Student use of machines/equipment	4.29	.85	30.43***
9. Questioning strategies	3.76	.89	17.27***
10. Critical thinking/Problem solving	4.00	.87	23.18***
11. Project based learning activities	4.14	.89	25.73***

*** $p < .001$ N = 404 Scale: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Exceptional

Table 3. *Knowledge Levels of CTE Teachers Relative to Performance Based Student Assessment Practices (continued)*

	Knowledge Levels		
	M	*SD*	*t* value
Performance Based Assessment Practice			
12. Job/Workplace simulations/cases	4.04	.84	24.79***
13. Portfolio building	3.32	1.05	6.09***
14. Resume development	3.69	1.02	13.52***
15. Interview skills exercises	3.66	.99	13.43***
16. Oral communication activities	3.81	.94	17.19***
17. Technical reading activities	3.62	.91	13.69***
18. Technical writing activities	3.50	.94	10.71***
19. Applied math activities	3.87	.93	18.78***
20. Group work/Team building	4.11	.87	25.74***

*** $p < .001$ N = 404 Scale: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Exceptional

Table 4. *Knowledge Levels of CTE Teachers Relative to GLOBAL21 Performance Based Student Assessment Practices Clusters*

	Cluster Knowledge		
	M	*SD*	*t* value
Performance Based Assessment Practice Cluster			
Cluster 1 Job-specific Knowledge and Skills Sum of Items 1, 2, 3, 4, 8 Column A	19.26	3.35	25.59***
Cluster 2 Information and Communication Skills Sum of Items 7, 13, 14, 16, 18 Column A	17.93	3.91	15.06***
Cluster 3 Thinking and Problem Solving Skills Sum of Items 9, 10, 15, 17, 19 Column A	18.90	3.61	21.73***
Cluster 4 Personal and Workplace Productivity Skills Sum of Items 5, 6, 11, 12, 20 Column A	18.65	3.31	22.20***

***$p < .001$ N = 404 Scale: 5 = Poor, 10 = Fair, 15 = Good, 20 = Very Good, 25 = Exceptional R = 5 – 25

Research Question Two: What is the West Virginia career and technical education teacher's level of use of performance based student assessment practices?

In the second column in Part B of the survey, participating teachers were asked to use a scale of 1 – 5, with 1 = seldom, 2 = sometimes, 3 = regularly, 4 = frequently, and 5 = very frequently, to rate their perceived level of use of each of the 20 performance based assessment practices. A one-sample t-test, comparing the sample mean for each practice to the mean score (M = 3.0) from a hypothetical normal distribution, was conducted on each of the 20 practices.

The 20 practices were also grouped into four performance clusters based on West Virginia Department of Education GLOBAL21 skill sets. The clusters were the same as the clusters described under Research Question 1. Total cluster scores for each subject were calculated by summing the responses to the five individual practices in each cluster. A one-sample t-test, comparing each total sample cluster mean to the mean score (M = 15) from a hypothetical normal distribution, was conducted for each cluster.

Finally, a total level of use score for each subject was calculated by summing the responses to each of the 20 practices. A one-sample t-test, comparing the sample total mean score to the mean score (M = 60) from the hypothetical normal distribution, was conducted.

An analysis of respondent mean scores for the 20 individual performance based assessment practices revealed three levels of response: Ten practices had mean scores less than 3.5. Mean scores for eight practices fell between 3.5 and 3.99, and two practices had mean scores between 4.0 and 5.0. Those practices with mean scores less than 3.5 included attitude assessment rubrics (M = 2.61, SD = 1.16), attitude checklists (M = 2.97, SD = 1.13), portfolio building (M = 3.06, SD =1.14),

knowledge assessment rubrics (M = 3.10, SD = 1.08), interview skills exercises (M = 3.24, SD = 1.09), technical writing activities (M = 3.25, SD = 1.02), applied math activities (M = 3.25, SD = 1.02), resume development (M = 3.29, SD = 1.11), technical reading activities (M = 3.46, SD = 1.02), and skill assessment rubrics (M = 3.47, SD = 1.15).

Those assessment practices with mean scores between 3.5 and 3.99 included instructional technology exercises (M = 3.57, SD = 1.17), skill checklists (M = 3.60, SD = 1.16), oral communication activities (M = 3.64, SD = 1.03), knowledge tests (M = 3.69, SD = .95), group work/team building (M = 3.69, SD = 1.00), questioning strategies (M = 3.75, SD = .95), job/workplace simulations/cases (M = 3.96, SD = .96), and critical thinking/problem solving (M = 3.97, SD = .87). The two assessment practices with mean scores between 4.0 and 5.0 included project based learning activities (M = 4.09, SD = .93) and student use of machines/equipment (M = 4.25, SD = .97).

When compared to the mean score (M = 3.0) from the hypothetical normal distribution, one-sample t-test results indicated the differences in sample and hypothetical distribution mean scores for all 20 practices were statistically significant at $p < .001$. Data for the 20 individual practices are presented in Table 5.

When responses were analyzed based on clusters, cluster means ranged from 16.79 to 18.10 (R = 5 – 25). From lowest to highest, the mean scores for each cluster were: Cluster 2—Information and Communication Skills (M = 16.79, SD = 3.93), Cluster 4—Personal and Workplace Productivity Skills (M =17.69, SD = 3.58), Cluster 1—Job-specific Knowledge and Skills (M = 18.09, SD = 3.58), and Cluster 3—Thinking and Problem Solving Skills (M =18.10, SD = 3.48). When each sample cluster mean was compared to the mean (M = 15) from the hypothetical normal

distribution, one-sample t-test results indicated each of the sample cluster means was significantly different from the hypothetical normal distribution mean score at $p < .001$. Data for the performance based practice clusters are provided in Table 6.

The total level of use mean score ($M = 70.67$, $SD = 12.28$, $R = 20 - 100$) was compared to the mean ($M = 60$) from a hypothetical normal distribution. One sample t-test results ($t(403) = 17.48$) revealed that the difference in the two means was statistically significant at $p < .001$.

Table 5. *Levels of Use of CTE Teachers Relative to Performance Based Student Assessment Practices*

	Level of Use		
	M	*SD*	*t* value
Performance Based Assessment Practice			
1. Cognitive/Knowledge tests	3.69	.95	14.48***
2. Knowledge assessment rubrics	3.10	1.08	1.85***
3. Psychomotor/Skill checklists	3.60	1.16	10.49***
4. Skill assessment rubrics	3.47	1.15	8.25***
5. Affective/Attitude checklists	2.97	1.13	-.57***
6. Attitude assessment rubrics	2.61	1.16	6.83***
7. Instructional technology exercises	3.57.	1.17	9.75***
8. Student use of machines/equipment	4.25	.97	25.87***
9. Questioning strategies	3.75	.95	15.89***
10. Critical thinking/Problem solving	3.97	.87	22.21***
11. Project based learning activities	4.09	.93	23.51***

*** $p < .001$ N = 404 Scale: 1 = Seldom, 2 = Sometimes, 3 = Regularly, 4 = Frequently, 5 = Very frequently

Table 5. *Levels of Use of CTE Teachers Relative to Performance Based Student Assessment Practices* *(continued)*

	Level of Use		
	M	*SD*	*t* value
Performance Based Assessment Practice			
12. Job/Workplace simulations/cases	3.96	.96	19.91***
13. Portfolio building	3.06	1.14	1.09***
14. Resume development	3.29	1.11	5.24***
15. Interview skills exercises	3.24	1.09	4.50***
16. Oral communication activities	3.64	1.03	12.47***
17. Technical reading activities	3.46	1.02	9.16***
18. Technical writing activities	3.25	1.02	4.84***
19. Applied math activities	3.25	1.02	13.90***
20. Group work/Team building	3.69	1.00	24.43***

*** $p < .001$ N = 404 Scale: 1 = Seldom, 2 = Sometimes, 3 = Regularly, 4 = Frequently, 5 = Very frequently

Table 6. *Level of Use of CTE Teachers Relative to GLOBAL21 Performance Based Student Assessment Practices Clusters*

	Cluster Use		
	M	*SD*	*t* value
Performance Based Assessment Practice Cluster			
Cluster 1 Job-specific Knowledge and Skills Sum of Items1, 2, 3, 4, 8 Column B*)*	18.09	3.58	17.36***
Cluster 2 Information and Communication Skills Sum of Items 7, 13, 14, 16, 18 Column B	16.79	3.93	9.15***
Cluster 3 Thinking and Problem Solving Skills Sum of Items 9, 10, 15, 17, 19 Column B	18.10	3.48	17.89***
Cluster 4 Personal and Workplace Productivity Skills Sum of Items 5, 6, 11, 12, 20 Column B	17.69	3.58	15.14***

***$p < .001$ N = 404 Scale: 5 = Seldom, 10 = Sometimes, 15 = Regularly, 20 = Frequently, 25 = Very frequently R = 5 – 25

Research Question Three: What relationships, if any, exist between the West Virginia career and technical education teacher's level of knowledge about performance based student assessment practices and their level of use of those practices?

Research question three was addressed using the findings for levels of knowledge and levels of use for 20 individual practices, each of the four skill clusters, and the total sample mean. A Pearson product-moment correlation coefficient was used to determine whether significant relationships existed between teacher level of knowledge and level of use for each of the 20 performance based student assessment practices, the four skill clusters, and the total mean scores for knowledge and use. Relationships were described on a scale of none to perfect using the categories (.00 = no relationship, .01 - .24 = weak, .25 - .49 = moderate, .50 - .74 = moderately strong, .75 - .99 = very strong, and 1.00 = perfect) identified by Holcomb (2006). Tables 7 through 10 include the results, organized and presented by skill cluster, for each assessment practice and Table 11 contains the Pearson r findings for the four clusters.

The correlations between the levels of knowledge and use for the five practices included in the job specific knowledge and skills cluster are included in Table 7. Correlation coefficients ranged from .517 for cognitive knowledge tests to .659 for knowledge assessment rubrics. The relationships between levels of knowledge and use for all five job-specific knowledge and skills practices were statistically significant ($p < .001$) and moderately strong.

The correlations between the levels of knowledge and use for the five practices included in the information/communication skills cluster are included in Table 8. Correlation coefficients ranged from .617 for resume development to .791 for instructional technology exercises. The relationships between levels of knowledge

and use for all five information/communication practices were statistically significant ($p < .001$) and moderately strong.

The correlations between the levels of knowledge and use for the five practices included in the thinking/problem solving skills cluster are included in Table 9. Correlation coefficients ranged from .615 for interview skills exercises to .740 for critical thinking/problem solving. The relationships between levels of knowledge and use for all five information/communication practices were statistically significant ($p < .001$) and moderately strong.

The correlations between the levels of knowledge and use for the five practices included in the personal and workplace productivity skills cluster are included in Table 10. Correlation coefficients ranged from .532 for workplace simulations/case studies to .693 for project based learning activities. The relationships between levels of knowledge and use for all five personal and workplace productivity skills practices were statistically significant ($p < .001$) and moderately strong.

The correlations between the levels of knowledge and use for the four clusters overall are included in Table 11. Correlation coefficients ranged from .637 for the job-specific knowledge and skills cluster to .729 for the critical thinking and problem solving cluster. The relationships between levels of knowledge and use for all four clusters were statistically significant ($p < .001$) and moderately strong.

The correlation coefficient between total level of knowledge ($M = 74.76$, $SD = 12.59$) and total level of use ($M = 70.67$, $SD = 12.28$) was .729. This relationship was statistically significant ($p < .001$) and moderately strong.

Table 7. *Pearson Product-Moment Correlations Between Levels of Knowledge and Use: Job Specific Knowledge and Skills Assessment Practices*

Assessment Practice	1	2	3	4	8
1. Cognitive/Knowledge tests	.517***				
2. Knowledge assessment rubrics		.659***			
3. Psychomotor/Skill checklists			.646***		
4. Skill assessment rubrics				.656***	
8. Student use of machines/equipment					.635***

*** $p < .001$ N = 404

Table 8. *Pearson Product-Moment Correlations Between Levels of Knowledge and Use: Information/Communication Skills Assessment Practices*

Assessment Practice	7	13	14	16	18
7. Instructional technology exercises	.791***				
13. Portfolio building		.654***			
14. Resume development			.617***		
16. Oral communication activities				.694***	
18. Technical writing activities					.625***

*** $p < .001$ N = 404

Table 9. *Pearson Product-Moment Correlations Between Levels of Knowledge and Use: Thinking and Problem Solving Skills Assessment Practices*

Assessment Practice	9	10	15	17	19
9. Questioning strategies	.721***				
10. Critical thinking/Problem solving		.740***			
15. Interview skills exercises			.615***		
17. Technical reading activities				.621***	
19. Applied math activities					.632***

*** $p < .001$ N = 404

Table 10. *Pearson Product-Moment Correlations Between Levels of Knowledge and Use: Personal and Workplace Productivity Skills Assessment Practices*

Assessment Practice	5	6	11	12	20
5. Affectve/Attitude checklists	.638***				
6. Attitude assessment rubrics		.644***			
11. Project based learning activities			.693***		
12. Job/Workplace simulations/case studies				.532***	
20. Group work/Team building					.691***

*** $p < .001$ N = 404

Table 11. *Pearson Product-Moment Correlations Between Levels of Knowledge and Use: Assessment Practices Clusters*

Assessment Practices Cluster	1	2	3	4
1. Job specific knowledge and skills	.637***			
2. Information and communication skills		.728***		
3. Critical thinking and problem solving skills			729***	
4. Personal and workplace productivity skills				.686***

*** $p < .001$ N = 404

Research Question Four: What factors, if any, do West Virginia career and technical education teachers identify as supports to their efforts to implement performance based student assessment?

