

An Examination of the Relationship Between SkillsUSA Student Contest Preparation and Academics

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ABSTRACT

Career and Technical Student Organizations (CTSOs) assert they are assisting students in developing leadership, teamwork, citizenship, problem solving, communication, and academic skills for workplace success, but with limited research on their outcomes, are these empty claims? With integration of academics being a major Career and Technical Education (CTE) priority, and CTSOs named integral partners in meeting requirements of the 2006 Perkins legislation, this study has been conducted for the purpose of (a) determining what students need to know and do to prepare for the SkillsUSA Occupational Health and Safety national competition, and (b) to determine if contest competencies naturally align with Pennsylvania 11th Grade Academic Standards to identify if academic rigor is associated with contest preparation. Findings may be useful to SkillsUSA advisors preparing students for the occupational health and safety competition or those interested in learning about the integration of challenging and rigorous academics in context via CTSO involvement.

Introduction

Vocational Student Organizations (VSOs), now termed Career and Technical Student Organizations (CTSOs) have been an integral component of Career and Technical Education (CTE) since the passage of the Smith-Hughes Act of 1917 (Alfeld et al., 2007; Threeton & Pellock, 2008). While the George-Barden Act of 1946 was the first piece of federal legislation to specifically mention VSOs, the Smith-Hughes Act of 1917 allocated funding for vocational teachers whose duties included advising and supervising these organizations (Hale, 1990). Over the last 92 years the scope of CTE has dramatically changed, but the integral relationship between CTE and CTSOs remains. A significant development and current federal priority includes strengthening the academic skills of CTE students by integrating academic instruction (Walter & Gray, 2002). The Carl D. Perkins CTE Improvement Act of 2006 names CTSOs as an integral partner of CTE programs in integrating academics and technical standards. While the focus of this paper is on the relationship between CTSO student contest preparation and academics, it may be extremely difficult to comprehend without a brief summary of significant CTE legislation, which has led to increased pressure to integrate academics within career and technical instruction.

Over the past 20 years, societal pressure to integrate academics within CTE has greatly increased within the U.S. This phenomenon is grounded in the notion that America is falling behind other nations in its ability to compete in the rapidly changing global marketplace, which in the end reflects the evolution of federal support for vocational education (Finch, 1999). Threads of this educational movement can be traced back to the passage of federal legislation such as the Carl D. Perkins Act of 1984 where the intent was to provide access to all students including special populations while addressing the economic and social demands of America.

Further concern for America losing its competitive technological edge led to legislative reform such as the Carl D. Perkins Vocational and Applied Technology Act of 1990. The Perkins Vocational and Applied Technology Act of 1990, also known as Perkins II, was intended to strengthen the workforce preparation process which included the integration of academics and vocational education, alliances between education and the workforce (including tech-prep) and closer linkages between school and work (Gordon, 2003).

While there have been several other significant federal reform initiatives such as the School-to-Work Opportunities Act of 1994 and the Carl D. Perkins Act of 1998 the passage of the Perkins II legislation signified a major development in vocational education (Threeton, 2007). In fact, scholars have suggested that Perkins II represents the most dramatic shift in vocational education policy since the inception of federal funding to secondary education because the emphasis was placed on academics, as well as occupational skill development and learning (Hayward & Benson, 1993). Today, this shift remains visible in the current Carl D. Perkins CTE Improvement Act of 2006.

The Carl D. Perkins CTE Improvement Act of 2006, also known as Perkins IV was passed by Congress and was signed into law by President George W. Bush. Perkins IV is ultimately intended to strengthen the focus on responsiveness to the economy; while tightening up the accountability statement in regard to the integration of academics and technical standards (Threeton, 2007). Moreover, Perkins IV identifies CTSOs as an integral partner of CTE programs as well as in meeting the requirements of this 2006 legislation.

