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Career and Technical Education Research (CTER) is published three times a year and is an official publication of Association for Career and Technical Education Research (ACTER). ACTER was organized in 1966 and strives to: (a) stimulate research and development activities related to career and technical education, (b) stimulate the development of training programs designed to prepare persons for responsibilities in career and technical education research, (c) foster a cooperative effort in research, (d) facilitate the dissemination of research findings and diffusion of knowledge.

Editor's Note

Steven R. Aragon
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A little over two years ago, I was offered and accepted two challenges. The first was to take over as editor of the newly named *Career and Technical Education Research (CTER)* which had a 29 year history as the *Journal of Vocational Education Research (JVER)*. The second was to follow in the footsteps of some outstanding editors, the most recent being Joe Kotrlík. At that time, I was not only faced with maintaining the momentum that Joe had established as editor of the field's top research journal but to also promote the journal under its new name.

As most of you know, that first year was a challenge. The first issue of *CTER* did not "hit the stands" until August (maybe after) of that year – about five months later than expected. We went into '06 thinking that we would be rapidly catching up on the remaining two issues and have the journal back on publication schedule within a few months. However, that did not happen. All three issues of '06 are coming out in '07.

In the beginning, I was concerned about the fact that the issues were not on schedule. After missing a few of the publication deadlines I had set for myself and the *CTER* staff, I finally stopped being bothered. The reason being, the quality of the journal was not being comprised as a result. In fact, I believe it was being strengthened.

When I took over as editor, I made a commitment to myself as well as to the ACTER Board that the manuscripts published in the journal would exemplify the rigor expected from a top-tier journal. As I look back through the issues of the journal that have been published under my editorship, including the current issue, I feel confident in saying that the manuscripts have represented this level of rigor. It is my hope that you, as readers, feel the same.

As I prepare to step down as editor of *CTER* and pass the baton to James Greenan at Purdue, there are several individuals that deserve a word of thanks for helping make this experience a positive and rewarding one. I would like to take this opportunity to publicly recognize them.

The first would be Joe Kotrlík. Joe was responsible for creating the electronic database that allowed me and my staff to effectively manage the submission and review process of each manuscript. He had created all of the various letters we used and had well-defined procedures for each step of the process. He also spent time with me teaching me the ropes of the job.

A big word of thanks goes to all of the reviewers that worked with me and my staff during these past two years. I know the hard work that goes into producing a carefully crafted, thorough, and thoughtful review. Often times, reviewers had to

Alfeld, Hansen, Aragon, & Stone

review manuscripts multiple times. I appreciate your willingness to engage in this lengthy process.

I thoroughly enjoyed working with the Editorial Board. The advice and encouragement was very much appreciated. I especially want to thank Neil Knobloch and Levon Esters for their work as chairs during my time as editor. I could always count on both colleagues to give me helpful and timely advice as well as support my decisions.

I would also like to thank Morgan Lewis and Oscar Aliaga who served as the managing editors during my time as editor. They demonstrated the highest levels of patience when we would send files to them that still had formatting errors. Even though we felt like we had proofed each issue several times and corrected all of the problems, they still had to be sent back to us for further updates.

I thank my department head, Scott Johnson, for the support of a dedicated RA to serve as assistant to the editor. I worked with two great individuals during these two years. It would have been impossible to fulfill my editorial responsibilities without the support of this position.

Finally, my biggest word of thanks goes to Jessica Egan and David Ortner. Jess and Dave served as my assistants during my time as editor. Both were responsible for processing manuscripts which included sending out requests for reviews and receiving completed reviews. Each in their own way, found ways of providing “gentle nudges” to individuals who were late on completing their reviews or formatting. In addition to handing the manuscript review process, they were both in charge of formatting the articles as well as the additional support materials that comprised each issue of the journal. Both Jessica and David took over the day-to-day operations of the journal which made it possible for me to focus specifically on the editorial functions of the journal. Thanks again to you both!!!

As I move into my role as President-Elect of ACTER, I look forward to working with the organization in a different role. My goal as President-Elect and President is to continue to promote rigor in CTE research both through the organization and the journal. I look forward to working with you and to seeing the organization grow!

Inside the Black Box: Exploring the Value Added by Career and Technical Student Organizations to Students' High School Experience

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Abstract

This study explored the hypothesis that Career Technical Student Organizations (CTSOs) provide a variety of experiences that either directly or indirectly affect three important outcomes of secondary education: achievement, transition to postsecondary education and training, and employability. A pre-post-test comparison study of high school students ($n=1797$) in CTE classes that included CTSO classes, CTE classes without a CTSO, and general (non-CTE) classes was conducted over the course of one academic year. Compared to the other groups, CTSO students reported higher levels on a variety of positive behavioral, academic, and psychosocial measures at the start of the year, but they did not report as much gain over the year. More types of participation in CTSOs was associated with greater academic motivation, academic engagement, grades, career self-efficacy, college aspirations, and employability skills. Finally, of four organizational elements of CTSOs, competitions were found to have the most positive effects.

The work reported herein was supported under the National Research Center for Career and Technical Education Program, PR/Award No. VO51A990006 administered by the Office of Vocational and Adult Education, U.S. Department of Education. However, the contents do not necessarily represent the positions or policies of the Office of Vocational and Adult Education or the U.S. Department of Education, and you should not assume endorsement by the Federal Government.

Introduction

Even in the era of *No Child Left Behind*, the dropout rate in American high schools hovers at 30%, on average, and for certain minority groups it is as high as 45% (Swanson, 2004). Research on high school dropouts shows that lack of engagement with the school, both socially and academically, and lack of personal relationships with adults are among the top reasons for student dropout (Anderman & Freeman, 2004; Arroyo, Rhoad, & Drew, 1999; National Research Council, 2004; Somers & Piliawsky, 2004). Efforts at reducing the dropout rate have included early interventions, mentoring, alternative schooling, after-school programs, and individualized instruction (Arroyo et al., 1999; Smink & Schargel, 2004).