In Part C, Item 1 of the survey, participants were asked to respond to the open-ended question, What factors, if any, do you perceive as serving as supports to your efforts to implement performance based student assessment practices? Some respondents identified more than one factor (duplicated count). These data are presented in Table 12 and all original individual responses to this question are provided in Appendix G.

One-hundred-ninety comments were received regarding factors supporting teacher efforts to implement performance based student assessment. Emergent category analysis was used to analyze and categorize these responses (Zhang & Wildemuth, 2009). The most frequently reported factors were: career and technical education curriculum characteristics (31.1% , n = 59), administrative and teacher support (27.9%, n = 53), resources and time (11.1%, n = 21), assessment model characteristics/student-related factors (8.9%, n = 17), training (8.4%, n = 16), industry/community support (8.4%, n = 16), and instructional technology (6.8%, n = 13).

Research Question Five: What factors do West Virginia career and technical education teachers identify as barriers to their efforts to implement performance based student assessment?

In Part C, Item 2 of the survey, participants were asked to respond to the open-ended question, What factors, if any, do you perceive as serving as barriers to your efforts to implement performance based student assessment practices? Some respondents identified more than one factor (duplicated count). These data are presented in Table 13 and all original individual responses to this question are provided in Appendix H.

Two-hundred-thirty comments were received regarding factors identified as barriers to teacher efforts to implement performance based student assessment. As with the responses to Research Question Four, emergent category analysis was used to organize these comments into categories. The most frequently reported factors were: time/scheduling (26.1%, n = 60), funding/resources/infrastructure/technology (18.7%, n = 43), administrative/teacher support (18.3%, n = 42), industry/community support (15.2%, n = 35), student characteristics/abilities/learning styles (14.3%, n = 33), and performance based assessment model characteristics (7.4%, n = 17).

Table 12. *Factors Perceived as Supports to Implementation of Performance Based Student Assessment Practices as Reported in Part C, Item 1 Responses*

Support related to:	*n	%
Career and technical education curriculum/characteristics	59	31.1
Administrative/Teacher support	53	27.9
Resources/Time	21	11.1
Assessment model characteristics/Student-related factors	17	8.9
Training	16	8.4
Industry/Community support	13	6.8
Instructional technology	11	5.8

N = 404 *Duplicated count

Table 13. *Factors Perceived as Barriers to Implementation of Performance Based Student Assessment Practices as Reported in Part C, Item 2 Responses*

Barrier related to:	*n	%
Time/Scheduling/School calendar	60	26.1
Funding/Resources/Infrastructure/Technology	43	18.7
Administrative/Teacher support/training	42	18.3
Industry/Community support	35	15.2
Student characteristics/abilities/learning styles	33	14.3
Performance based assessment model characteristics	17	7.4

N = 404 *Duplicated count

Ancillary Findings

This study also investigated the differences in levels of teacher knowledge and use of performance based student assessment practices based on program area, whether or not a performance assessment was required for CTE teaching certification, participation in training to implement performance based student assessment practices, the type of school/facility in which the teachers taught, and total years of teaching experience. Independent samples t-tests and one-way analysis of variance (ANOVA) were used to determine if any significant differences existed. These findings, organized by independent variable, are presented and discussed in the following sections.

Program Area Taught

An independent samples t-test was conducted to compare levels of knowledge and use of the practices by cluster and totals by program area taught. Significant differences were found for levels of use for job-specific knowledge and skills between engineering/technical/hospitality areas (M = 17.83, SD = 3.51) and health science technology areas (M = 19.15, SD = 3.54), $t(400) = -3.096$. These differences were significant at $p < .01$. No other skill cluster or total resulted in significant differences in knowledge and use levels based on program area. The data are provided in Table 14.

Teacher Performance Assessment

An independent samples t-test was conducted to compare levels of knowledge and use of the practices by cluster and totals based on whether or not the participant had taken a performance based assessment as part of the requirements for teaching certification. Significant differences were found for levels of knowledge for respondents required to take a performance assessment (M = 17.65, SD = 3.80), and

those that had not been required to take a performance assessment (M = 18.52, SD = 4.10), $t(400) = -2.090$, for the information and communication skills cluster. These differences were significant at $p < .05$. No other significant differences in knowledge level based on teacher performance assessment resulted.

Significant differences based on whether or not a teacher had taken a performance based assessment as part of a teacher certification requirement were found for levels of use for two skill clusters. For job-specific knowledge and skills, significant differences ($p < .01$) were found between respondents required to take a performance assessment (M = 18.42, SD = 3.39), and those that had not been required to take a performance assessment (M = 17.42, SD = 3.87), $t(400) = 2.638$. For personal and workplace productivity skills, significant differences were found between those who reported being required to take a performance assessment (M = 18.15, SD = 3.49) and those who responded that had not been required to take a performance assessment (M = 16.75, SD = 3.58), $t(400) = 3.753$. These differences were significant at $p < .001$. There were no other significant differences in use level based on whether or not a teacher performance assessment had been completed as part of the requirements for certification. The data are provided in Table 15.

Teacher Training

An independent samples t-test was conducted to compare levels of knowledge and use of the practices by cluster and totals based on whether or not the respondent had participated in training in performance based student assessment. Significant differences were found for three of four knowledge clusters and in the knowledge total. These data are presented in Table 16.

For the job-specific knowledge and skills cluster, significant differences were found in knowledge levels between respondents who participated in training (M =

19.50, SD = 3.25) and those that had not participated in training (M = 17.48, SD = 3.57), $t(400) = 4.004$. These differences were significant at $p < .001$. For personal and workplace productivity skills, significant differences were found between respondents who participated in training (M = 18.85, SD = 3.27) and those that had not participated in training (M = 17.21, SD = 3.27), $t(400) = 3.260$. These differences were significant at $p < .001$. For thinking and problem solving skills, significant differences were found between respondents who participated in training (M = 19.06, SD 3.58) and those that had not participated in training (M = 17.73, SD = 3.63), $t(400) = 2.415$. These differences were significant at $p < .05$. For total knowledge level, significant differences were found between respondents who participated in training (M = 75.41, SD = 12.48) and those that had not participated in training (M = 69.96, SD = 12.48), $t(400) = 2.843$. These differences were significant at $p < .01$.

Significant differences between use levels of performance based practices based on whether or not teachers had participated in training on performance based assessment were found for all four use clusters and in the total level of use score. These data are presented in Table 16.

For job-specific knowledge and skills, significant differences in levels of use ($p < .01$) were found between respondents who participated in training (M = 18.32, SD = 3.38) and those that had not participated in training (M = 16.40, SD = 4.52), $t(400) = 2.847$. For personal and workplace productivity skills, significant differences were found between respondents who participated in training (M = 17.95, SD = 3.54) and those that had not participated in training (M = 15.81, SD = 3.31), $t(400) = 3.952$. These differences were significant at $p < .001$. For thinking and problem solving skills, significant differences were found between respondents who participated in training (M = 18.30, SD 3.40) and those that had not participated in training (M =

16.63, SD = 3.80), $t(400) = 3.158$. These differences were significant at $p < .01$. For information and communication skills, significant differences were found between respondents who participated in training (M = 16.99, SD = 3.90) and respondents who had not participated in training (M = 15.33, SD = 3.97), t(400) = 2.756. These differences were significant at $p < .01$. For total use level, significant differences were found between respondents who participated in training (M = 71.55, SD = 11.92) and those that had not participated in training (M = 64.17, SD = 13.01), t(400) = 3.983. These differences were significant at $p < .001$. The data are provided in Table 16.

Teaching Experience

A one-way analysis of variance (ANOVA) was used to determine if there were significant differences in knowledge and use levels for clusters and total, based on participants' years of teaching experience. These data are presented in Table 17. Significant differences ($p < .001$) were found for all knowledge clusters and the totals based on participants' years of teaching experience. Generally, the more years teaching experience reported, the higher the level of knowledge scores for each cluster and total scores. Significant differences in total knowledge levels based on years of teaching experience were also found.

Significant differences ($p < .05$) were found for all use clusters and the totals based on participants' years of teaching experience. Generally, the more years teaching experience reported, the higher the level of use scores for each cluster and total scores. Significant differences were also found in total use levels based on years of teaching experience.

Type of Facility

A one-way way analysis of variance (ANOVA) was used to determine if significant differences existed in levels of knowledge and use of the practices by clusters and totals based on the type of facility in which the participant taught. A significant difference in knowledge levels based on facility type was found for information and communication skills: comprehensive high school ($M = 17.46$, $SD = 3.56$), county center ($M = 18.43$, $SD = 4.00$), multi-county center ($M = 17.32$, $SD = 3.55$) $F = 3.64$ ($p < .05$). No significant differences based on facility type were found for any other knowledge or use level cluster or total score. These data are provided in Table 18.

Table 14. *Mean Differences between Levels of Knowledge and Use by Cluster and Total for Program Area Taught*

Clusters/Totals	Engineering/Technical/Hospitality M	SD	Health Science Technology M	SD	*t*(400)
Knowledge Level					
1. Job-specific Knowledge and Skills	19.13	3.41	19.81	3.09	-1.686
2. Information and Communication Skills	17.89	3.94	18.09	3.89	-.434
3. Thinking and Problem Solving Skills	18.88	3.60	18.99	3.72	-.251
4. Personal and Workplace Productivity Skills	18.70	3.34	18.50	3.23	-.502
Total Knowledge Level	74.61	12.70	75.39	12.33	-.509
Use Level					
1. Job-specific Knowledge and Skills	17.83	3.51	19.15	3.54	-3.096**
2. Information and Communication Skills	16.63	3.95	17.40	3.83	-1.620
3. Thinking and Problem Solving Skills	18.03	3.48	18.33	3.53	-.707
4. Personal and Workplace Productivity Skills	17.78	3.54	17.43	3.74	-.799
Total Use Level	70.27	12.08	72.31	12.86	-1.380

**$p < .01$. n = 314 (Engineering/Technical/Hospitality), n = 88 (Health Science Technology)

Table 15. *Mean Differences between Levels of Knowledge and Use by Cluster and Total by Whether or Not Performance Assessment Taken for Teacher Certification*

Clusters/Totals	Required M	Required SD	Not Required M	Not Required SD	*t*(400)
Knowledge Level					
1. Job-specific Knowledge and Skills	19.38	3.23	19.02	3.58	1.034
2. Information and Communication Skills	17.65	3.80	18.52	4.10	-2.090*
3. Thinking and Problem Solving Skills	18.93	3.52	18.85	3.80	.213
4. Personal and Workplace Productivity Skills	18.76	3.12	18.43	3.66	.879
Total Knowledge Level	74.74	12.02	74.81	13.73	-.051
Use Level					
1. Job-specific Knowledge and Skills	18.42	3.39	17.42	3.87	2.638**
2. Information and Communication Skills	16.61	3.85	17.17	4.02	-1.333
3. Thinking and Problem Solving Skills	18.29	3.46	17.71	3.52	1.558
4. Personal and Workplace Productivity Skills	18.15	3.49	16.75	3.58	3.753***
Total Use Level	71.46	12.19	69.05	12.34	1.854

*$p < .05$ **$p < .01$ ***$p < .001$ n = 272 (Required to take performance assessment), n = 132 (Not required to take performance assessment)

Table 16. *Mean Differences between Levels of Knowledge and Use by Cluster and Total by Whether or Not Teachers Participated in Training on Performance Assessment*

Clusters/Totals	Participated in training M	Participated in training SD	Did not participate M	Did not participate SD	*t*(400)
Knowledge Level					
1. Job-specific Knowledge and Skills	19.50	3.25	17.48	3.57	4.004***
2. Information and Communication Skills	17.99	3.88	17.54	4.17	.738
3. Thinking and Problem Solving Skills	19.06	3.58	17.73	3.63	2.415*
4. Personal and Workplace Productivity Skills	18.85	3.27	17.21	3.27	3.260***
Total Knowledge Level	75.41	12.48	69.96	12.48	2.843**
Use Level					
1. Job-specific Knowledge and Skills	18.32	3.38	16.40	4.52	2.847**
2. Information and Communication Skills	16.99	3.90	15.33	3.97	2.756**
3. Thinking and Problem Solving Skills	18.30	3.40	16.63	3.80	3.158**
4. Personal and Workplace Productivity Skills	17.95	3.54	15.81	3.31	3.952***
Total Clusters Use Level	71.55	11.92	64.17	13.01	3.983***