Overview of Career and Technical Student Organizations

Vocational Student Organizations (VSOs), now termed Career and Technical Student Organizations (CTSOs) have been an integral component of Career and Technical Education (CTE) since the passage of the Smith-Hughes Act of 1917 in which educators whose responsibilities included advising a CTSO could utilize funds (Alfeld et al., 2007; Threeton & Pellock, 2008; Hale, 1990). Scholars have suggested that this integral relationship between CTE and CTSOs is a characteristic of many vocational programs (see Figure 1) (Thompson, Thompson & Orr, 2003; Vaughn, 1999). The U.S. Department of Education currently recognizes eight CTSOs at the secondary level which include Business Professionals of America (BPA), Distributive Education Clubs of America (DECA), Future Business Leaders of America (FBLA), Family and Community Leaders of America (FCCLA), FFA (formerly Future Farmers of America), Health Occupations Students of America (HOSA), SkillsUSA (formerly Vocational Industrial Clubs of America) and Technology Students of America (TSA).

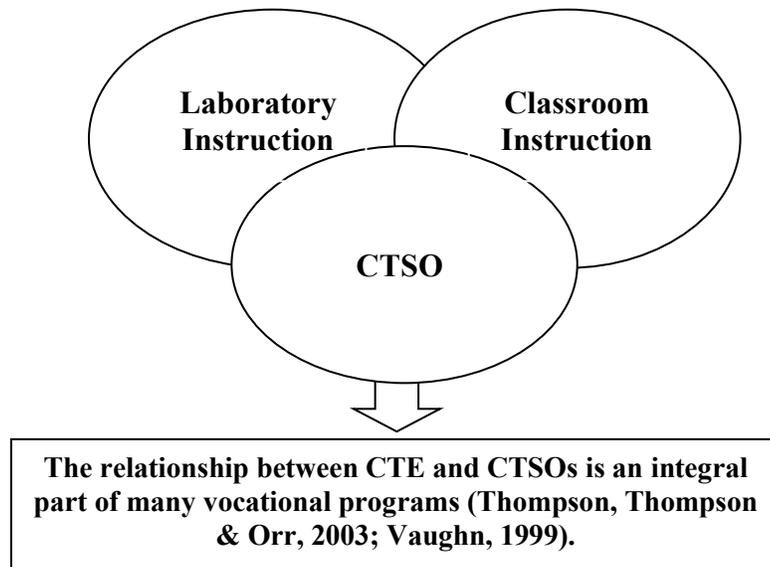


Figure 1. The integral relationship between CTE and CTSOs.

Over the last 92 years, a plethora of CTSO activities have been developed in the areas of skills contests, leadership development and community service (Alfeld et al., 2007). Furthermore, these organizations have been credited for providing the opportunity for students to gain valuable experience in leadership, teamwork, citizenship, problem-solving, communication and self-management skills. Litowitz (1995) identified that:

One element common to [CTSOs] are the student competitive events. These events add challenge and excitement to classrooms and student conferences. These competitive events also encourage students to plan and design their solutions to the best of their ability. These students often test the limits of established standards in a constant effort to produce a product that is faster or more attractive or stronger than those produced by others. (p. 25)

In addition, several scholars have suggested that CTSO competitive events naturally integrate academics into industry based problem scenarios (Alfeld et al., 2007).

The Problem

The value of participation in CTSOs has become increasingly evident and the degree of professional emphasis within them has greatly increased over the years (Litowitz, 1995). However, business and industry professionals have expressed concern regarding the lack of foundational skills in potential employees. Cotton (1993) reported that the literature has suggested that employers have no issue with the skill performance of today's graduates, but rather have serious doubts about their non-technical abilities. CTSOs assert they are assisting students in developing experience in leadership, teamwork, citizenship, problem solving, communication, self-management and academic skills for workplace success, but with limited research on the outcomes of these organizations are these empty claims?

While there is an enormous amount of CTE professionals that support the belief that CTSOs are beneficial to students, several scholars continue to question their value. For example, Lankard (1996) stated that:

Although participation in these student organizations has been associated with the development of positive work attitudes and leadership skills, it is unclear the extent to which involvement in a career technical student organizations contributes to students' career and occupational development (p. 1).

Zirkle and Connors (2003) suggested that the problem seems to be the absence of verifiable evidence that supports the claim that members develop essential workplace skills through involvement, and as a result, there has been increased attention and encouragement for these organizations to develop an authentic assessment procedure, which measures the outcome of participation.