Extracurricular activities seem especially beneficial to students at-risk for dropout. A study by Mahoney, Cairns, and Farmer (2003) found that consistent extracurricular participation in adolescence was linked to higher educational status in young adulthood, which was in turn linked to interpersonal competence. Mahoney and Cairns (1997) found that those who participated in extracurricular activities had lower rates of high school dropout, and both Camp (1990; Camp et al., 2000) and Guest and Schneider (2003) found that students' academic achievement is enhanced by participation in extracurricular activities.¹

Recent research has shown that career and technical education (CTE), which is co-curricular rather than extra-curricular, has been found to play a role in keeping youth in school (e.g., Plank, 2001; Plank, Deluca, & Estacion, 2005). CTE courses can help students stay engaged in school by exposing them to skills that are directly applicable in the "real world" (Barns & Erickson, 2001; Bransford, Brown & Cocking, 2000; Stone & Alfeld, 2004). More than 95% of high school students participate in some form of CTE, including coursework, work-based learning (WBL), and career pathways (Levesque, 2003). Despite "vocational" education's traditional stigma, it has recently been shown that academic skills can be enhanced in CTE content courses (Stone, Alfeld, Pearson, Lewis, & Jensen, 2006). Indeed, offering more, and more rigorous, CTE courses is one way that schools can provide more authentic instruction, which has been recommended as a strategy for enhancing student learning (Newman & Wehlage, 1995).

Many CTE programs also include student organizations (Scott & Sarkees-Wircenski, 2004) targeted towards more intense involvement in a particular field (e.g., business and marketing; health). Career and Technical Student Organizations (CTSOs) help students explore career paths, prepare youth to become productive citizens and assume leadership roles in their communities (Reese, 2003). However, there has not been as much research conducted on the effects of CTSOs, as opposed to academic or out-of-school activities, on young people's development. This project seeks to better understand whether and how high school students benefit from

¹ On the other hand, Hunt (2005), in a longitudinal study, found that it is good grades that lead to greater extracurricular involvement rather than the other way around.

participating in career and technical student organizations.

Organizational Elements of CTSOs

We believe that CTSOs provide four distinctive kinds of experiences for high school students who participate: (1) leadership, (2) professional development, (3) competitions, and (4) community service. As will be explained in the hypothesis section, we believe that these organizational elements of CTSOs produce beneficial effects on students by reinforcing the learning that took place in the CTE course, and by providing an opportunity to put this learning into practice. For the purpose of this study, we focus on what CTSOs add to CTE above and beyond the usual emphases of CTE, which include career pathways or career academies, tech prep, and work-based learning activities (e.g., cooperative education, job shadowing, mentoring, school-based enterprise, and internship/apprenticeship). All of these CTE-related activities are thought to help students form career identities and give them the professional and work skills they need to launch their careers. Because all CTE programs offer these, whether or not they offer a CTSO, this study examines the benefits provided by the distinctive organizational elements of CTSOs. We will now describe these four elements more fully.

Within CTSOs, there are many opportunities for students' *leadership development*, including becoming an officer at the local, regional, or national level. In a study of past FFA participation in the role of community leadership development, Brannon, Holley, and Key (1989) found that former FFA members had an impact on the development and success of community leaders. Dormody and Seavers (1994) found that participation in FFA leadership activities predicted the leadership life skill development of members, and a follow-up study by Wingenbach and Kahler (1997) supported these findings.

Competitive events serve to test both technical and non-technical job-related competencies. Many of these events integrate academic knowledge into industry-developed problem scenarios. Preparation for the competitive events provides hands-on experience in different trade, technical and leadership fields; develops job-related technical skills and competencies; offers recognition to participants; and serves to ensure business and industry involvement in career and technical education programs. In fact, contests are often run with the help of industry, trade associations, and labor organizations, and test competencies are set and judged by industry. Blakely, Holschuh, Seefeldt, Shinn, Smith, and Vaughn (1993), in a study of the perceived value of FFA contests by students and adults, found that students listed teamwork, responsibility for a project, learning an area of knowledge, competing with others, talking in front of people, learning a specific skill and learning to win in descending order.

It is generally assumed that both the content of the CTE program and the skills and experiences acquired in the CTSO contribute to *professional development*

(the acquisition of knowledge and competencies that will be useful for future work in the profession). Most CTSOs provide structured professional development activities for their members, including guest speakers, workshops, and conferences. There has been little research on this aspect of CTSOs, but one study found that SkillsUSA members' perceptions of their level of personal/professional development increased as their participation in SkillsUSA increased (Gordon, Yocke & Bess, 1995).

Finally, many CTSO members engage in some form of *community involvement*, such as volunteering in community service activities, but this element of the CTSO experience has been the most ignored in research studies, and much evidence that is presented is anecdotal.

Problem and Purpose

In sum, many elements of CTSOs are thought to have positive effects on students (Brown, 2002). However, little research exists to support the claims of these organizations of the benefits to their members (Lankard, 1996; Zirkle & Connors, 2003). The handful of studies over the past 25 years that examined the various effects of participation in CTSOs on students were all conducted on individual CTSOs; none gathered data from all eight. In addition, only a few specifically addressed the role of CTSO participation in developing technical and employability skills. To date, there has been no large scale, comprehensive study that examines the immediate or long-term benefits of participation in CTSOs with respect to the development and assessment of employability skills or other indicators of student success, such as achievement and post-high school pathways (Camp et al., 2000; National Dissemination Center for Career and Technical Education, 2002; Zirkle & Connors, 2003).

We sought to remedy this situation by conducting a study that would fill in some of the gaps in the research. In this large, quasi-experimental research project using a nonequivalent control-group design (Gall, Gall, & Borg 1999, p. 402), we surveyed students and teachers in all eight of the CTSOs across multiple states in the fall and the spring of one academic year, and we collected similar data from two comparison groups. While each CTSO has its own content, procedures, and priorities, we believe that CTSOs as a whole are distinctive enough from other school and non-school activities that, when compared to non-CTSO members, participation may produce similar benefits for students across the different CTSOs.

Our hypotheses, which were guided by the literature and discussions with national CTSO directors, were as follows: CTSOs provide four distinctive kinds of experiences for high school students who participate: leadership, professional development, competitions, and community service. These *organizational elements*, in turn, impact important high school achievement and transition outcomes. We expected that there would be effects on achievement and psychosocial variables that have been linked with achievement in previous education research. We hypothesized

specifically that high school CTE students who participate in CTSOs would show significant advantages on these variables (1) over students in CTE programs that do not offer a CTSO and (2) over comparable students who are not in CTE.