*$p < .05$ **$p < .01$ ***$p < .001$ n = 356 (Participated in training), n = 48 (Did not participate in training)

Table 17. *Means, Standard Deviations, and One-Way Analysis of Variance for Levels of Knowledge and Use by Cluster and Total for Years of Teaching Experience*

	< 1		1 – 5		6 – 10		> 11		
Clusters/Totals	M	SD	M	SD	M	SD	M	SD	F
Knowledge Level									
1. Job-specific Knowledge and Skills	16.76	3.99	18.94	2.88	19.68	2.86	19.67	3.51	8.26***
2. Information and Communication Skills	15.48	4.56	16.97	3.44	17.73	3.82	19.02	3.74	11.68***
3. Thinking and Problem Solving Skills	16.15	4.35	18.53	2.97	18.51	3.40	19.84	3.58	11.96***
4. Personal and Workplace Productivity Skills	16.48	3.87	18.29	2.61	18.74	3.15	19.20	3.44	7.05***
Total Knowledge Level	64.88	14.98	72.72	10.20	74.66	11.98	77.75	12.52	11.82***
Use Level									
1. Job-specific Knowledge and Skills	15.79	4.83	18.04	3.12	18.28	3.17	18.45	3.63	5.40***
2. Information and Communication Skills	13.76	3.58	16.19	3.48	16.35	3.93	17.93	3.85	13.77***
3. Thinking and Problem Solving Skills	15.52	4.12	17.85	2.88	17.52	3.10	19.04	3.54	12.41***
4. Personal and Workplace Productivity Skills	16.21	4.06	17.46	2.81	17.48	3.56	18.21	3.77	3.46*
Total Use Level	61.27	14.55	69.54	9.95	69.63	11.51	73.62	12.38	11.13***

* $p < .05$ ***$p < .001$ n = 33 (<1), n = 94 (1 - 5), n = 100 (6 – 10), n = 177 (>11)

Table 18. *Means, Standard Deviations, and One-Way Analysis of Variance for Levels of Knowledge and Use by Cluster and Total for Type of Facility*

	Comprehensive HS		County Center		Multi-County Center		
Clusters/Totals	M	SD	M	SD	M	SD	F
Knowledge Level							
1. Job-specific Knowledge and Skills	19.52	3.14	19.35	3.26	18.79	3.73	1.31
2. Information and Communication Skills	17.46	3.56	18.43	4.00	17.32	3.99	3.64*
3. Thinking and Problem Solving Skills	18.70	3.22	19.21	3.63	18.43	3.90	1.71
4. Personal and Workplace Productivity Skills	18.47	2.83	18.94	3.50	18.20	3.26	1.86
Total Knowledge Level	74.21	10.80	75.94	12.78	72.73	13.67	2.24
Use Level							
1. Job-specific Knowledge and Skills	18.43	3.14	18.27	3.82	17.29	3.38	3.00
2. Information and Communication Skills	16.42	3.38	17.10	4.18	16.47	3.93	1.40
3. Thinking and Problem Solving Skills	17.84	3.34	18.42	3.53	17.65	3.50	1.92
4. Personal and Workplace Productivity Skills	17.52	3.16	18.02	3.79	17.10	3.44	2.31
Total Use Level	70.18	10.85	71.81	13.13	68.51	11.50	2.42

*$p < .05$ n = 98 (Comprehensive high school), n = 212 (County center), n = 92 (Multi-county center)

Instrument Reliability

The internal consistency of the *Performance Based Student Assessment in Career and Technical Education* survey instrument, Part 2, was tested using Cronbach's alpha coefficient. The alpha coefficients for the levels of knowledge and use for each of the four skill clusters and the total levels of knowledge and use were calculated. Reliability of the instrument was described according to the levels of acceptability found in Pallant's (2007) guide to analysis. These data are provided in Table 19.

The internal consistency (r) for the level of knowledge for the four clusters ranged from a high of .843 (M = 18.92, SD 3.60) for thinking and problem solving skills to a low of .746 (M = 18.67, SD = 3.29) for personal and workplace productivity skills. The internal consistency for the total 20 knowledge items was .935 (M = 74.79, SD = 2.59). These alpha coefficients indicate an acceptable level (above .7) for two of the clusters (job-specific knowledge and skills and personal and workplace productivity skills), and a desirable level of reliability (above .8) for the other two clusters (information and communication skills and thinking and problem solving skills). The internal consistency for the knowledge total suggests a desirable level of reliability (above .8) overall for the knowledge scale.

The internal consistency for the level of use for the four clusters ranged from a high of .766 (M = 16.80, SD = 3.94) for information and communication skills to a low of .693 (M = 18.12, SD = 3.55) for job specific knowledge and skills. The internal consistency for the total 20 use items was .901 (M = 70.72, SD = 12.27). These alpha coefficients indicate an acceptable level of reliability (above .7) for three of the clusters (information and communication skills, thinking and problem solving skills, and personal and workplace productivity skills). The internal consistency for

the use total suggests a desirable level of reliability (above .8) overall for the use scales.

Table 19. *Cronbach's Alpha Coefficient for Instrument Reliability: Performance Based Student Assessment in Career and Technical Education*

		Internal Consistency		
Clusters/ Totals	n scale items	M	SD	Alpha Coefficient
Knowledge Level				
1. Job-specific Knowledge and Skills	5	19.26	3.35	.790
2. Information and Communication Skills	5	17.96	3.89	.831
3. Thinking and Problem Solving Skills	5	18.92	3.60	.843
4. Personal and Workplace Productivity Skills	5	18.67	3.29	.746
Total Knowledge Level	20	74.79	12.59	.935
Use Level				
1. Job-specific Knowledge and Skills	5	18.12	3.55	.693
2. Information and Communication Skills	5	16.80	3.94	.766
3. Thinking and Problem Solving Skills	5	18.10	3.49	.750
4. Personal and Workplace Productivity Skills	5	17.70	3.57	.740
Total Use Level	20	70.72	12.27	.901

Summary of Findings

The purpose of this chapter was to present data gathered for a study examining the levels of knowledge and levels of use of performance based student assessment practices among teachers in engineering, technical, hospitality and health occupations programs in West Virginia career and technical education facilities. Respondents were asked to rate their levels of knowledge and use of 20 performance based student assessment practices and identify factors which supported or served as barriers to the implementation of performance based student assessment.

In general, WV CTE teachers described their level of knowledge regarding the 20 performance based student assessment practices as good or very good. When asked to describe their frequency of use of those same practices, teachers most often indicated they used them on a regular basis. These same patterns were evident when both knowledge and use responses were analyzed by cluster and totals. Correlation coefficients indicated the relationships between knowledge and use levels for individual practices, clusters, and total scores were moderately strong (Holcomb, 2006).

When asked to identify factors which support the implementation of performance based student assessment practices, teachers pointed most often to CTE curriculum characteristics and administrative and teacher support, with other contributing support factors noted to include resources and time, assessment model characteristics, student-related factors, training, and industry and community support. Factors most often identified as barriers to the implementation of performance based student assessment practices included those related to time, scheduling and school calendar, funding, resources, infrastructure and technology, administrative support,

industry and community support, student characteristics, and performance based assessment model characteristics.

Ancillary findings indicate significant differences in levels of knowledge and use based on whether or not the teacher had participated in training related to performance based assessment. Those teachers who participated in training related to performance based assessment reported higher level of knowledge scores for three of four knowledge clusters (job-specific knowledge and skills, personal and workplace productivity, and thinking and problem solving) and in the knowledge total than those who did not participate in such training. Similarly, those teachers who had participated in training related to performance based assessment reported higher levels of use scores for all four use clusters and in the use total than teachers who had not participated in such training.

Significant differences were also found for all knowledge clusters and the totals based on participants' years of teaching experience. Generally, the more years teaching experience reported, the higher the level of knowledge scores and level of use scores, for each cluster and total score. No consistent differences in levels of knowledge and use were found based on program area, whether a teacher had been required to complete a performance assessment for licensure, or the type of facility in which they taught.

Cronbach's alpha results indicate a desirable level of reliability overall for knowledge and use clusters for the survey instrument. Coefficients indicate an acceptable level (above .7) for two clusters (job-specific knowledge and skills and personal and workplace productivity skills), and a desirable level of reliability (above .8) for the other two clusters (information and communication skills and thinking and problem solving skills), and a desirable level of reliability (above .8) for the total

knowledge scale. Coefficients indicate an acceptable level (above .7) for three of the clusters (information and communication skills, thinking and problem solving skills, and personal and workplace productivity skills), and a desirable level of reliability (above .8) for the total use scale.

CHAPTER FIVE: CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Introduction

This chapter reviews the purpose of the study, methods, and the demographic data. A summary of the study findings is presented. This chapter ends with a presentation of study conclusions, a discussion and implications section, and recommendations for further research.

Purpose of the Study

The purpose of this study was to investigate and describe the levels of knowledge and the levels of use of performance based student assessment practices by engineering, technical, hospitality, and health science technology teachers in career and technical education programs in West Virginia's public schools. In addition, this study sought to determine what relationships, if any, existed between levels of knowledge and levels of use of performance based student assessment practices. Finally, this study sought to identify factors which teachers perceived as supports or barriers to their implementation of performance based student assessment. The following research questions guided the study:

1. What is the West Virginia career and technical education teacher's level of knowledge about performance based student assessment practices?
2. What is the West Virginia career and technical education teacher's level of use of performance based student assessment practices?
3. What relationships, if any, exist between the West Virginia career and technical education teacher's level of knowledge about performance based student assessment practices and their level of use of those practices?

4. What factors, if any, do West Virginia career and technical education teachers identify as supports to their efforts to implement performance based student assessment?
5. What factors, if any, do West Virginia career and technical education teachers identify as barriers to their efforts to implement performance based student assessment?

Population

The population for this study included all West Virginia career and technical education (CTE) teachers in engineering, technical, hospitality and health occupations program clusters. At the time of this study, the WVDE reported 524 engineering, technical, hospitality, and health occupations teachers in secondary and post-secondary programs serving students from all 55 counties in the state (West Virginia Department of Education, 2011). All subjects in the population were included in the sample.

Methods

This study was completed using a mixed methods, primarily quantitative research design. The data were collected from one group of subjects at one point in time, using a cross-sectional survey model.

The survey instrument was a two-page, researcher-developed questionnaire, *Performance Based Student Assessment in Career and Technical Education*, which consisted of three parts. Part A requested demographic information about respondents. Part B requested respondents to use two five-point scales to indicate their level of knowledge about and their level of use of a list of 20 performance based student assessment practices. The third section, Part C, contained two open-ended questions requesting respondents to identify factors seen as supporting/facilitating or

as barriers to implementation of performance based student assessment in the career and technical education classroom and laboratory. An expert panel of career and technical education teachers and administrators validated the instrument.

Survey instruments were distributed to teachers in 48 facilities where administrators granted permission to do so. Completed questionnaires were collected by the principal investigator and the co-principal investigator. Survey responses were received from 414 career and technical education teachers.

Data collected to address RQ1 and RQ2 were analyzed by individual item and total. Mean scores were calculated for each item, cluster, and the total and one-sample T-tests were conducted to determine the level of significance with a $p<.05$. To address RQ3, a Pearson correlation between the level of knowledge and the level of use was calculated for each item, cluster, and the total score. RQ4 and RQ5 findings were analyzed by Emergent Category Analysis.

Summary of Findings

In general, West Virginia's CTE teachers described their level of knowledge regarding the 20 performance based student assessment practices, by individual practice, skill cluster, and total, as good or very good and indicated they used those practices on a regular basis. Relationships between knowledge and use levels for individual practices, clusters, and total scores were moderately strong.

Factors related to career and technical education curriculum characteristics, and administrative and teacher support were most often identified as supports to the implementation of performance based student assessment. The other most frequently noted support factors included resources and time, assessment model characteristics, student-related factors, training, and industry and community support. Factors related to time, scheduling and school calendar, funding, resources, infrastructure and

technology, administrative support, industry and community support, student characteristics, and performance based assessment model characteristics were most often identified as barriers to the implementation of performance based student assessment.

There were significant differences in levels of knowledge and use based on whether or not the teacher had participated in training related to performance based assessment and total years of teaching experience. In general, teachers with more years of teaching experience and who had participated in training related to performance based student assessment practices reported the highest levels of knowledge and use scores. No statistically significant differences were found in knowledge and use levels based on program area, whether a teacher had been required to complete a performance based assessment for licensure, or type of facility in which the individual taught. The survey instrument exhibited an overall desirable level of reliability.