These non-technical skill deficit concerns can be observed by examining several high profile reports such as America's Choice and the Secretary's Commission on Achieving Necessary Skills (SCANS) report. For example, the SCANS report (1991) identified eight major competencies surrounding successful workplace performance which include: (a) Resources - providing staff, materials, and space, (b) Interpersonal Skills - connecting with a team, clients, and customers via positive interaction, (c) Technology - understanding the productivity tools and equipment in the workplace, (d) Systems - improving social, organizational, and technological systems of the workplace, (e) Information - obtaining, appraising, and communicating data to team members and clients, (f) Basic skills - possessing solid literacy and computational skills, (g) Personal Qualities - demonstrating maturity, responsibility, commitment, and confidence, (h) Thinking Skills - utilizing creativity and higher-order analysis to solve convoluted problems (p. 5). Over the years, the ability to measure these essential skill sets has become a national priority (Berman, n.d.). Due to the curricular assessments demands of the day, the most notably essential skill set as of late appears to be the basic skills competency (i.e., reading, writing, listening, speaking, and mathematics) identified in the SCANS report.

Today, with the pressure to respond to the "No Child Left Behind" (NCLB) legislation, all areas of education in the U.S. are at a crossroad (Sims & Sims, 2006). The NCLB legislation has raised the bar in all educational settings (Hull, 2004). An example of the bar being raised in CTE can be observed by examining the Perkins IV legislation. Furthermore, Perkins IV identifies CTSOs as an integral partner of CTE programs as well as in meeting the requirements of this 2006 legislation. With an existing integral relationship between CTE and CTSOs the bar is raised in the eight nationally recognized student organizations as well. Thus the task of integrating academics and technical standards is the role of both CTE instructor and the CTSO advisor.

Purpose and Research Questions

While a recent study has suggested that CTSO competitive events naturally integrate academics into industry based problem scenarios and that these competitive events positively

affect grades, academic engagement, SCANS-type academic/job skills, and career self-efficacy in students (Alfeld et al., 2007), little research has been conducted which specifically examines what is required by students in preparation for competitive events. More specifically, few studies have examined what students need to know and do to prepare for these competitive events.

With the integration of academics being a major priority within CTE, and CTSO being named an integral partner in meeting the requirements of the Perkins IV legislation, this study has been conducted for the purpose of (a) determining what students need to know and do in order to prepare for the SkillsUSA Occupational Health and Safety national competition, and (b) to determine if the contest competencies naturally align with any of the Pennsylvania State 11th Grade Academic Standards in order to identify if academic rigor is associated with the contest preparation. This study sought to answer the following questions:

1. What did students need to know and do in order to prepare for the SkillsUSA Occupational Health and Safety national competition?
2. Do the SkillsUSA Occupational Health and Safety national competition competencies naturally align with any of the Pennsylvania State 11th Grade Academic Standards?

Overview of the SkillsUSA Occupational Health and Safety Competition

According to the SkillsUSA Technical Standards (2008) the Occupational Health and Safety competition provides an opportunity for students to showcase the health and safety activities of their respective technical program through a scrapbook that highlights important health and safety accomplishments (i.e., via four competency categories). These health and safety activities are assessed on the planning and organization of four projects (i.e., lab safety survey, machine and equipment safety, environmental safety and industrial site) as well as the final outcome of these projects. The students are interviewed and the scrapbooks are evaluated by a designated panel of judges on quality, content as well as the candidates' presentation during the interview process. The researchers in this study chose to examine the SkillsUSA Occupational Health and Safety competition because health and safety is a major concern in every career and technical program and CTSO thus the results of the study could be more applicable within diverse areas of CTE.

Theoretical Framework

Many students today are unable to grasp what is being taught in the classroom without a "real world" connection of some kind (Threeton & Pellock, 2008). Moreover, research within the cognitive sciences has suggested that students tend to learn better when the educational setting is modeled after "real world" learning outside of school (Brown, Collins, & Duguid, 1989). CTE provides a context in which essential academic skills needed for transition to the workplace are enhanced (Stone, 2005). CTE and CTSOs together utilize a technique known as contextual learning in order to help students develop these essential workplace skills. Research has demonstrated that learning is greatly enhanced through contextual experience (Kolb, 1984; Gardner, 1999). According to contextual learning theory, learning occurs when students process

new information or knowledge in such a way that it makes sense to them in their own frames of reference” (CORD, 2007, p. 1).