Research Questions

This study is designed to look into the “black box” of CTSOs and test the many assumptions and claims about their value. We focus on the links between participation in a CTSO and both psychosocial (motivation, academic engagement, civic engagement) and achievement (career self-efficacy, grades, employability skills, college aspirations) outcomes; the latter set of variables may indicate potential post high school success. Our theoretical model (see Figure 1) posits that CTSO membership will positively affect these outcomes. We ask: “To what extent do CTSOs affect important aspects of the high school experience (above and beyond stand-alone CTE programs)?” Specifically, three specific research questions are of interest:

- 1) Is CTSO membership over one academic year associated with an increase in positive outcomes compared to non-CTSO students (CTE-without-CTSO and general classes)?
- 2) Is the degree of involvement in the activities of a CTSO over one academic year associated with increases in CTSO students’ positive outcomes?
- 3) Which organizational elements of CTSOs (leadership, professional development, community service, and/or competitive activities) are associated with increases in CTSO students’ positive outcomes?

Based on the findings from our literature review, including the anecdotal claims made by CTSOs and their members, we expect to find support for our hypotheses that students who participate in CTE classes with a CTSO component will have higher levels of motivation, academic and civic engagement, career self-efficacy, employability skills, grades, and college aspirations compared both (a) with students in CTE classes without a CTSO component and (b) with non-CTE students.

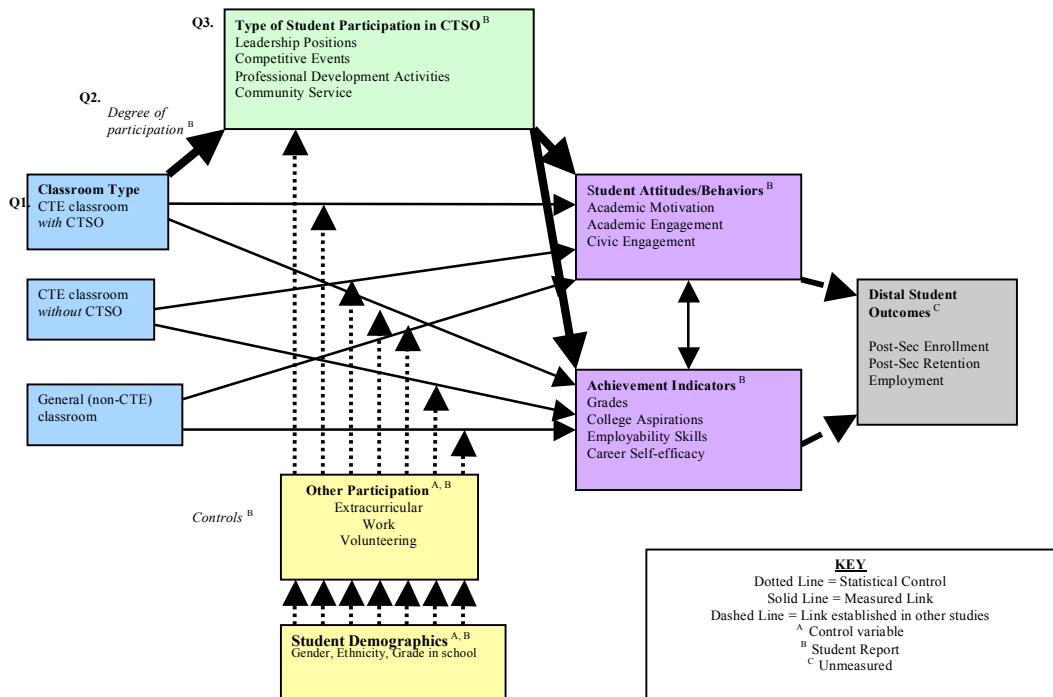


Figure 1. Theoretical Model of the Effect of CTSOs on High School Students

Student Variables

The following is a discussion of the specific student variables that we hypothesize will be affected by participation in a CTSO. *Academic motivation* is predictor of educational persistence (Wigfield & Eccles, 2002). Contexts that motivate students to learn are those (1) that offer interesting, challenging, and meaningful tasks and activities; (2) where teachers help students develop effective learning and problem-solving strategies, foster an environment that rewards effort without punishing mistakes, and provide feedback about progress; and (3) where both teachers and peers support learning and have mutual respect for each other (see Perry, Turner & Meyer, 2006).

A comprehensive review of the classroom *engagement* literature concluded that peer learning communities, authentic instruction, and classrooms that support autonomy (among other factors) can facilitate students' academic engagement (Fredricks, Blumenfeld, & Paris, 2004). According to the developers of the National

Study of Student Engagement (NSSE, 2004, 2005, 2006), the time and energy students devote to educationally purposeful activities is the single best predictor of their learning and personal development. The National Academy of Sciences, in the report, *Breaking Ranks II* (NAS, 2004), suggests that engaging youth and fostering achievement include providing opportunities to use school learning in improving both their own lives and other lives in their communities. Due to their co-curricular nature, CTSOs offer students the opportunity to apply knowledge and skills from their academic lessons directly to real world situations, which is what Newmann, Secada and Wehlage (1995) describe in their guidelines for authentic learning.

While there has been a revival of the research on *civic engagement* in recent years, there is not yet a single definition of it in the literature. Other terms include citizenship, service learning, political attitudes, patriotism, community service, social responsibility, and volunteering. In a review of research articles on service learning, Billig (2002) demonstrated that it produces measurable increases in students' academic achievement, personal and social development, civic responsibility, and career awareness. Camino and Zeldin (2002) documented the importance of responsibility and leadership that community service can provide, and Stott and Jackson (2005) found that students who engaged in service learning reported improvement in personal awareness, social skills, learning skills, career interest, and character education.

Employability Skills include workplace basics such as knowing how to learn; reading, writing, and computation; communicating effectively; creative thinking and problem-solving; personal management; group effectiveness; and influencing others (NCCVSO, 1990). Employers report that employees who have a better understanding of workplace skills are more prepared for changes in workplace requirements (Wills, 1995). The federal government has taken steps towards officially identifying these skills (e.g. forming the Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, 1992; National Skill Standards Board (NSSB) established by Congress in 1994, Bailey & Merritt, 1995).