Conclusions

Data collected as a part of this study were sufficient to support the following conclusions

Research Question One: What is the West Virginia career and technical education teacher's level of knowledge about performance based student assessment practices?

Overall, West Virginia's career and technical education teachers reported a good to very good level of knowledge regarding performance based student assessment practices. This level of knowledge was consistent across the 20 individual assessment practices, the four skills clusters, and the total knowledge level.

Research Question Two: What is the West Virginia career and technical education teacher's level of use of performance based student assessment practices?

Overall, West Virginia's career and technical education teachers reported a regular or frequent level of use of performance based student assessment practices. This level of use was generally consistent across the 20 individual assessment practices, three of the four skills clusters, and the total use level.

Research Question Three: What relationships, if any, exist between the West Virginia career and technical education teacher's level of knowledge about performance based student assessment practices and their level of use of those practices?

Overall, the relationship between levels of knowledge about and use of performance based student assessment practices was moderately strong. This result was consistent for the relationship between levels of knowledge and use for individual practices, clusters, and totals.

Research Question Four: What factors, if any, do West Virginia career and technical education teachers identify as supports to their efforts to implement performance based student assessment?

Factors most often identified by West Virginia's career and technical education teachers as supporting the implementation of performance based student assessment were related to career and technical education curriculum characteristics and administrative/teacher support. Less frequently noted factors related to resources and time, assessment model characteristics, student-related factors, training, and industry/community support.

Research Question Five: What factors, if any, do West Virginia career and technical education teachers identify as barriers to their efforts to implement performance based student assessment?

Factors most often identified by West Virginia's career and technical education teachers as barriers to the implementation of performance based student

assessment were related to time/scheduling/school calendar, funding/resources, infrastructure/technology, administrative/teacher support, industry/community support and student characteristics. Characteristics of the performance based assessment model were also noted as a barrier to effective implementation of performance based student assessment practices.

Conclusions from Ancillary Research Findings

No significant differences were found in levels of knowledge about and use of performance based student assessment practices based on the program area taught, whether or not the teacher was required to complete a performance based assessment for employment, or type of facility in which the respondent taught. Statistically significant differences were found in levels of knowledge about and use of performance based student assessment practices based on teacher participation in training related to performance based student assessment and years of teaching experience. Those teachers who participated in training related to performance based assessment reported higher level of knowledge scores for three of four knowledge clusters (job-specific knowledge and skills, personal and workplace productivity, and thinking and problem solving), and in total knowledge level, than those who had not participated in such training. Similarly, those teachers who had participated in training related to performance based assessment reported higher levels of use scores for all four use clusters and in total use than those teachers who had not participated in such training. Generally, the more years teaching experience reported, the higher the level of knowledge and level of use scores for each cluster and the total knowledge and use scores.

Discussion and Implications

The study findings provide a foundation upon which the West Virginia performance based student assessment model may be evaluated, administrator and teacher preparation curricula made more relevant to career and technical education student needs, formative and summative student assessment developed with a greater applicability to the workplace, and professional support structures designed to increase teacher efficacy and efficiency with performance based student assessment practices. The overall response rate (79%) and the themes which emerged from the open-ended survey items imply a substantial level of interest in the topic and a spirit of cooperation from district and local administrators and teachers statewide.

The consolidation of the limited number of surveys received from respondents in institutional education facilities into the multi-county facility group may have influenced the data from the multi-county group negatively with respect to the level of use of individual performance based student assessment practices. Institutional education facilities in West Virginia have restrictions on web-based activities, infrastructure limitations, and risk-management issues that are different from the typical public school. Teachers and students in the institutional programs have limited access to internet, restricted communication and travel off-campus and, generally, are limited in hands-on application of knowledge related to large and small equipment because of legal constraints of the institutional environment (West Virginia University Institute of Technology, 2007, 2010_b).

The positive respondent comments regarding WVDE and administrator support for teachers in integrating performance based assessment notwithstanding, the comments regarding barriers to such program integration indicate a need for continued periodic program evaluation and dialogue among policy makers,

administrators, teachers, and advisors. These efforts should be directed toward removing or reducing the negative impact of existing barriers. Study findings and respondent comments to the open-ended questions would suggest that the WVDE has effectively addressed many of the early concerns and issues associated with implementation of the performance based student assessment model (West Virginia University Institute of Technology, 2010$_d$; West Virginia Career and Technology Administrators, 2009). Stakeholder involvement in the evaluation of performance based assessment principles and practices is indicated as several comments were provided which allude to a need for classroom teachers to be more involved in the development and design of an assessment model which addresses the local demographics, population characteristics, and the needs of the local business and industry community.

The population for this study was identified because these groups of teachers (engineering/technical, hospitality, and health occupations) were accessible to the researchers, shared similar induction and certification requirements, and possessed similar support structures through a division of the WVDE. However, other skill clusters (e.g., business and marketing education, agriculture and forestry technologies, computer information systems, etc.) exist under the umbrella of career and technical education in West Virginia. A similar study involving teachers in these program areas, and the integrated core subject areas (language arts, communication, social sciences, etc.), would provide a data base for comparisons. Such studies could provide guidance for future professional development programming and implementation of common core standards across the curriculum (Common Core Standards Initiative, 2010).

For example, one might expect communications (speech, performing arts, etc.) teachers to exhibit high levels of knowledge and use in performance based student assessment practices related to interviews, simulated work situations, team building, and attitude/interpersonal exercises as those skills are naturally fostered in the communications and performing arts environment. Conversely, one might expect teachers in the technology program areas to exhibit somewhat lower scores on assessment practices related to rubrics, attitude/interpersonal, and oral communication activities, simply because so many skills in programming, game development, and technology repair areas are performed and evaluated on an individual basis with self-paced, online programmed testing and feedback. Teachers and students in information systems technologies are often limited in group work by virtue of the reality-based individual work environment, as evidenced by content standard objectives in those information systems technology career clusters (West Virginia Department of Education, 2010_b).

It was not surprising that a high percentage of respondents (88.1%) reported participating in some kind of formal training related to performance based student assessment, as such training is made available at the state, regional, and county levels by a variety of agencies. A surprising finding, however, was the role of school provided in-service and the role of peer support as the two most often reported sources of training. Despite the availability of multiple formal training opportunities, peer support from fellow teachers was the prevailing mode of training. These findings would provide support for increased attention to teacher peer mentoring development in career and technical education. Additionally, concentration on integrating the professional learning community concept into comprehensive high schools and career centers could facilitate teacher efficacy related to performance

based student assessment, integration of career and technical education content with core subject matter, and team teaching.

Responding teachers also made several positive comments regarding their satisfaction with the communication and guidance from the West Virginia Department of Education relative to implementation of performance based student assessment. The relationship between the WVDE and teachers statewide appears to be strengthening teacher advocacy for and comfort with the adopted West Virginia career and technical student assessment model. Teacher advocacy and buy-in are critical to the success of any new and different educational programming (Fullan, 2002). State and local program coordinators and administrators should maintain communication strategies and professional development activities in place at the present time and build additional support elements to complement those already in place.

Data related to knowledge levels by cluster were interesting in that the lowest rated practices were not concentrated in one particular skill cluster. Rather, the lowest rated practices (assessment rubrics, checklists, and portfolios) were spread across three clusters (job-specific knowledge and skills, information and communication, and personal and workplace productivity). Because these are more sophisticated practices, it could be argued that career and technical education teachers would benefit from continued emphasis on rubrics, checklists, and portfolio building activities in induction, certification, and professional development programming. The importance of teacher capacity building in order to support students in these practices is supported by the literature, as Lynch (2000), Xu (2004), and Backes (2009) all emphasize the importance of job-seeking, job-keeping, and life skills in preparing a student for life in the community and the workplace. Doppelt (2009) adds teacher

capacity and adaptability as key components for successfully implementing student-centered, formative assessment in the learning process.

The personal experience of a supervisor or teacher will generally influence ability to support others in similar activities (Xu, 2004). A teacher with work or educational background that included building a portfolio for employment or advancement, or interview, presentation and portfolio development related to projects or securing contracts, will likely be more comfortable, and should be more proficient in guiding students in developing those skills and evaluating their quality. Study findings are consistent with this concept.

Comparison of knowledge and use levels of performance based student assessment practices by cluster suggests a trend. Scores were generally higher for the job-specific knowledge and skills and thinking and problem solving skills clusters, than for personal and workplace productivity and information and communication skills clusters. One explanation may be that, traditionally, career and technical education teachers are highly proficient in their particular business, industrial, or service occupation, as evidenced by the rigorous requirements for occupational, state and/or national certifications required by the West Virginia state policy regarding minimum requirements for licensure and certification (West Virginia Department of Education, 2010_c).

Collaboration with business and industry stakeholders is the most logical means of maintaining a current picture of what employers wish to see in applicants. This is important to validating curriculum in marketing of educational programs and preparing students with a realistic view of potential jobs (Lie et al. 2009). Many occupations require individual production and project work on a job-site, both of which contribute to the individual worker's continued employment or advancement

on the job. Searching for information, written and verbal communication, and transfer of knowledge/skills to others may or may not be a priority in a specific business and industry setting. Langer and Applebee (1988) appear to support this concept as they contend that effective learning must include skill development as well as subject knowledge. The knowledge and use levels by cluster suggest that teachers pay close attention to the relationship between learning and skill proficiency for the workplace.

Although they were statistically significant and moderately strong, the correlations between knowledge and use levels for cognitive/knowledge tests and job/workplace simulations/case studies assessment practices fell at the lower end of the moderately strong range. Several factors inherent in the induction and certification process may contribute to these weaker correlations. Beginning career and technical education teachers are required to complete two courses which include student assessment and test construction content during their first two years of teaching. Teachers must demonstrate proficiency in test item construction, grading, rubrics, and administration of cognitive assessments for purposes of satisfying requirements for completion of the new teacher observation and evaluation by the field-based career and technical teacher educator. From that time, no formal expectation exists for the teacher to demonstrate or be accountable for using teacher-made cognitive tests, and many prefer to use pre-packaged curriculum (including tests) and/or test bank items, essentially negating the need for regular and consistent cognitive test item construction. These findings provide direction for teacher educators as they revise career and technical education preparation programs to include student performance based assessment practices (West Virginia University Institute of Technology, 2010$_b$).

With respect to the correlation between knowledge and use levels for job/workplace simulation/case studies, one contributing factor may be the expected delay in developing a new mindset during the transition from industry to the classroom. During this transition, the career and technical education teacher often finds it easier to complete a task for a student, direct individual students in step-by-step task completion, or provide self-directed task completion in a lab setting, rather than develop group work stations and allow students the freedom to perform, make mistakes, and learn together as a team. The case study, team approach and project completion with minimal direction may remove the teacher's sense of control during the learning process, effectively discouraging the teacher from using the workplace/case study learning model.

The only individual performance based assessment practice with a correlation coefficient in the very strong (r = .75 - .99) category for the knowledge and use level relationship was instructional technology exercises. Several factors may contribute to this strong relationship between knowledge and use levels. Upon employment, or shortly thereafter, the new career and technical education teacher commits to pursuing requirements for the first five-year career and technical education teaching certificate, a program of study and testing which culminates at the end of the third year of teaching. The prescribed program of study, embedded in WVDE Policy 5202 (West Virginia Department of Education, 2010_c), includes a required three credit hour course in either basic or advanced computer applications in career and technical education, demonstration of increasing proficiency in the use of instructional technology in lesson planning, instruction and assessment, and integration of technology in classroom management, student documentation, and recording/reporting as required by program administrators at the state, county, and

building level. Teacher educators administer a survey and observe new teachers' technology expertise to assess entry skill levels and assign each new teacher to the level of technology course deemed most appropriate.

Expectations are high for new teachers to commence online record keeping, data entry, formative and summative performance based assessment, requisitioning of supplies and services, and to provide the technology enhanced instruction inherent in career and technical education. To facilitate this process, the new teacher is provided with immediate, ongoing, individualized support for developing basic and/or advanced technology skills, and, therefore, may be expected to perceive themselves as having a substantial level of knowledge and be regular users of technology tools and skills.

Content Standards and Objectives (CSOs), guide instruction throughout every career cluster. With respect to the high correlation between knowledge and use of instructional technology activities, another major contributing factor may be that, within the CSOs for each program, demonstrated mastery of GLOBAL21 and 21st Century skill sets is required for a student to successfully complete a program and/or occupational certification program. Based on this curriculum design, every career and technical education teacher in West Virginia must embrace, and effectively incorporate instructional technology in teaching and learning activities. The Association for Career and Technical Education supports this concept as they argue that entering the career and technical teaching field from business and industry with advanced technical skills is not sufficient – that the CTE teacher must also have the capacity to apply those technical skills in instruction and assessing student progress (Association for Career and Technical Education, 2010).