Astin’s Theory of Involvement naturally aligns with both contextual learning as well as CTSO student involvement. Astin (1985) emphasized the function of student involvement in development. Moreover, Astin asserted that students develop by becoming engaged in activities. Engagement in state and national CTSO competitions within SkillsUSA could be considered an example. Astin (1985) suggested five fundamental items to consider with this theory:

- (a) Involvement requires investment of psychological and physical energy in objects (for example, tasks, people, activities),
- (b) involvement is a continuous concept – different students will invest varying amounts of energy in different objects,
- (c) involvement has both quantitative and qualitative features,
- (d) the amount of learning or development is directly proportional to the quality and quantity of involvement, and
- (e) educational effectiveness of any policy or practice is related to its capacity to induce student involvement. (p. 306)

For the purpose of this study the theoretical framework of contextual development within Astin’s Theory of Involvement has been utilized as a foundation (see Figure 2).

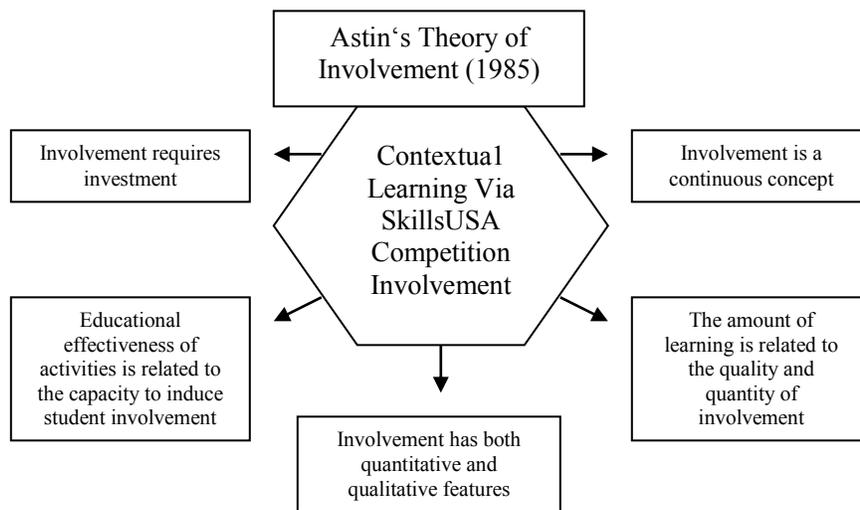


Figure 2. Contextual learning within Astin’s Theory of Involvement.

Methods

Procedure for Research Question One

In order to answer question one, a series of face-to-face SkillsUSA advisor interviews were conducted in the summer 2006 at the national SkillsUSA competition to determine what students needed to know and do in order to successfully prepare for the occupational health and safety national competition in Kansas City, Missouri. Given that SkillsUSA student contest participants and advisors must be successful in the state competition in order to qualify for

participation at the national level, the decision was made to only interview the most highly qualified advisors, which oversee the student preparation for the occupational health and safety national competition. For the purpose of this study a highly qualified advisor was: (a) a CTE professional that advised an active SkillsUSA chapter, (b) an advisor that actively prepared students for the SkillsUSA Occupational Health and Safety competition through a combination of classroom instruction and hands-on experience, and (c) had at least one student that was successful enough at the state level occupational health and safety competition to qualify for participation at the national level during the summer of 2006.

After permission to conduct this research study was granted by the National SkillsUSA Office in Leesburg, Virginia and human subjects protocol approval, advisors were verbally invited to participate following the occupational health and safety competition judges meeting. Eleven of the 14 SkillsUSA advisors (78.5%) present at the national competition agreed to participate in an individual interview with the primary investigator by signing the informed consent form. The participating SkillsUSA advisors collectively represented ten different states including Delaware, Florida, Georgia, Maryland, Nebraska, New York, Ohio, Tennessee, Texas and Virginia.