Self-efficacy is a person's belief in his/her competency to perform well and has been linked empirically to persistence and achievement behaviors (Bandura, 1986, 1989; Schunk, 1989, 1991). Self-efficacy beliefs are expectations for performance (Graham & Weiner, 1996) and are usually measured using scales that focus on specific situations and tasks (Betz & Hackett, 2006). Individuals with high self-efficacy have been shown to exert more effort in the face of difficulty and to persist longer (Pintrich & Schunk, 1996). Self-efficacy for finding and pursuing a career pathway for oneself is a valued outcome of high school CTE (ACTE, 2006). Through various activities in a career-related domain, CTSOs may help students develop skills and confidence for successful and satisfactory job-seeking.

Grades in school are one of the most important indicators of student success and potential for further achievement. Colleges rely on high school student

applicants' grade point averages (GPA) to predict their ability to complete postsecondary education, and employers use applicant's GPA to judge applicants' likely success on the job.

Researchers have demonstrated that *college aspirations* are shaped by forces in students' family, peer, and school environments. Decades of prior research has shown that family background factors play the largest role in determining educational attainment (Erikson & Goldthorpe, 1993), but aside from demographic characteristics, student psychosocial and behavioral variable have also been shown to affect educational achievement and future plans (Eccles et al., 1983). Although extracurricular activities have not been found to affect grades or college aspirations (Hunt, 2005), experience in a career-oriented activity such as a CTSO may influence an individuals' educational goals.

In sum, we hypothesize that participation in a CTSO will affect students' achievement motivation, academic engagement, civic engagement, career self-efficacy, employability skills, grades, and college aspirations. Though we do not measure more distal outcomes, the variables that we do measure have been shown in other research to be linked to success in postsecondary and employment (refer again to Figure 1). Because other non-school activities can also provide the benefits that CTSOs claim, it is important to measure and control for these variables in any analysis of the impact of CTSOs. The most popular activities are extracurricular activities, volunteering, and part-time work; because they are not a focus of this study, we do not describe them here (for a more complete literature review, see Alfeld et al., forthcoming).

Methods

Design

Our design was a four group, cross sectional, pre-test/post-test design for one academic year (2004-2005). Group [1] was comprised of CTE students in an active CTSO. Group [2] included students in a CTE program without a CTSO. Groups [3] and [4] were non-CTE students from each of the schools from which the first two groups were drawn and functioned as "controls" or "counterfactuals," as shown in Table 1 below.

Table 1. Sample Design

	CTE Classrooms	Non-CTE Classrooms
CTSO schools	[1] With CTSO (n=27 classrooms)	→ [3] General Students (n=27 classrooms)
Non-CTSO schools	[2] Without CTSO (n=22 classrooms)	→ [4] General Students (n=22 classrooms)

For analytical purposes, however, we used only three groups to make two comparisons, as depicted in Figure 2: (1) CTE-with-CTSO classrooms compared to CTE-without-CTSO classrooms and (b) CTE-with-CTSO classrooms compared to *all* general classrooms. The two groups of general comparison classrooms were aggregated to ensure that this counterfactual group was as representative of students in the general population as possible. Thus, there were three groups used for analysis: [1] CTE with CTSO (referred to hereafter simply as “CTSO”), [2] CTE without CTSO (referred to hereafter simply as “CTE”), and general ([3]+[4]).

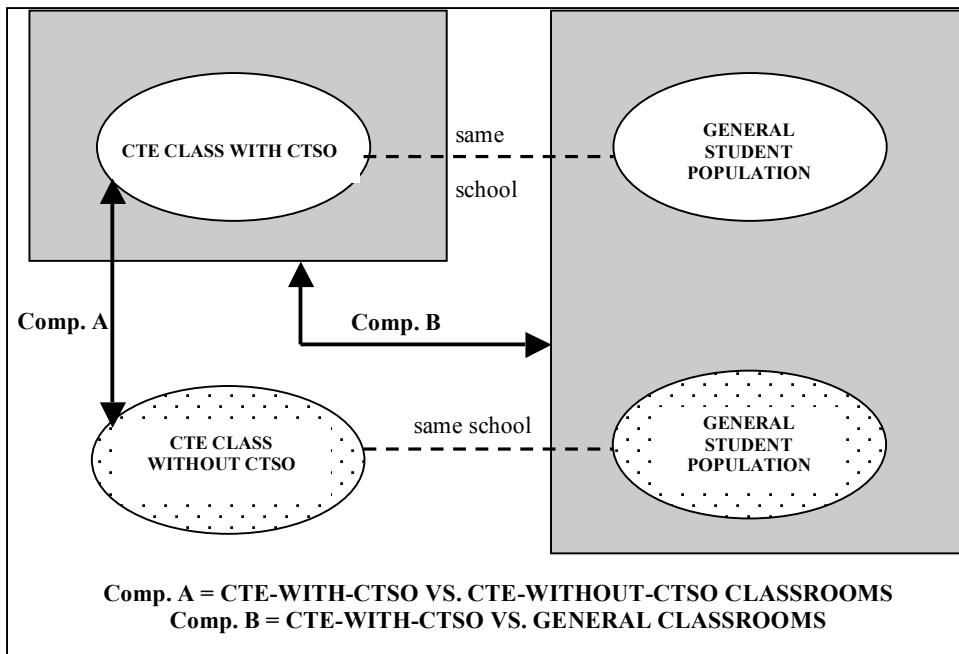


Figure 2: Quasi-experimental Design Comparisons

Sample

We recruited the Group 1 (CTSO) schools with the help of national organizations of CTSOs. Group 2 (CTE) schools were recruited with the help of state directors of CTE in each of the states in which we conducted the study: Ohio, Illinois, Oklahoma, Kentucky, Tennessee, Missouri, Georgia, California, Texas, and Minnesota. We made sure that the CTE classrooms did not have a CTSO at their school at all so that the voluntary nature of CTSO membership did not confound the results. Each of the eight CTSOs was studied in at least 2 states. We were able to recruit 27 CTSO classrooms and 22 CTE classrooms.