Study findings suggest that the program area in which a teacher teaches generally does not make a difference in the knowledge and use levels of performance based student assessment practices. An exception is the significant difference between level of use for job-specific knowledge and skills of teachers from engineering/technical/hospitality and health science technology areas. One factor which may contribute to this difference is the disparity in preparatory program experiences between health science technology teachers and teachers in the engineering/technical and hospitality programs. There is a high degree of consistency among bachelor's degree programs and certification and licensure exams for registered nurses, with a requirement for each career and technical program in the state to have a coordinator with a minimum of a bachelor's degree. In comparison, the occupational preparation programs experienced by respondents teaching in engineering/technical and hospitality programs tend to be much more divergent and inconsistent across institutions and training agencies. These differences suggest that documented levels of repeated performance of proficient job-specific knowledge and skills may be more consistent for health occupations practitioners and health science technology teachers, thus contributing to the higher knowledge and use scores.

This trend of health science technology teachers reporting higher levels of knowledge and use than engineering/technology/hospitality teachers was consistent across the remaining clusters except for the personal and workplace productivity skill cluster and the totals. Many engineering/technical/hospitality workers become career and technical teachers in West Virginia without prior higher education, or with few college credit hours on a transcript. Health science technology teachers generally have a two-year or four-year degree in a health field. The background content in liberal arts coursework, the requisite requirements for legal documentation, practice

with tracking patient progress through a therapeutic regimen, and strong curriculum emphasis on developing comfort and competency with communication and patient teaching skills, all may contribute to higher health science technology teachers' knowledge and use levels of performance based student assessment practices. In contrast, engineering/technical/hospitality workplace experience is, by nature, focused on production and product quality, with much on-the-job peer orientation and, often, little pre-employment education.

Although the study design did not include any analysis of mean differences between levels of knowledge and use for each of the 20 performance based assessment practices, such an analysis provides a unique view of the data. Mean differences for the 20 practices ranged from a low of .01 on questioning strategies to a high of .62 on applied math activities. Mean differences for five additional practices fell between .39 and .46. This same pattern was evident for each cluster and the mean differences between knowledge and use levels ranged from .80 to 1.17. The knowledge level mean was larger than the use level mean for all practices and clusters. These data should provide policy makers and administrators some direction for planning initial preparation and professional development programs as they focus on closing the gap between knowledge and use levels.

Study findings clearly indicate that training makes a difference in the capacity of a career and technical education teacher to implement performance based student assessment in the classroom. In all cases, teachers who reported they had participated in training reported higher levels of knowledge and use scores across all clusters. Shepard (1995) concluded that lack of a particular prior experience may or may not contribute to an individual's capability to perform on a level with others who had that same prior experience. However, based on the findings of this study, a teacher's

information and communication level of knowledge scores may reflect prior experience and comfort levels with the behaviors required to implement practices in that cluster.

Study findings indicate that years of teaching experience make a difference in both levels of knowledge and levels of classroom use of performance based student assessment practices. Teachers with the most years of experience consistently reported the highest levels of knowledge for each skill cluster and the total knowledge score. Findings were similar for the level of classroom use of performance based student assessment practices. These study findings regarding the critical role of teaching experience also appear to be supported by other studies (Ekuri et al., 2011).

Responses to the demographic variable questions provided some interesting insight into the characteristics of the career and technical workforce in West Virginia. Career and technical education teachers are experienced as 43.85% reported 11 or more years of teaching experience and 24.8% reported between six and 10 years of experience. State and district administrators will need to consider this experience base as they develop plans for sustaining and enhancing the performance based student assessment initiative in West Virginia. In addition, this information will be useful to state and district level administrators as they evaluate and revise mentoring programs and pair new teachers with mentors at the local level.

The responses to the demographic variable questions also provided some unanticipated findings related to the experience of the CTE teacher population with performance based student assessment on a personal level. Two-thirds (67.3%) of the respondents reported they had completed an in-field occupational competency assessment as a requirement for obtaining their career-technical teaching certification. Even more surprising was the finding that almost nine of 10 responding teachers

reported they had received training to implement the performance based student assessment practices. This personal experience in completing such assessments and the participation in training may have been factors in what could be characterized as reasonably high levels of knowledge reported by respondents.

Findings point to the importance of state, district, and building level administrative support and sustenance for teacher efforts to implement performance based student assessment. Administrator preparation curricula could enhance capacity of these individuals to monitor and manage the implementation of performance based student assessment practices within their facilities. Advocacy for infrastructure and funding relies on information gathering and sharing with policy makers and upper level school system administrators. In addition, every school system reflects geographical, demographic, and cultural diversity. For each group served (policy makers, state, district, local and building administrators, business, industry and community representatives, teachers, parents and students), a model must be put in place to provide for stakeholder dialogue as part of the educational program assessment, evaluation, and planning process. Such models can take the form of advisory committees, cooperative work programs for students, or clinical/workplace agreements with local employers. McLaughlin and Warren (1994) provide a rationale for providing these supports as they contend that student success can occur only if fundamental systemic support strategies are included.

Student understanding of the benefits of performance based student assessment would contribute to a teacher's success in implementing assessment practices on a regular basis. Performance based assessment can be used in peer assessment, to identify benchmarks in student progress, and as summative demonstration of student mastery of knowledge and skills. Success will be enhanced

with a high level of student and teacher acceptance of the practices as meaningful to the student as he or she leaves the classroom for the workplace.

Study findings indicate respondents perceive time constraints as a major barrier to the successful implementation of performance based student assessment practices. Citing the current guidelines and regulations for instructional minutes, clinical or workplace experience minutes, restrictions/earmarks placed on minutes during the typical instructional day, varied instructional time models (block scheduling versus traditional class periods), and travel time required among career and technical education centers and feeder schools, teachers report frustration with finding time to implement multiple assessment strategies.

The concepts of instructional innovation and scheduling flexibility are explored and encouraged, but, in reality, not commonly practiced in most career and technical education facilities. Teachers are bound by other schools' schedules, current graduation requirements, and have minimal control of which students they receive the first day of each new school term. As marketing and recruiting programs evolve, and as administrators and policy makers adjust their thinking along the continuum from "always done it this way" to "this will provide teachers with adequate assessment time," the frustration with time, in general, may decrease.

Demographic findings related to training on performance based assessment, as well as data related to knowledge and use levels for individual practices and clusters, can provide guidance to program administrators and faculty of the West Virginia Career and Technical Education Teaching Certification Program in evaluating and revising the teacher preparation curriculum. At the time of this study, the required 21 credit hour block of career and technical education teacher certification program included content on student assessment in two courses. These syllabi reflect

pedagogy related to summative testing, traditional cognitive test item construction, grading, and relating test items to course objectives. There were also learning activities related to hands-on, job skill assessment using teacher-made competency check lists and introduction of a variety of daily checklists which document student behaviors and attitudes during class and clinical/lab experiences. Hamilton (2010), however, does provide a word of caution, suggesting that an effective summative assessment model is dependent on the presence of adequate formative assessment.

Performance based student assessment was addressed only briefly in these syllabi and there were no learning activities provided to give new teachers practice on components of model integration. Considering the adoption and implementation of the West Virginia Performance Based Student Assessment model and study findings revealing that teachers perceived the teacher certification program one of their major resources for training on the model, certification program administrators would be wise to revise the assessment elements of the curriculum to include practical applications for performance based student assessment. Teachers would then be equipped to utilize performance based assessment practices with their students earlier in their induction period.

Because all public school career and technical education teachers in West Virginia are expected to prepare students for at least one annual performance based student assessment, documented proficiency in integrating performance based assessment strategies in instruction should also be included as an item in the student teacher performance assessment instrument (West Virginia University Institute of Technology, 2010_d). This document is completed during the first three years of teaching, as the teacher is observed in the classroom by a field-based teacher

educator, and is an integral component in a teacher being recommended for the five-year career and technical education teaching certificate.

Based on the literature (Marzano, Pickering, & McTighe, 1993; Wiggins & McTighe, 2005), performance based student assessment has gradually become a core element in today's classroom. While general educators grapple with developing and adopting models that will effectively measure student mastery of general subjects, career and technical educators are improving and refining a model which has its origins in the decades old work based/vocational learning model. In the 21st Century and GLOBAL21 models, educators employ application of knowledge, demonstration of workplace skills, and development of attitudes in determining student readiness for entry-level employment. A principal element of performance based student assessment is the capacity of assessment managers to respond to the dynamics of the regional and global workplace. To effectively address workplace/employer needs, those charged with administrator and teacher preparation require a fluid database upon which to build current, relevant curriculum and from which instructional and assessment strategies can be designed, selected, prioritized, and applied to meet stakeholder needs. Study findings provide an example of these data.

A collaborative relationship between business and industry representatives and the career and technical education teacher is fundamental to building a partnership which will guide curriculum in preparing students to be successful entry-level employees. In order to cultivate and nurture the business/industry and education relationship, the career and technical education teacher must possess knowledge and skills related to student development and performance based assessment. A new teacher needs experience and support in order to build capacity to articulate and apply performance based student assessment practices with students and with perspective

employers. The survey instrument (*Performance Based Student Assessment in Career and Technical Education*) provides a foundation for a professional development placement tool as state department of education, local administrators and teacher preparation program officials plan individualized, multi-level training and re-training on performance based student assessment principles and practices. The relationships established and fostered among stakeholders in the West Virginia career and technical education performance based student assessment process not only facilitated the completion of this study, but remain as a basis for on-going collaborative assessment, program planning and professional development.

Recommendations for Further Research

This study investigated and provided insight into the levels of knowledge about and the levels of use of performance based student assessment practices by engineering/technical, hospitality, and health science technology teachers in West Virginia career and technical education classrooms. The study also sought to describe relationships, if any, between levels of knowledge about and levels of use of those practices. Finally, the study examined the factors identified by teachers as being supports or barriers to their implementation of performance based student assessment practices. Based on study findings, the following recommendations for further research are provided:

1. This study focused on engineering/technical, hospitality, and health science technology teachers in West Virginia career and technical education facilities. Expanding this study to include business and marketing, agriculture and forestry technology and information systems technology teachers in the study population may provide additional data that would support general conclusions and implications regarding teacher capacity to implement

performance based student assessment across the board in career and technical education.

2. This study focused on career and technical education teachers. Extending this study to include general education teachers (in the core subject areas) may provide additional data that would support general conclusions and implications regarding overall teacher capacity to implement performance based student assessment in all areas of public education.
3. Respondents in this study perceive the receptiveness and support of administrators as integral to their success in implementing performance based student assessment. A study investigating district and building administrators' knowledge and experience levels with respect to performance based student assessment practices may reveal current capacity and training needs of administrators to provide support to their teachers in implementing performance based student assessment practices in the classroom.
4. The survey instrument in this study included two open-ended items asking respondents to identify factors perceived as supports and/or barriers to implementation of performance based student assessment practices. Incorporation of additional qualitative research methods (focus groups, field observations, interviews) may provide a more detailed understanding of teacher and administrator perceptions related to performance based student assessment.
5. This study was conducted one time, with career and technical education teachers of all levels of teaching experience. Developing a pre-survey to be administered to a new teacher upon employment from business and industry would provide baseline data levels of knowledge about and levels of use of

performance based student assessment practices. Administering the survey used in this study at the end of the first full year of teaching and again at the end of the teacher's third year of teaching (when the teacher has met eligibility requirements for the first five-year teaching certificate) would develop data trend lines. Such a study would provide comparative data to document teacher progress in gaining the performance based student assessment skill set. The third-year benchmark assessment would be incorporated into the recommendation for certification.

6. Building on findings from this study, conduct a mixed methods study of administrators and teachers from career and technical education and general education to determine common issues related to the professional learning community and team teaching concepts supported by the comprehensive high school model as they relate to the implementation of multiple assessments and performance based student assessment across the curriculum. This study would add to the literature and would provide support for collaboration between career and technical education and general education, and lend validity to efforts to integrate curriculum and address common core standards.
7. This study focused on perceptions of career and technical education teachers related to their levels of knowledge about and levels of use of performance based student assessment practices. A follow-up study of career and technical education program graduates could describe the impact of performance based student assessment on graduates' performance once they are on the job.
8. This study focused on perceptions of career and technical education teachers related to their levels of knowledge about and levels of use of performance based student assessment practices. A follow-up study of employer

perceptions related to the value of performance based student assessment in preparing graduates for entry-level jobs would provide a basis for career and technical education program evaluation and curriculum improvement. Study findings would also guide assessment program administrators in modifying existing performance based student assessment models, developing new performance based student assessment models, and forging mutually supportive relationships with business and industry.