Each participating advisor was informed that their participation was voluntary and that the scope of this research project was three fold. First, it was designed to help the CTE profession. Second, it was designed to determine what students needed to know and do in order to prepare for the occupational health and safety national contest. Third, it was designed to identify if SkillsUSA students required the use of academics in preparation for the occupational health and safety national contest. During the advisor interviews, participants were simply asked what students needed to know and do in order to prepare for the occupational health and safety contest at the national level. Interviews generally lasted approximately twenty minutes each. The interviews followed the format of question one, although each session had a unique dialog that often included unscripted discussions. Finally, a crosscheck procedure of verbally summarizing the transcribed data and confirming it with each participant was utilized to verify the accuracy of interview responses.

Data Analysis for Research Question One

All of the data were transcribed during each interview and later transferred to a Microsoft Word file. The data were then organized in a Microsoft Excel spreadsheet for analysis. The qualitative data were analyzed first by identifying themes related to what students needed to know and do in order to successfully prepare for the occupational health and safety national competition. Keywords and phrases were used to obtain the list of themes. The primary investigator (PI) and another researcher (i.e., not a subordinate of the PI) independently performed this task. The qualitative data were coded in Microsoft Excel with numerical identifiers that labeled the common themes. The identification of themes and the association of a response with a theme were compared and discussed between the primary investigator and the other researcher until a consensus was reached. Furthermore, frequency counts of the themes were tabulated and interesting and noteworthy comments were identified for presentation within this paper. It should be noted that the primary investigator and researcher were both experienced in qualitative thematic analysis.

Procedure for Question Two

With the data collected, all of the 11 CTSO advisors interviewed in question one indicated that students needed to know how to read and comprehend to successfully prepare for the SkillsUSA Occupational Health and Safety national competition. Furthermore, advisors also mentioned specific reading strategies used during contest preparation. While advisors in this study mentioned additional academic skills such as writing using correct grammar, spelling and punctuation having a part in contest preparation, the frequency counts of these themes were much lower. Given that competency is defined as “an area of knowledge or skill that is critical for producing a key output” (McLagan, 1989, p.77) and since all advisors agreed that students needed to know how to read and comprehend to successfully prepare for the SkillsUSA Occupational Health and Safety national competition, the decision was made to specifically examine what, if any, Pennsylvania State Reading Standards align with the contest competencies. Thus in order to answer question two a focus group of eight Pennsylvania career and technical educators were charged with the task of identifying what, if any, of the Pennsylvania State 11th Grade Reading Standards would naturally align with the SkillsUSA Occupational Health and Safety national competition competencies in order to determine if academic rigor was associated with the contest.

The focus group consisted of eight career and technical educators from the center region of Pennsylvania, four of which were active CTSO advisors (i.e., two SkillsUSA and two HOSA advisors). These educators were recruited for this focus group because they all had previous experience naturally aligning academic standards with their CTE curriculum and instruction, and were well versed in working with CTSOs. These educators were verbally invited by the primary investigator to participate in the research study focus group and all accepted by signing an informed consent form.

Data Collection and Analysis for Question Two

This focus group session took place in the spring of 2007 and lasted approximately two hours in length. The focus group was first given a copy of the occupational health and safety contest guidelines, competencies and the Pennsylvania State 11th Grade Reading Standards and were asked to read and examine the documents individually. The primary investigator then asked the focus group members to individually analyze the demands of the contest and determine what, if any, of the reading standards would naturally align with the competition competencies. Next the group was asked to come to a consensus on which, if any, of the reading standards would naturally align with the contest competencies and record their answers in the form of alphanumeric codes corresponding with the reading standards on a spreadsheet rubric, which itemized the competencies by category. The completed spreadsheet rubric was collected and the data were immediately tabulated in Microsoft Excel. Finally, a member-check process was utilized to verify the accuracy of responses recorded within the Microsoft Excel spreadsheet.

Findings

Research Question One

Given that SkillsUSA student contest participants and advisors must be successful in the state competition in order to qualify for participation at the national level, the decision was made to only interview the most highly qualified advisors that oversee the student preparation for the occupational health and safety national competition. Nine of these 11 advisors (81.8%) indicated that they advised students that had previously qualified for the occupational health and safety national competition. Table 1 summarizes the qualitative data by frequency and percentage of similar SkillsUSA advisor responses.