Groups 3 and 4 (general, or non-CTE, classrooms) were recruited through

the Groups 1 and 2 teachers, respectively, as follows: Both CTSO and CTE teachers were asked to find (1) another teacher in their school who taught a general course such as English or social studies who would also agree to take part in the study as a comparison classroom, and (2) someone in the school such as a counselor to act as a "liaison" -- a neutral third party who would administer the surveys in both the CTE and the general classrooms. Comparison classrooms in the "general" group were primarily academic subjects (e.g., English, social studies) but not necessarily high-level ones; the important criterion was that they were not a CTE class.²

Liaisons' responsibilities included distributing and collecting consent forms from students (parents were sent consent forms to return only if they did *not* want their child to participate in the survey); assigning ID numbers to students; keeping a confidential master key between Fall and Spring; ensuring that students used the same ID on their Fall and Spring surveys; and returning all of the materials to the researchers. In return for their cooperation, each liaison was sent their preference of either a \$50 check or \$50 Wal-mart gift card after each survey administration (once in the Fall and once in the Spring); teachers (CTE, CTSO, and general) were each given their preference of a \$25 check or Wal-mart gift card; and participating students were each given a \$5 Wal-mart gift card for each administration of the survey.³

Measures/Instrumentation

Surveys were administered in the fall of 2004 and spring of 2005. Identical questions were asked to each group at each time point. General and CTE student surveys were similar, asking about the class they were in while taking the survey. The CTSO student survey asked additional questions about the CTSO activities. Further, because there were 8 different CTSOs, the wording of the CTSO-specific questions differed slightly due to different terminology for activities in each of the organizations. All survey items relate directly to the theoretical model (Figure 1).

The student questionnaire was developed using items and scales from various sources. Items regarding level (e.g., local, regional, national) and type (e.g., elected leader, committee member) of participation in CTSO activities, as well as participation in other activities (e.g., sports, 4-H), were taken from Connors and Swan's (2001) Youth Participation in Leadership Activities Questionnaire.

² All students were asked not to take the survey again if they had taken it in another class, so that the samples remained independent.

³ Due to school regulations, we could not compensate all students with cash. Wal-mart was chosen because it was the most ubiquitous chain across all of our research sites that offered the most individual choice of compensation (as opposed to a food-only chain such as McDonald's).

Items for the employability scales were adapted from the Youth Experience Survey (YES, 2.0; Hansen & Larson, 2005). The YES was designed to survey high school aged youth about their experiences in organized youth activities (e.g., CTSO) within six domains of development (Hansen, Larson, & Dworkin, 2003). For the present study, items from the YES were selected to focus on students' *employability* experiences in a CTSO classroom. The selected items came from four of the six domains: initiative (6 items), prosocial norms (3 items), teamwork and social skills (5 items), and cognitive skills (4 items).

The academic engagement scale was adapted from and in collaboration with the High School Survey of Student Engagement (HSSSE; Indiana University); as mentioned earlier, it is based on the college version called the National Survey of Student Engagement (NSSE). The academic motivation scale is the college student version (as opposed to the elementary school version) of the Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich, Smith, Garcia, and McKeachie (1991). The civic engagement scale is adapted from the Civic Responsibility Survey developed at the Service-Learning Research and Development Center, University of California at Berkeley (Furco, Muller, & Ammon, 1998); and the self-esteem scale is the ASDQII developed by Herb Marsh (1999). All measures were used with the permission of the authors.

Students' college aspirations were measured by asking the students how far they expect to go in school; responses could range from "less than high school" to "doctoral degree" (c.f., NELS:88; Mortimer, 2003). Grades were students' self reports of what grades they receive (e.g., mostly A's; A's and B's; B's, etc.). The career self-efficacy scale is that of Betz, Klein, and Taylor (1996).

Extracurricular participation is the sum of the possible extra curricular activities that students could participate in (e.g., athletics, boy/girl scouts, chess club). Volunteer and part-time work hours were measured by asking students how much time they spend in each type of activity. For CTSO participants, activities in each of the four hypothesized organizational elements (leadership, competition, professional development, and community service) in which students could participate were summed across levels (local, regional, national) at which they participated. For example, a student's leadership score could range from 0 (no participation at any level) to 25 (participation in all possible leadership activities at all levels).⁴

Surveys were developed in the spring of 2004 and piloted at DECA's spring conference. Feedback from student focus groups after pilot testing an early survey draft suggested eliminating scale items that students found repetitive and redundant. Shortened surveys were again piloted, this time at SkillsUSA's summer 2004 conference, and scale reliabilities were acceptable (α s > .80).

⁴ The maximum varied across each of the four organizational elements (leadership, competitions, etc); see Table 8.

Results

Of the 2485 students who took the Fall 2004 survey, 1797 of these participated again in the Spring 2005 survey. Thus, there was a 72% retention rate. Students who took the survey in both the fall and spring did not differ from those who only took the survey at one time point on demographics or on key measures. Nevertheless, we limited our analyses for this report to those students who had participated in both Fall and Spring to get an accurate measure of the effects of a full academic year.

Descriptives

The sample comprised mostly juniors/seniors (72% in general, 66% in CTE, and 78% in CTSO classes). The general and CTSO classes had 55% and 53% female students, respectively, whereas the CTE classes were 48% female. The sample was primarily white across all three types of classrooms (90% in CTE and CTSO classes, 87% in general classes). CTE and CTSO students reported earning more As and fewer Bs than did general students, while general students report receiving more Ds than the CTE and CTSO students. CTSO students reported the highest participation, followed by general students and CTE students, in extracurricular activities (not including anything CTSO-related). Fewer CTSO students (19% compared to 36% and 45%) reported volunteering 0 hours per week, while more CTSO students (7%, compared to 3% and 4%) checked the “more than 10 hours per week” category. Almost twice as many CTE and CTSO (both approx. 20%) as general (approx. 10%) students reported working for pay more than 20 hours per week.

In terms of the outcome variables in our study, Table 2a shows means on each of the measured characteristics in the Fall, by group, and Table 2b shows the Spring means. CTSO students appear to be slightly higher on all measures.

	Means (Fall)			Scale
	General class	CTE class	CTSO class	
Academic Engagement	2.53	2.49	2.62	1-4
Academic Motivation	3.68	3.69	3.72	1-5
Civic Engagement	3.89	3.72	3.97	1-5
Career Self-Efficacy	3.90	3.88	3.93	1-5
Employability Skills	2.38	1.84	2.43	1-4

Table 2b.