Concluding Remarks

Study findings provide a foundation for career and technical teacher education administrators and teacher educators to address performance based student assessment practices in teacher induction, certification and professional development programming. West Virginia's engineering/technical/hospitality and health occupations teachers responding to the survey described their level of knowledge about performance based student assessment practices as good to very good, and their level of use of those practices as regularly to frequently. Data indicate a moderately strong relationship between teacher level of knowledge and level of use of performance based student assessment practices. In addition, respondents identified factors which they considered to be supports or barriers to their efforts to implement performance based student assessment practices in the classroom. Findings describe the levels of knowledge and use of performance based student assessment practices from a statewide sample of teachers, providing a foundation for administrators and teacher education faculty to include performance based student assessment as a key component in teacher induction, certification, and professional development programming.

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APPENDICES

Appendix A: Survey Instrument

Performance Based Student Assessment in Career and Technical Education

Part A. Teacher Information -- Please answer the following questions:

1. Program cluster area in which I teach
(check one):

___ a. Technical/Industrial/Engineering

___ b. Health Sciences/Nursing

2. Program level(s) I currently teach
(*check all that apply*):

___ a. Secondary

___ b. Post-secondary

3. Years of teaching experience (total):
(check one):

___ a. <1

___ b. 1 – 5

___ c. 6 – 10

___ d. 11 or more

4. Type of school/facility in which I teach
(*check one)*:

___ a. Comprehensive high school

___ b. County CTE center/Career Academy

___ c. Multi-county CTE center

___ d. Job training/retraining facility

___ e. Institutional education facility

5. I completed a performance based competency test (i.e. NOCTI performance) in my field as a requirement for my career-technical teaching certification:
(check one)

___ a. Yes

___ b. No

6. I received training to implement performance based student assessment practices:
(check one)

___ a. Yes

___ b. No

7. If the answer to #6 above is "Yes," training was received from the following resources*:*
(check all that apply)

___ a. Talking with fellow teachers

___ b. School-provided in-service

___ c. County-provided in-service

___ d. WVU Tech coursework/workshops

___ e. WVDE (State Department) in-service

___ f. Performance Based Test Manual

___ g. WVDE (State Department) website

___ h. Other: *(specify "other" training on this line)*_____

Continued on Back

Part B. Levels of Knowledge and Use – Following is a list of performance based teaching practices. Using the scale provided for Column A, circle the response that best describes your level of knowledge about each performance based teaching practice. Next, using the scale provided for Column B, circle the response that best describes the frequency with which you use each performance based teaching practice in your CTE classroom and/or lab.

	Column A	***Column B***
	Level of Knowledge	**Level of Use**
	1 = poor	**1 = seldom**
	2 = fair	**2 = sometimes**
	3 = good	**3 = regularly**
	4 = very good	**4 = frequently**
	5 = exceptional	**5 = very frequently**
	Level of Knowledge	**Level of Use**
Performance Based Assessment Practices		
1. Cognitive/Knowledge tests	**1 2 3 4 5**	**1 2 3 4 5**
2. Knowledge assessment rubrics	**1 2 3 4 5**	**1 2 3 4 5**
3. Psychomotor/Skill checklists	**1 2 3 4 5**	**1 2 3 4 5**
4. Skill assessment rubrics	**1 2 3 4 5**	**1 2 3 4 5**
5. Affective/Attitude checklists	**1 2 3 4 5**	**1 2 3 4 5**
6. Attitude assessment rubrics	**1 2 3 4 5**	**1 2 3 4 5**
7. Instructional technology skills exercises	**1 2 3 4 5**	**1 2 3 4 5**
8. Student use of machines/equipment	**1 2 3 4 5**	**1 2 3 4 5**
9. Questioning strategies	**1 2 3 4 5**	**1 2 3 4 5**
10. Critical thinking/Problem solving	**1 2 3 4 5**	**1 2 3 4 5**
11. Project based learning activities	**1 2 3 4 5**	**1 2 3 4 5**
12. Job/Workplace simulation/case studies	**1 2 3 4 5**	**1 2 3 4 5**
13. Portfolio building	**1 2 3 4 5**	**1 2 3 4 5**
14. Resume development	**1 2 3 4 5**	**1 2 3 4 5**
15. Interview skills exercises	**1 2 3 4 5**	**1 2 3 4 5**
16. Oral communication activities	**1 2 3 4 5**	**1 2 3 4 5**
17. Technical reading activities	**1 2 3 4 5**	**1 2 3 4 5**
18. Technical writing activities	**1 2 3 4 5**	**1 2 3 4 5**
19. Applied math activities	**1 2 3 4 5**	**1 2 3 4 5**
20. Group work/Team building	**1 2 3 4 5**	**1 2 3 4 5**

Part C. Teacher Comments:

1. Please list factors which you view as **supporting and/or facilitating** your efforts to implement the WVDE GLOBAL21 CTE Student Performance Assessment in your program:

2. Please list factors which you view as **barriers** to your efforts to implement the WVDE GLOBAL21 CTE Student Performance Assessment in your program:

Thank you for taking time to participate in this survey.
Please return completed survey to the designated location in your school office

Appendix B: Panel of Experts

Individuals who reviewed the survey instrument prior to its use included:

Expert A -- R.N., M.S., Instructor, Health Science Technology. Fifteen years teaching experience, Three years experience with performance based student assessment in West Virginia career and technical education.

Expert B -- M.A., Administrator, multi-county career and technical education school. Four years administrative experience. Former Social Studies teacher. Three years experience with performance based student assessment in West Virginia career and technical education.

Expert C -- M.S., Administrator, multi-county career and technical education school. Fifteen years administrative experience. Former Business Education teacher. Three years experience with performance based student assessment in West Virginia career and technical education.

Expert D – M.S., Associate professor, Teacher Educator, West Virginia University Institute of Technology, Montgomery, West Virginia, Fifteen years teacher education experience. Former health science technology instructor. Three years experience with performance based student assessment in West Virginia career and technical education.

Expert E – M.S., Associate professor, teacher educator, West Virginia University Institute of Technology, Montgomery, West Virginia. Eighteen years teacher education experience. Former instructor, hospitality/culinary arts. Three years experience with performance based student assessment in West Virginia career and technical education.

Appendix C: Institutional Review Board Approval

Office of Research Integrity
Institutional Review Board
401 11th St., Suite 1300
Huntington, WV 25701

FWA 00002704

IRB1 #00002205
IRB2 #00003206

November 15, 2011

Ronald Childress, Ed. D.
MUGC Education Department

RE: IRBNet ID# 280774-1
At: Marshall University Institutional Review Board #2 (Social/Behavioral)

Dear Dr. Childress:

Protocol Title:	[280774-1] TEACHER PERSPECTIVES ON PERFORMANCE BASED STUDENT ASSESSMENT IN CAREER AND TECHNICAL EDUCATION: IMPLICATIONS FOR ADMINISTRATOR AND TEACHER PREPARATION
Expiration Date:	November 15, 2012
Site Location:	MUGC
Submission Type:	New Project APPROVED
Review Type:	Exempt Review

In accordance with 45CFR46.101(b)(1), the above study and informed consent were granted Exempted approval today by the Marshall University Institutional Review Board #2 (Social/Behavioral) Chair for the period of 12 months. The approval will expire November 15, 2012. A continuing review request for this study must be submitted no later than 30 days prior to the expiration date.

This study is for student Brenda Tuckwiller.

If you have any questions, please contact the Marshall University Institutional Review Board #2 (Social/Behavioral) Coordinator Michelle Woomer, B.A., M.S at (304) 696-4308 or woomer3@marshall.edu. Please include your study title and reference number in all correspondence with this office.

Appendix D: Request for Permission to Survey

TO: West Virginia CTE Administrators [on current e-mail address list]
FROM: Brenda.Tuckwiller@mail.wvu.edu
DATE: November 16, 2011
SUBJECT: CTE Teacher Survey

Dear CTE Director/Administrator,

This is a request for permission to distribute a survey to the teachers in your building. Career and technical teachers are being invited to participate in a state-wide, anonymous research survey entitled ***"Performance Based Student Assessment in Career and Technical Education."*** The survey is being conducted as a part of my doctoral program requirements for Marshall University. Information provided will assist us in developing teacher preparation and professional development curriculum designed to help West Virginia CTE teachers implement performance based instructional practices.

The 2-page paper questionnaire will take approximately ten (10) minutes to complete. Participation is completely voluntary. Replies will be anonymous. Individual teachers and schools will not be identified. The teacher may choose to withdraw or not participate without penalty or loss. Blank surveys may be returned or discarded.

If teachers choose to not answer any question, they may simply leave it blank. **Teachers will be asked to return completed survey questionnaires within two weeks following receipt of the instrument and information letter**. A plain white envelope is provided with each survey questionnaire. Teachers are asked to return surveys in the sealed envelopes to a designated location in the school office of each school. A drop box will be provided for collection of the surveys. The principal investigator or the co-investigator will pick up the drop box with the completed questionnaires at the end of the designated response period. I look forward to sharing results of the study with you at the summer 2012 WV CTE Conference.

If you have questions, you may contact me by phone at 304-667-9118, by e-mail at Brenda.Tuckwiller@mail.wvu.edu, or at my personal mailing address listed above. If you have questions concerning the rights of teachers participating in this research process, you may contact the Marshall University Office of Research Integrity at (304) 696-4303. Dr. Ron Childress, principal investigator for this study, may be reached at rchildress@marshall.edu , phone 304-746-1904.

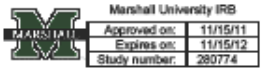
Please reply to this e-mail by 3:00 p.m., November 23, 2012. A reply of "Yes" indicates that I have your permission to distribute and collect the survey questionnaires in your building. A reply of "No" indicates that I do not have your permission to distribute and collect the survey questionnaires in your building.

Thank you for your assistance with this survey and for your continued support to our teachers.

Brenda L. Tuckwiller, Ed.S.

Appendix E: Participant Information Letter

Participant (Teacher) Information Letter



RR 60 Box 65
Clintonville, WV 24931

Dear Career/Technical Education Teacher:

You are invited to participate in an anonymous research survey entitled ***"Performance Based Student Assessment in Career and Technical Education."*** As a career and technical educator, you are in a unique position to offer insight into the current usage of performance based assessment practices in the career and technical classrooms and labs across our state. The information you provide will offer valuable assistance in looking at the certification and professional development curriculum for career and technical education teachers in West Virginia.

This study is being conducted as a part of doctoral research at Marshall University. The survey is comprised of a two-page (one-page back and front) paper questionnaire which will take approximately ten (10) minutes to complete. Your replies will be anonymous, so do not put your name anywhere on the form. Participation is completely voluntary. If you choose to withdraw or not participate there is no penalty or loss of benefits; you may either return or discard the blank survey. You may choose to not answer any question by simply leaving it blank.

Returning the completed survey to the collection site in your school by the end of the second work week following receipt of this letter confirms that you are 18 years of age or older, that you are a career and technical teacher, and gives your consent for use of the answers you supply. A plain white envelope is provided for survey return. There will be a designated location in your school office for collection of completed surveys.

If you have any questions about the study you may contact me by phone at 304-667-9118 during the day, via e-mail Brenda.Tuckwiller@mail.wvu.edu, or at my personal mailing address above. If you have questions concerning your rights as a research participant you may contact the Marshall University Office of Research Integrity at (304) 696-4303. Dr. Ron Childress, principal investigator for this study, may be reached at rchildress@marshall.edu , phone 304-746-1904.

If you wish to view results of this survey, that information will be made available to teachers during summer 2012. You may wish to keep this letter for your records.

Thank you,

Brenda Tuckwiller, Ed.S.

Appendix F: Performance Based Practice Clusters

Based on the GLOBAL21 initiative overview on the West Virginia Department of Education website (www.wvde.state.wv.us/GLOBAL21), the following soft-skills categories are identified as critical to student workplace entry:

- Information and communication skills (information and media literacy, visual literacy, oral and written communication, research, instructional technology management, articulation of thought and ideas, etc.)
- Thinking and problem solving skills (analysis, reasoning, systems, synthesis, etc)
- Personal and workplace productivity skills (teamwork, collaboration, ethics, accountability, etc.)