Table 1
What did students need to know and do in order to prepare for the SkillsUSA Occupational Health and Safety national competition? (n =11, multiple common themes by response)

Responses	Frequency	%
Students need to be familiar with the basics of business and industry safety; including OSHA Regulations, First Aid, CPR and Fire Safety	11	100
Students need to know how to read and comprehend the rules and guidelines in order to successfully prepare for the contest	11	100
Students need to write using correct spelling, grammar and punctuation	9	81.8
Students need to realize that preparation for the contest is a time commitment and that time management is key	8	72.7
Students need to know how to speak in public for the interview process	8	72.7

While the majority of advisors interviewed in question one indicated that students needed to know how to read, comprehend and write using correct spelling, grammar and punctuation to successfully prepare for the competition, specific strategies were mentioned which could be considered noteworthy. For example one SkillsUSA advisors stated:

“I simply run copies of the contest guidelines and hand it to every student to read, they have their own copy to refer back to so they can see from the beginning what is required and how the judges are scoring the contest. From this point we assign responsibilities to each student to carry out such as writing statements for the safety notebook or preparing for the contest interview or maybe forming a safety committee...”

“Reading the information on the contest requirements helps the kids know what they need to do, so now they come in with more pride and knowing what is their area and what the contest means to them. They are taking ownership in the contest...”

Another participant aptly summarized the contest preparation process of the majority of advisors in the following manner:

“It is a big time commitment by the advisor and the students. It’s really pretty basic, students need to be familiar with safety standards, must be able to read and comprehend the contest guidelines and successfully write statements for the safety notebook using correct spelling, grammar and punctuation. We also worked with them on public speaking for the interview process...”

Research Question Two

Since all advisors agreed that students needed to know how to read and comprehend to successfully prepare for the SkillsUSA Occupational Health and Safety national competition, the decision was made to specifically examine what, if any, Pennsylvania State Reading Standards align with the contest competencies. Thus, a focus group of eight Pennsylvania career and technical educators were charged with the task of identifying what, if any, of the Pennsylvania State 11th Grade Reading Standards would naturally align with the competition competencies. Table 2 summarizes the naturally aligned reading standards by contest competency category.

Table 2
Naturally Aligned Reading Standards by Focus Group Consensus (N =8)

Competency Categories	Reading Standards	
	1.1.11. G	1.1.11.F
Identify and conduct four health and safety projects which are outlined in the contest guidelines	Demonstrate after reading	Understand the meaning of and
Design a scrapbook that displays four health and/or safety projects completed by the chapter according to contest guidelines	understanding and interpretation of both fiction and nonfiction	applying key vocabulary across the
Organize a scrapbook according to contest guidelines	text, including public documents	various subject areas
Complete an interview with a panel of judges	None Identified	None Identified

The results within Table 2 suggest that (a) two Pennsylvania State 11th Grade Reading standards naturally align with three of the four competition competency categories, and (b) that academic rigor (i.e., via two standards at the 11th grade reading level) appears to be associated with the SkillsUSA Occupational Health and Safety student contest preparation.

Summary, Conclusions and Recommendations

Summary

Career and Technical Student Organizations have been an integral component of CTE since the passage of the Smith-Hughes Act of 1917 (Alfeld et al., 2007; Threeton & Pellock,

2008). Over the last 92 years the scope of CTE has dramatically changed, but the integral relationship between CTE and CTSOs remains. A significant development and current federal priority includes strengthening the academic skills of CTE students by integrating academic instruction (Walter & Gray, 2002). The Carl D. Perkins CTE Improvement Act of 2006 names CTSOs as an integral partner of CTE programs in integrating academic and technical standards. While a recent study has suggested that CTSO competitive events naturally integrate academics into industry based problem scenarios and that these competitive events positively affect grades, academic engagement, SCANS-type academic/job skills, and career self-efficacy in students (Alfeld et al., 2007), little research has been conducted which specifically examines what is required by students in preparation for competitive events.