	Means (Spring)			Scale
	General class	CTE class	CTSO class	
Academic Engagement	2.54	2.52	2.62	1-4
Academic Motivation	3.42	3.43	3.51	1-5
Civic Engagement	3.92	3.87	3.95	1-5
Career Self-Efficacy	3.89	3.69	3.89	1-5
Employability Skills	2.47	1.80	2.48	1-4

Table 3 shows average levels of CTSO students' participation in each of the four organizational elements (CTE and general students were not asked these questions). It should be noted that the range of responses varied quite a bit across the types of activities (the maximum ranged from 3 types of community service participation to 6 types of leadership and professional development participation).

Table 3. CTSO Participation

	Means (Spring)			Min.-Max. Reported
	General class	CTE class	CTSO class	
# Leadership Activities ¹	N/A	N/A	.94	0-6
# Competitive Activities	N/A	N/A	.72	0-5
# Prof. Devel. Activities	N/A	N/A	.60	0-6
# Community Service Activities	N/A	N/A	.28	0-3

¹All CTSO activity participation was reported in the Spring about the past year.

Hierarchical Linear Models

The analyses will follow the order of the research questions in testing our theoretical model. As was explained earlier, we hold potential confounding variables (volunteering, part-time work, and extracurricular participation) constant in the statistical models. In addition, to eliminate other possible confounds and examine the experience for the average high school student, we also control for gender, race/ethnicity, and grade in school.

Research Question #1 Hierarchical Linear Modeling (HLM; Bryk & Raudenbush, 1992) software was used because of the nested nature of the data: students within classrooms. The HLM analyses were conducted in the order of the research questions. The first analysis (Table 4a) shows the results for academic motivation, academic engagement, civic engagement, college aspirations, grades, career self-efficacy, and employability skills (i.e., results of seven separate models shown in one table). The first model (first set of results in rows in Table 4a) includes only the controls for gender (female/male), ethnicity (white/non-white), grade in school, extracurricular involvement, hours spent volunteering, and hours spent working per week. The second model (second set of rows in Table 4a labeled Model 2) includes these control variables and *adds group membership* (CTSO vs. CTE) to detect whether this makes a difference above and beyond the controls, as hypothesized.

Table 4a. Comparison of CTSO and CTE participation on Student Outcomes

	Academic Motivation	Academic Engagement	Civic Engagement	GPA	Career Self-Efficacy	College Aspirations	Employability Skills	
	β	SE	β	SE	β	SE	β	SE
Model 1 (controls)								
Intercept	1.72***	0.261	1.02***	0.203	1.26***	0.247	1.95***	0.384
Slope	0.45***	0.072	0.54***	0.081	0.58***	0.067	0.62***	0.048
Model 2 (Group)								
Intercept	0.604 ^t	0.303	0.4945*	0.228	0.850*	0.337	0.140	0.444
Slope (1=CTSO 0=CTE)	-0.161 ^t	0.086	-0.202*	0.094	-0.226*	0.085	-0.046	0.060
Control Variables								
Female	0.089*	0.035	0.069*	0.031	0.149*	0.058	0.348**	0.088
White	-0.003	0.042	-0.024	0.043	-0.043	0.084	-0.038	0.140
Grade	0.001	0.017	0.018	0.015	0.001	0.033	0.117**	0.042
Extracurricular Involvement	-0.000	0.008	0.003	0.006	0.022**	0.007	0.032**	0.009
Volunteering Hours	0.047**	0.014	0.044	0.018	0.112**	0.031	0.052	0.042
Job Weekly Hours	-0.019	0.011	0.006	0.012	-0.024	0.026	0.008	0.032
Model 1 ^t variance	0.220		0.207		0.712		1.338	0.314
							2.032	0.308

Results show that students in CTSO classes started out with higher motivation (indicated by a significantly positive intercept in Model 2) and gained slightly less (indicated by a negative slope) compared with students in CTE classes that did not include a CTSO component. Figures 3-7 show that the pattern was the same, though more significant, for academic engagement, civic engagement, career self-efficacy, and employability skills (except that the group difference in gain was not significant for employability skills⁵). There were no differences between groups in either GPA or college aspirations at the start of the study, and no significant change over the year (see Figures 8 and 9 for a graphic representation of these results).

Table 4b replicates the previous set of analyses but uses CTSO vs. general classroom as the group membership variable. This comparison (again, in Model 2) shows that being in a CTSO is associated with higher career self-efficacy at the start of the year and significantly less gain over the course of the year compared with general students (i.e., though both groups increased, CTSO students increased less than general students). In addition, although they started out at the same level, CTSO students' aspirations increased less than did general students' over the course of the year. The pattern was the same, though less significant, for civic engagement. Other differences were not statistically significant. Refer again to Figures 3-9.

⁵ Likely due to an unusually low N for CTE students on the employability skills scale (there was a page missing in some of the surveys sent to this group).

Table 4b. Comparison of CTSO and general education on Student Outcomes

	Academic Motivation				Academic Engagement				GPA				Career Self Efficacy				College Aspirations				Employability Skills			
	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE		
Model 1 (controls)																								
Intercept	2.30***	0.171	1.24***	0.126	1.54***	0.191	2.31***	0.423	1.687 ***	0.192	3.86***	0.312	1.16***	0.108										
Slope	0.29***	0.045	0.40***	0.054	0.49***	0.053	0.59***	0.060	0.509***	0.049	0.46***	0.050	0.40***	0.051										
Model 2 (Group)																								
Intercept	0.011	0.250	0.187	0.181	0.465	0.309	0.079	0.634	0.934**	0.292	0.200	0.501	0.104	0.213										
Slope (1=CTSO 0=GEN)	0.013	0.068	-0.073	0.074	-0.141 ^t	0.075	-0.008	0.091	-0.245**	0.074	-0.25**	0.088	-0.095	0.086										
Control Variables																								
Female	0.042 ^t	0.025	0.023	0.027	0.047	0.041	0.169**	0.064	-0.023	0.031	0.136 ^t	0.078	0.016	0.035										
White	-0.003	0.037	-0.002	0.033	-0.026	0.069	-0.064	0.097	-0.030	0.044	-0.42**	0.131	-0.067	0.041										
Grade	-0.003	0.018	0.011	0.015	0.004	0.030	0.046	0.045	0.012	0.017	-0.023	0.064	-0.015	0.020										
Extracurricular Involvement	-0.002	0.003	0.009 ^t	0.006	0.023***	0.006	0.022***	0.008	0.009***	0.003	0.052***	0.012	0.022**	0.004										
Volunteering	Weekly	0.037**	0.013	0.086**	0.015	0.152***	0.024	0.027	0.032	0.065***	0.015	0.120***	0.043	0.097**	0.014									
Hours	-0.005	0.010	0.023*	0.010	-0.005	0.021	0.025	0.025	0.029*	0.013	0.010	0.036	0.047**	0.015										
Job Weekly Hours																								
Model 1^t																								
Model 1 variance	0.183	0.200	0.646		1.173		0.270		1.882		0.250													
Model 2																								
Model 2 variance	0.183	0.200	0.646		1.172		0.270		1.892		0.249													