The West Virginia GLOBAL21 Student Assessment model for West Virginia career and technical education students includes the three categories above in addition to the career-specific, task-oriented competencies:

- Job-specific knowledge and skills for each program area

For purposes of analysis (ancillary findings), the 20 individual performance based assessment practices listed in Part B of the survey instrument (Appendix D) were categorized into the four practice clusters defined above:

Practice Cluster	Category	Description	Survey Part B Items
GLOBAL21 Skills Cluster 1	Job-specific skills	Application of principles/techniques in work setting	1, 2, 3, 4, 8
GLOBAL21 Skills Cluster 2	Information and communication skills	Information, media, visual, oral, written literacy; technology, research, articulation of thoughts, etc.	7, 13, 14, 16, 18
GLOBAL21 Skills Cluster 3	Thinking and problem-solving skills	Decisions, analysis, reasoning, synthesis, problem solving, questioning, etc.	9, 10, 15, 17, 19
GLOBAL21 Skills Cluster 4	Personal and workplace productivity skills	Teamwork, ethics, collaboration, self-direction, leadership, accountability, projects, initiative, production, etc.	5, 6, 11, 12, 20

Appendix G: Factors Identified as Supports to Implementation of Performance Based Assessment

Appendix G: *Factors perceived as supports to implementation of performance based student assessment practices as reported in Part C, Item 1 survey responses*

Teacher Support	Resources and Time	Training	Other
<u>Administrative/Teacher Support</u> • Ability to be creative and the school supporting that. • The administration. • Our principal. • WVDE Support. • Tracy [state coordinator of PBA] helpful. • Director supporting the purchase of online learning curriculum aid • Assistance from co-workers • PCTW is new—this is my first PBA • School admin a big help • Questions/problems answered promptly (same day). • Support from above (administration). • School support. • Other teacher support. • The support provided by WVDE.	<u>Instructional Technology</u> • Technology • Changing technology • Technology—having access to a computer lab daily. • We have a computer lab! • There is a very strong emphasis on technology and its applications in this building. • Students use computers daily. • Practice on machines, computers, etc. • My course of instruction includes a wide variety of technology which students are required to master.	<u>Training</u> • Training. • Training • TIS Training • Staff development helps. • Staff development. • Need more. • In-service. • Training • Plenty of training—It makes my job easier. • Training by Tracy Chenoweth has been effective. • Training. • Training and call for help.	<u>CTE Curriculum Characteristics</u> • Internships • Performance exams • *KeyTrain* • *Today's Class* • The very nature of the subjects we teach and the hands-on methods we use and have always used • We teach/instruct in work place environment • Teaching with the best electrical simulators from Amatrol. • NCCER is coming next year • Hands-on and applied academics. • Oral presentations. • CSO(s). • *KeyTrain*.

Teacher Support	Resources and Time	Training	Other
• School offers facilities to do so. • Our department. • My own resources. • A great dept. Chair. • Other teachers in my field throughout the state. • A great Voc. Director. • Voc. Director co-operation. • Supportive staff—quick with assistance. • Support from principal. • Small class size. • Our HS/CTE Director is behind us 100%. • Help from the State (Tracy) • People I can call. • Strong support from school administration. • Flexibility with courses. • County CTE Director (Joe Starcher). • Tracy Chenoweth [State PBA coordinator] • Tracy [Chenoweth, State PBA coordinator] • Administration • Faculty	• Use of technology available. • Adding needed software and hardware updates to computers and other equipment. • Technology is always up to date. <u>Resources</u> • Websites that offer rubric ideas. • The web site • Rubrics provided. • Website helpful! • Web site links are excellent. • The availability online of activities & lesson plans to help implement. • Bringing more modern tools into classroom. • Up to date equipment. • Availability of materials and resources. • Up to date equipment. • Online resources. • Equipment update	• Prior knowledge of test • Teachers are prepared and know how to implement the Performance Assessment. • State workshops in my area. • State conferences and meetings .	• Hands-on. • *ScanTool.* • Constant hands-on projects. • Teamwork activities. • Communication skills. • Self-assessment skills. • Each skill is evaluated in the classroom. • We do a lot of team projects between classes. • Student work in many projects for other programs. • Reviewing each procedure taught & performing it. • The use of our broadcast equipment allows my students to work in real life experiences. • Most of these apply to technical skills. My students learn basics so they can get to this level. • WorkKeys practice. • Workplace simulations • *WV Writes* should be a plus • Related reading materials • Hands on.

Teacher Support	Resources and Time	Training	Other
• My school staff • My parents • My students • Myself • Our lab is very conducive to testing. • Our administration is cooperative & supportive during testing. • Discussion with other instructors. • Both high schools ensuring students have time for scheduled assessment dates and makeups. • Our administration, superintendent and board are very supportive. • This is my first year teaching. I am just learning this information. • Purchase of new equipment • My personal motivation/initiative • Help from other staff members. • There are good supporting efforts from the state department of education in adjusting the test to better judge the students taking the Global21. • Having someone to ask questions about assessment	• Updated technology. • Adequate supplies, equipment & physical resources (including lab). • Laboratory facilities. • In-facility lab. • Clinical rotations. <u>Time</u> • Testing window allows time for administration, school's options to set times (ex. day/night) • Flexibility of time allotment. • Using block schedule very beneficial. • The amount of time for testing.		• Real world experiences. • *SkillsUSA* professional development information. • I support problem solving. • Use of technology. • Communication skills. • *KeyTrain*. • Critical thinking activities. • Project based learning and technology in the classroom is utilized on a more regular basis. • Real world challenges are provided. • Resources and equipment are always available. • CTE Instructors work with core classes. • Offers math that student need to know. • Group activities. • Computer use. • Simulation labs. • Clinical activities. • *WINN* • Use of technical writing & reading.

Teacher Support	Resources and Time	Training	Other
• Excellent facilities and equipment • My administration. • Support from county and administration. • I feel I have support at all levels, state, county and school. <u>Industry/Community Support</u> • Advisory committee input. • We use Toyota and other industry to help improve the classroom. • Having judges come in after hours to grade finished project is very helpful. • Strong advisory council members who are willing to give up time in order to evaluate students. • Contractor support • Vendor support • Advisory committees • A chance for teachers to return to industry to see changes • Each skill is evaluated at the externship site. • Industry support and technology. • Advisory council • Having an abundance of			• Checklists and rubrics for projects & skills • Each class lecture, assessment and hands on shop performance is emphasized as to a real world application and realization. • Standardized CSOs • *WorkKeys* • End of course assessment • Enforce CTE CSOs so students are prepared for Global21. • *KeyTrain* • *KeyTrain* • *WorkKeys* • Estimate materials list • Research technology • Blueprint reading <u>Student-related Factors/Impact</u> • [Assessment] leads to a WVDE certificate. • Students enjoy it—feel comfortable doing tasks related to field of study.

Teacher Support	Resources and Time	Training	Other
examiners to pull from--Several retirees and Chesapeake Energy give two of its employees the time off to help with the testing. • Advisory council and industry support Good local advisory committee that meets regularly to discuss program's needs and be the proctors of the assessment			• Is a good tool for student ability • Excellent for students to apply their skills to help them seek out employment. • In-house licensed childcare center. • Students are prepared. <u>Performance Based Assessment Model Characteristics</u> • Hands-on aspect of the assessment versus a written assessment • [Based on] industry standards • Test covers what is in the curriculum • Places student into situations where they have to perform. • Checks not only the students' knowledge but also what they can do. • Real test of knowledge. • Industry-credentialed. • Places students into real life situations.

Teacher Support	Resources and Time	Training	Other
			• Good test base. • Assesses appropriate skills • Moving to a more practical approach

Appendix H: Factors Identified as Barriers to Implementation of Performance Based Assessment

Appendix H: *Factors perceived as barriers to implementation of performance based student assessment practices as reported in Part C, Item 2 survey responses*

Teacher Support	Time	Funding/Resources	Other
<u>Administrative/Counselor support/Teacher support/Training</u> • Not enough resources • Not enough training • Many different rubrics and skills checklist available—which one will WVDE use? • Every point counts—not sure how to prepare students. • Too much time spent on other endeavours other than the program's IGOs i.e. *ToolingU* & *WorkKeys* • A fellow PLTW Veteran (master teacher) as a mentor would be helpful. • Need to know more about program to implement • Had some training—need more	<u>Time</u> • Time • Time constraints • Time constraints • Not enough time • Time—not enough of it • Time. Hard with clinical schedule • The amount of time it takes to complete the assessment • Time • Classroom time during testing of other students • Loss of teaching time because of this we cannot replace. • Time frame for classes. • Time constraints	<u>Financial/Funding/Resources</u> • Funding. • Cost. • Funding. • Money. • Equipment & resources to have more hands-on activities. • Tests are expensive for supplies—reimbursed, but must supply funds. • Money for up-to-date equipment and tools. • Money to buy supplies • Supplies • Finances • Funding and resources. • Funding to engage student learning. • Lack of funding to obtain latest in equipment and technology	<u>Student Attitudes</u> • Student lack of motivation to work • Attendance. • Lack of work ethic from students • Students not taking it to heart, not seeing what good they are getting from it. • Lack of discipline. • Attendance • Student attitudes • It means nothing to students. • Student motivation at times • Students' willingness to follow directions. • Student commitment • Lack of student interest. <u>Student Abilities/Learning Styles/Capacity</u>

Teacher Support	Time	Funding/Resources	Other
• More training • Time limits in classes & extensive CTOs's to cover during the school year. This limits how long you can work on an activity. • Just more paperwork. • Emphasis by WVDE on SO many things. Making a priority list, then another, and another (too much fluidity). It's not possible (in my opinion) to do everything req'd—pick & choose they try to meet those stds. • So much other work. Other project assigned by administrators. • Sometimes it seems that the definition I have is not shared by admin. • Covering all CSOs if we are off school due to inclement weather and interruptions to the school day. • My experience on what is	• Time • Time • Time • Not enough time, too much to do now! • Not enough time to teach. • Time • Time to find evaluators from business and industry • Timing • Time • Lack of free time in school. • Time. . . • Time to learn/train ourselves. • Time to plan lessons. • Time to evaluate assessments. • There is NEVER enough time. • Time to prepare	• A lack of funds to update equipment & acquire latest technology currently in use in the work world. • Funding • Cost to implement • Lack of funding. • Access to tool sets etc. Limited • Supplies. • The need to accomplish so much with less than sufficient equipment—Frequently things are "hand-me-down" from the core education • Lack of textbooks. • Money (cause some limitations) • Funds for materials that would help with Global21. • Quality of materials and available space for the number of students. • Resources. • Tools or equipment broken or missing.	• Student ability. • Student abilities • Students not being taught basic skills prior to coming to a VoTech Center (i.e. math, reading, spelling). We are work field instructors not basic instructors. This should be done prior to the students arriving here. • Some students don't work good alone. • Some students are too young. Junior year should be the minimum. • Students burn out from feeder schools—no math skills • Really big problem with basic math—higher level trig+ has no application outside of an ACT test, etc. • Students who lack basic English and Math skills. • Student reading and math levels. • Special ed students that do not have the ability to "build" the given project being assessed

Teacher Support	Time	Funding/Resources	Other
needed or necessary. • Support from high school. • Getting students here from Co-op or Externship. • Lot of interruptions and activities can't be helped. • School interruptions. • I am new. • My class does not have a performance test • Not enough training in subject area to present/implement WVDE Global21 CTE. • Too much work added. • BOE Rules & Regulations • Comprehensive HS • Placing students in the program just to have a place to "stick" them. • My co-worker <u>REFUSES</u> to adapt to using the website and practice with students. • Need to learn more on portfolios and writing resumes. • More one-on-one training.	good learning. • Too many requirements in the hours we have. • Not enough time. • Time to practice. • Not time to do all. • Time to practice with students before spring tests with labs and CSOs required. • Time on instruction. • Time. • Time. • So much stuff to do and time restrictions. • Time. • Time to complete assessment. • Not enough time. • Time with students in the classroom. Many home/school activities interfere with instructional time in CTE.	<u>Instructional Technology</u> • Need more computers, software, etc. • Limitations within the program—i.e. technology that seldom works, lab issues, printer failure • Lack of technology: 5 students to 1 computer • Additional requirements that are not specific to my class • Not enough advanced technology • Need more computers. • Computer access. • Lack of funding. • Lack of technology. • Need more technology hardware in my room. iPads, computers, Kindles or Nooks. • No printer in classroom <u>School Infrastructure</u> • Shop has no electrical	the same way • I currently have 19 freshman students. They are too immature to comprehend the material in the CSOs. • Having students with special need slows things down ex: autistic, ADD, etc. I lose my brighter students when the majority of students have an IEP. • Safety is a factor too. My second year autistic student has started 3 times because he says he forgets. • Student skill level/CSOs • Re-teach Academic Skills!! • I have younger kids in 10th grade—limits to tool access. • Overload of special needs students. • Not familiar—not applicable for my students at present time. <u>Assessment Model Characteristics/Items/Content</u>

Teacher Support	Time	Funding/Resources	Other
• Institutional limits on activities. • Restricted setting • Cannot take off campus • Class size over 15 in all areas (including Health Care, Business and ProStart) • Over crowding classrooms. • Large numbers. • Large classes. • Frequent interruptions. • I'm supposed to teach them but [I feel} I'm not competent to evaluate my own students, according to the WVDept. • More professional development is needed in specific areas. • Not enough training. • Expectations. <u>Industry/Community Support</u> • Finding judges from industry • Finding facilitators	• Time constraints. • Time vs. CSOs. • Time for the test. • Expectations for 2 certifications with <u>ALL</u> the other material we teach. • Time allotment is difficult. • Time. • Time. <u>Test Scheduling/School Calendar</u> • The school needs to better understand how to schedule students in the CTE programs • Assessment is given before all CSOs are covered, perhaps moving the testing back • Timing of the tests • Schedule • Timing	service for training on equipment. • Poor internet access. • Limited access to internet, etc. • Limits to access.	• The assessment rules/policies change yearly. • The assessment doesn't always reflect the skills learned in the classroom/lab. • The students cannot use real examples of real projects they have worked on. • Most tests have mistakes. • Some tests need to incorporate all test areas into an overall project, i.e. Building Construction • 5 separate tests incorporate into one project maybe • Lack of hands-on instruction in WVDE GLOBAL21 CTE Assessment • When the test is too complex or unclear • Performance tests should be industry standard. • Need to be more industry based in each field. • Content not related. • Evaluation guidelines & requirements are overdone and too restrictive.