In order to contribute to this body of knowledge, our study was conducted to determine what students needed to know and do in order to prepare for the SkillsUSA Occupational Health and Safety national contest and to determine if the contest competencies naturally align with any of the Pennsylvania State 11th Grade Academic Standards in order to identify if academic rigor is associated with the contest preparation. The results for question one suggest that students need to: (a) be familiar with the basics of business and industry health and safety, (b) know how to read and comprehend the rules and guidelines of the contest, (c) know how to write using correct spelling grammar and punctuation, (d) realize that preparation for the contest is a time commitment and that time management is key, and (e) know how to speak in public for the interview process. With SkillsUSA contests growing in popularity and becoming increasingly competitive, these findings could be particularly useful to SkillsUSA advisors preparing students for the occupational health and safety competition.

Since all advisors agreed that students needed to know how to read and comprehend to successfully prepare for the SkillsUSA Occupational Health and Safety national competition, the decision was made to specifically examine what, if any, Pennsylvania State Reading Standards align with the contest competencies. The results for question two suggest that (a) two Pennsylvania State 11th Grade Reading standards naturally align with three of the competition competency categories, and (b) that academic rigor (i.e., via two standards at the 11th grade reading level) appears to be associated with the SkillsUSA Occupational Health and Safety student contest preparation. With the integration of academics being a major priority within Career and Technical Education, these findings could be particularly useful to those interested in learning about the natural integration of challenging and rigorous academics via CTSO involvement while simultaneously preparing students for occupational health and safety within the world-of-work.

Conclusions

The SkillsUSA Technical Standards (2008) for the Occupational Health and Safety competition suggest that there is a connection between the contest and the national academic standards in language arts and science, but fail to mention if direct alignment was achieved and the grade level of the connected standards. While this study examined the technical standards utilized by SkillsUSA for 2006, the Occupational Health and Safety competition standards did not significantly change over the years. Thus the results of this study contribute to the body of knowledge regarding the natural alignment and rigor of academic standards (i.e., in reading)

within three contest competency categories, which supports the theoretical foundation of contextual learning and Astin's Theory of Involvement via SkillsUSA competition preparation.

This study provides evidence that the SkillsUSA Occupational Health and Safety competition preparation has the ability to provide students with a "real world" connection in which essential academic skills needed for successful transition to the world-of-work are enhanced. Furthermore, the results indirectly provide evidence that the SkillsUSA Occupational Health and Safety contest is an integral partner of CTE programs in integrating academic and technical standards as is suggested in the Carl D. Perkins CTE Improvement Act of 2006 as two of the nine (22.2%) Pennsylvania 11th grade reading standards referenced to the state assessment test appear to be associated with contest preparation (see table 2).

There are several limitations within this research study. First, while the interview of highly qualified advisors identified valuable information regarding contest preparation, this form of data collection method is self-reporting in nature thus the results are collectively based on opinion. Second, all participants involved with question one and two were CTSO advocates and had knowledge of the study's purpose, thus the results could have been positively skewed. Third, because this was a preliminary investigation, data for question one were coded and the identification of themes and association of a response with a theme were compared and discussed between two individuals (i.e., primary investigator and another experienced researcher) until consensus was reached. While this procedure allowed for consistency within the analysis, it failed to provide multiple perspectives from a variety of individuals with diverse expertise. Thus, future investigations should focus on conducting this method involving a panel of experts, and/or the participants themselves. Fourth, while the focus group consisted of career and technical educators and CTSO advisors with previous experience naturally integrating academic standards within CTE curriculum and instruction, the findings for question two could have been greatly enhanced if traditional academic teachers (i.e., in language arts) were represented. Fifth and finally, while this study did uncover some noteworthy information regarding contest preparation the research methodology was a little unconventional for a qualitative study. However, with little existing research on contest preparation this body of work should be viewed as an innovative study, which encourages further CTSO competition research.

Recommendations

While the results of this study did suggest that academic rigor (i.e., via two standards at the 11th grade reading level) appears to be associated with contest preparation, further research should examine the rigor of both academic and technical standards within multiple competitions and diverse CTSOs. Subsequent contest preparation studies should include a sample of CTSO advisors, CTE instructors and traditional academic teachers (i.e., language arts, math and science) as it has the ability to enhance validity and reliability. It is the recommendation of the authors that all contests within the eight nationally recognized CTSOs be examined to determine if academic rigor is associated with competition involvement and preparation on a larger scale. The results could uncover innovative methods for teaching challenging and rigorous academics in context to students preparing for further education and careers.

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