Teacher Support	Time	Funding/Resources	Other
• Finding judges from industry • Getting people to help from industry • Finding judges to give up a day of work to evaluate the students • Lack of community willing to be involved. • Time from industry to assist if required • Having judges leave their place of work, etc., • Hard to get judges to come. • Difficult to get industry to assess students during the work day • It is sometimes difficult to get industry people in to be judges. • Trying to find qualified people to score the assessments. • Difficult to have industry give up their time and money to come in to test students. • Outside industry helping	• Scheduling with academic classes, etc. • When the test has to be spread out over days • Scheduling (students) • School schedule. • Spring Break • Make-up testing is a problem. • Graduation requirements.		• FACS program has been rewritten & does not meet the needs of the students. It is too general & not specific to necessary skills needed. • Some inconsistencies in planning stage. • Lessons for all the content standards. • The only thing in the past was poor blueprints, but that as taken care of with an update last year. <u>Miscellaneous Comments on "*Barriers"* Survey Item</u> • Too much assessment and testing on the students. • Enough tests already. • We test the students too much on other things. They get tested out before we give the test. • A good idea—just hard to do here. • It was 100% better last time,

Teacher Support	Time	Funding/Resources	Other
judge, they don't want to leave work. • Providing industry people to perform testing is a large barrier because of scheduling and lack of payment to evaluators. • Ability to get evaluators, business and industry people. • When we have to have 3 judges for the same skill • Availability of outside evaluators • Bringing in outside people who are not teachers asking them to grade theory • It's hard to get support from business as in time, they are too busy working and trying to make ends meet. • Technician from industry won't come to test students on their own time for free. Companies won't release techs during the middle of the work day.			from the first time which was terrible. • Space.

Teacher Support	Time	Funding/Resources	Other
• Not realistic. People from industry cannot give up days work to evaluate students (without pay)l • Difficult to have someone leave their job to perform the assessments although our council has been very helpful and cooperative. • Finding licensed nurses to give up a day or two for testing purposes. • Getting judges to come to the school. • Difficulty obtaining qualified evaluators. • There is absolutely no need for outside evaluators. • It's hard to find outside evaluators that can come during school hours & not miss work. I'm supposed to teach them but [I feel] I'm not competent to evaluate my own students, according to the WV Dept. • It is difficult for people in business to take time out of			

Teacher Support	Time	Funding/Resources	Other
their schedules to test. • It is difficult to find people (medical personnel) in the community to assist with testing. It would be great if the testers could be compensated. • Evaluators do not have time to leave work. • Getting professionals to come out and evaluate my students. • Using advisory members or business owners. • Obtaining outside personnel to implement the assessment. • The Advisory members have real jobs to do and their time is valuable.			

CURRICULUM VITAE

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EDUCATION

Marshall University
Doctor of Education in Curriculum and Instruction, 2012
Education Specialist in Curriculum and Instruction, 2011
Master of Education in Vocational Technical and Adult Education, 1985

West Virginia University
Bachelor of Science in Nursing, 1972

CERTIFICATION

State of West Virginia, Practical Nursing, 7 – Adult, Vocational Education (Career and Technical Education). Permanent.
State of West Virginia, Nursing Assistant, 7 – Adult, Vocational Education (Career and Technical Education). Permanent.
State of West Virginia, School Nurse, PK – 12, West Virginia State Certification. Permanent.

PROFESSIONAL EXPERIENCE

2006 - present	Assistant Professor, West Virginia University Institute of Technology, Montgomery, WV
2011 - present	Chair, Department of Career and Technical Education, West Virginia University Institute of Technology, Montgomery, WV
2010 - present	Part-time Instructor, Marshall University, South Charleston, WV
2001 - 2009	Adjunct Instructor, New River Community and Technical College, Lewisburg, WV
1994 - 2006	School Based Health Coordinator/School Nurse, Greenbrier County Schools, Lewisburg, WV
1987 - 1994	Assistant Professor, West Virginia University Institute of Technology (then West Virginia Tech), Montgomery, WV

1992 - 1994	Chair, Department of Vocational Technical Education, West Virginia University Institute of Technology (then West Virginia Tech), Montgomery, WV
1984 - 1987	Teacher, Practical Nursing and Health Occupations, Greenbrier East High School, Greenbrier County Schools, Fairlea, WV
1972 - 1984	Registered Nurse, HUMANA, Inc., Greenbrier Valley Medical Center, Fairlea, WV
1974 - 1984	Associate Administrator/Director Nursing Services, HUMANA, Inc., Greenbrier Valley Medical Center, Fairlea, WV

CONSULTING

Consultant activities involving government agencies (U.S. and international), public school systems, and institutions of higher education), focus on curriculum development, teacher preparation, faculty professional development, and industrial trainer development:

1988 - 1989 Consultant – on-site faculty training of multi-subject community college curriculum development in areas of technical, industrial, health and business occupational training programs for secondary students and adult. Regional campus of University of Hawaii, Honolulu, HA, Guam Community College, Agana, Guam.

1989 - 1990 Consultant – on-site faculty teacher training in curriculum development and classroom management for the national training program for registered nurses at Belize Technical College, and co-facilitated (with N. Browning, Ph.D. West Virginia Institute of Technology) faculty development exchange program between Belize Technical College, Belize City, Belize, C.A. and West Virginia Institute of Technology (now WVU Institute of Technology). Ministry of Education, Belize, Central America.

1992 - 1994 Consultant – Workshop facilitator. Train-the-Trainer industrial in-service manager training. Monsanto Corporation, Nitro, WV.

1998 - 1990 Consultant – Workshop facilitator. VALIC Annuities statewide project. Educate the Educator training to certify long-term care facility in-service directors as required by West Virginia Department of Health and Human Services.

1999 Consultant – county-wide professional development workshops on Classroom Organization and Management and Student Engagement. Webster County Schools, Webster Springs, WV.

GRANT ACTIVITIES

2011 - 2012 Grant Manager, West Virginia Career and Technical Education Teacher Certification and Licensure Program through West Virginia University

Institute of Technology, a West Virginia Department of Education Grant ($450,000), annual budget and funding for statewide, field-based induction and credentialing for beginning teachers in career and technical education clusters in West Virginia public, secondary schools, county, multi-county and stand-alone career education centers, and Office of Institutional Education schools.

1999 - 2003 Project Manager, West Virginia Department of Education School Based Health Clinic Project, Greenbrier County Schools, funded through a West Virginia Department of Education, Office of Healthy Schools grant ($30,000), a three-year pilot project in 7 rural West Virginia counties to provide access to immediate assessment and treatment of acute illness and accident on-site, during school hours, by licensed health-care professionals—with a goal of impacting absenteeism and promoting wellness among students and staff. Collaborated with facility designers, facilitated orientation of health-care professionals and orientation of administrators, faculty, staff, students, parents and community to the School Based Health Clinic model. Monitored and evaluated three school-based sites and provided interim data and a final project report at the end of the pilot period to the West Virginia Department of Education, Office of Healthy Schools.

PAPERS AND PRESENTATIONS

Tuckwiller, B., & Childress, R. (October 2008). *Pursuing the Doctorate at 70 MPH: A Cohort Program Comes of Age.* Paper presented at the Southern Regional Council on Education Administration Annual Conference, Charleston, WV.

Tuckwiller, B., & Childress, R. (October, 2009). *Teacher Perspectives on Instructional Technology: Administrative and Policy Implications.* Paper presented at the Southern Regional Council on Educational Administration Annual Conference, Atlanta, GA.

Tuckwiller, B., & Childress, R. (November, 2009). *21st Century Instructional Technology in the Career and Technical Classroom and Laboratory: Teacher Use and Perspectives.* Paper presented at the Association for Career and Technical Education Annual Conference, Nashville, TN.

Tuckwiller, B., Crowe, P., Lee, S., & Toney, H. (March, 2010). *Working Effectively with Your Chair.* Session presented for the Marshall University Doctoral Seminar. South Charleston, WV.

Tuckwiller, B., & Childress, R. (October 2010*). Stakeholder Participation in Program Evaluation: A Model for School and District Administrators*. Paper presented at the Southern Regional Council on Education Administration Annual Conference, Savannah, GA.

Tuckwiller, B., Haught, R., & Jenkins, V. (December, 2010). *Performance Based Student Assessment: Lessons Learned in One State's Pilot Study.* Presentation at the Association for Career and Technical Education Annual Conference, Las Vegas, NV.

Tuckwiller, B., & Toney, H. (October, 2011). *Building the Doctoral Portfolio.* Session presented for the Marshall University Doctoral Seminar. South Charleston, WV.

Tuckwiller, B., Childress, R., Crowe, P., Lee, S., & Toney, H. (October, 2011). *Selecting a Dissertation Topic.* Session presented for the Marshall University Doctoral Seminar. South Charleston, WV.

Tuckwiller, B., & Childress, R. (November, 2011). *Benchmarking Progress in a Doctoral Cohort: A Follow-up Study of Student Perceptions.* Paper presented at the Southern Regional Council on Educational Administration Annual Conference, St. Louis, MO.

PUBLICATIONS

Tuckwiller, B. (1989). Staying Current: Every Health Care Professional's Responsibility. *Techniques.* Journal of the Association for Career and Technical Education.

Tuckwiller, B., & Childress, R. (2009, October). The Cohort Model Applied in a Doctoral Progam: An Interim Assessment from a Case Study. *Southern Regional Council on Educational Administration 2009 Yearbook.*

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Tuckwiller, B., & Childress, R. (2012, Vol.38). A Model for Stakeholder Participation in Educational Program Evaluation. *National Social Science Journal.*

Tuckwiller, B., & Childress, R. (2012). Benchmarking Progress in a Doctoral Cohort: A Follow-up Study of Student Perceptions. *Southern Regional Council on Educational Administration 2012 Yearbook.*

TECHNICAL REPORTS AND OTHER PAPERS

Tuckwiller, B. (2010, December). *West Virginia University Institute of Technology Department of Career and Technical Education Five-Year Program Review: Bachelor of Science in Career and Technical Education Degree Program and West Virginia Career and Technical Education Teacher Certification and Induction Program.* Institutional departmental review. West Virginia University.

Tuckwiller, B. (2009). *Teacher Educator Characteristics and Strategies Applied with Adult Learners in a Professional Development/Induction Setting.* Non-published. Descriptive study completed as a part of a qualitative research project with N. Debela, Marshall University, for use by the West Virginia

University Department of Career and Technical Education Career and Technical Teaching Certification Program.

Tuckwiller, B. (2004, June). *Integrated School Based Health Clinics in Greenbrier County Schools: Final Report on a Pilot Project*. A report on a three-year project funded by a grant through the West Virginia Department of Education, Office of Healthy Schools.

PROFESSIONAL MEMBERSHIPS AND ACTIVITIES

Association for Career and Technical Education (ACTE), 2006 - Present.

Academy for Career and Technical Teacher Education (ACTTE), 2006 - Present.

Association for Supervision and Curriculum Development (ASCD), 2006 - Present.

Southeastern Technical and Industrial Education Conference (STIEC), 2006 - Present.

Office of Institutional Education Programs (OIEP) Advisory Board, 2006 - Present.

National Reading Association (NRA), 2009 - 2010.

West Virginia Department of Education and West Virginia University Institute of Technology Career and Technical Education Advisory Committee, 2011 - Present.

West Virginia University Institute of Technology Faculty Evaluation Cluster Committee, 2010.

Southern Regional Education Board (SREB), Official Observer. Teacher Training Pilot, South Carolina, 2010.

West Virginia University Foundation Funds Advisory Board, 1999 - 2000.

Greenbrier County Board of Health. 2006 - 2010.

West Virginia University Extension Strategic Planning Committee, 2009 - 2010.

West Virginia University Alumni Outreach Board, 2000 - 2006.

West Virginia University Jackson's Mill Conference Center Improvement Project, 2003.