^t Model 1 intercept is fall predicting spring with all control variables; Model 2 the membership predictor was added to Model 1
^t p < .10, * p < .05, ** p < .01, *** p < .001

Thus, the answer to the first research question is that membership in a CTSO is associated with higher levels of many of the outcome variables of interest at the start of the year (Fall survey), which may account for why this group gains less than students in the other groups over the course of the academic year. It should be kept in mind that because possible confounding variables (e.g., participation in extracurricular activities) were controlled, the effects we found can be uniquely attributed to participation in a CTSO.

Fig. 3. Academic Motivation

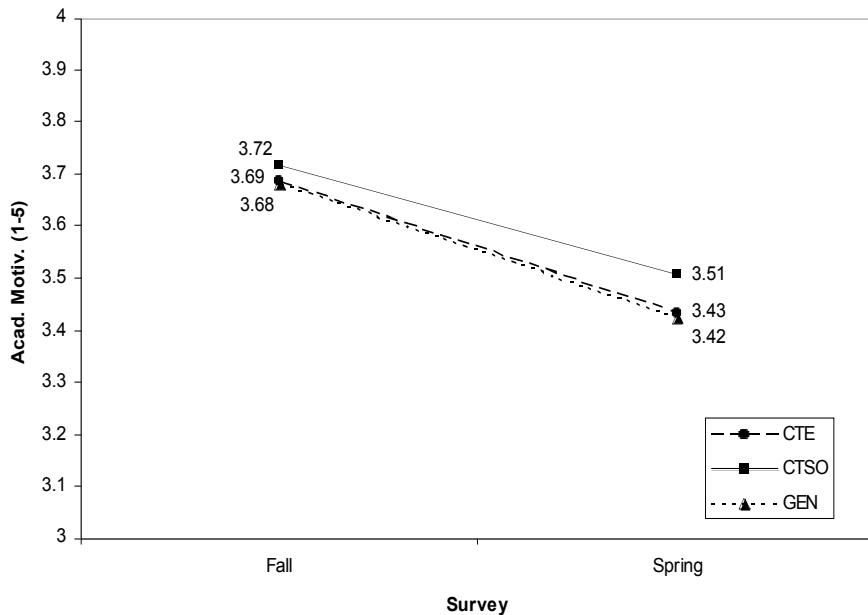


Fig. 4. Academic Engagement

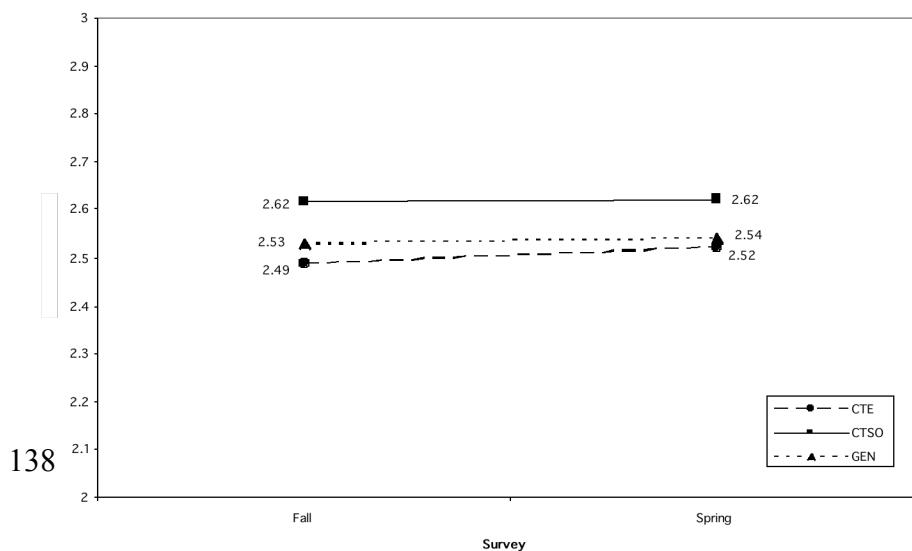


Fig. 5. Civic Engagement

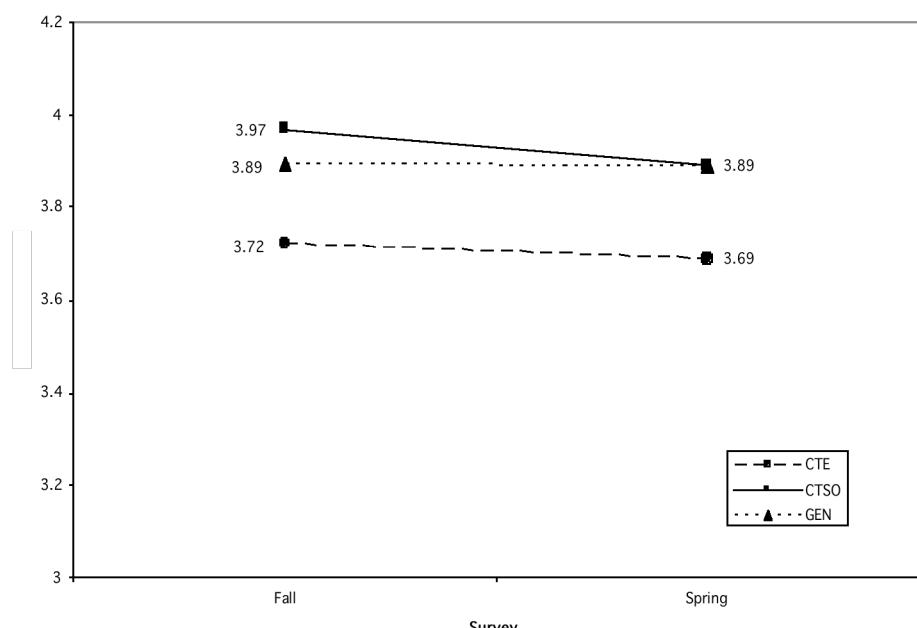


Fig. 6. Grades

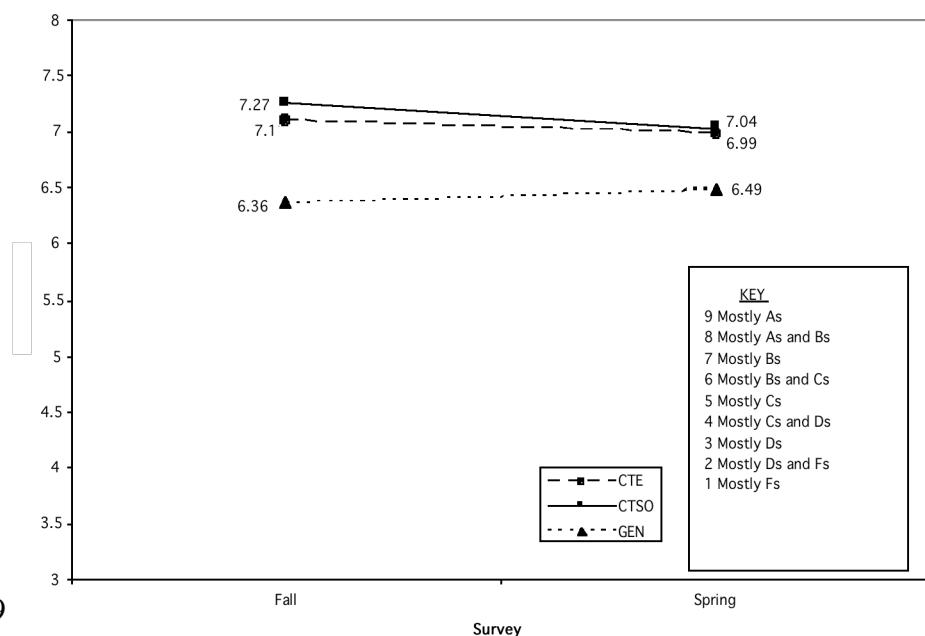


Fig. 7. Career Self-Efficacy

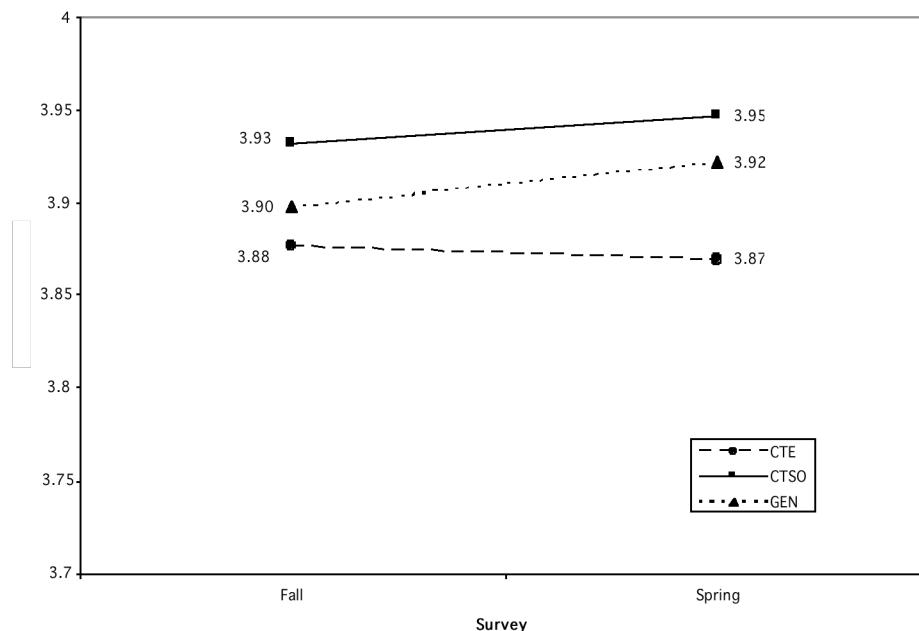


Fig. 8. College Aspirations

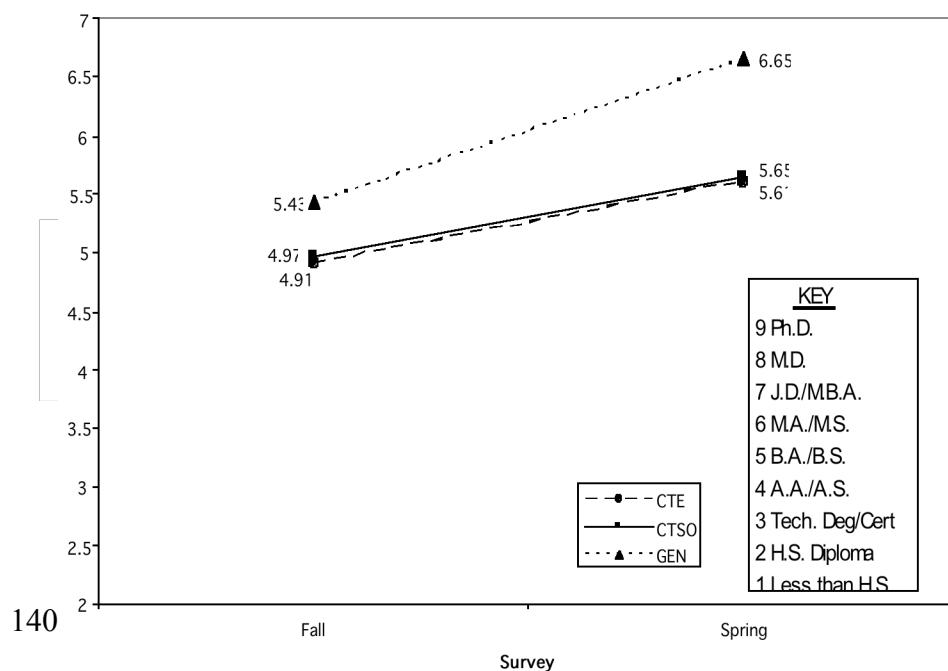
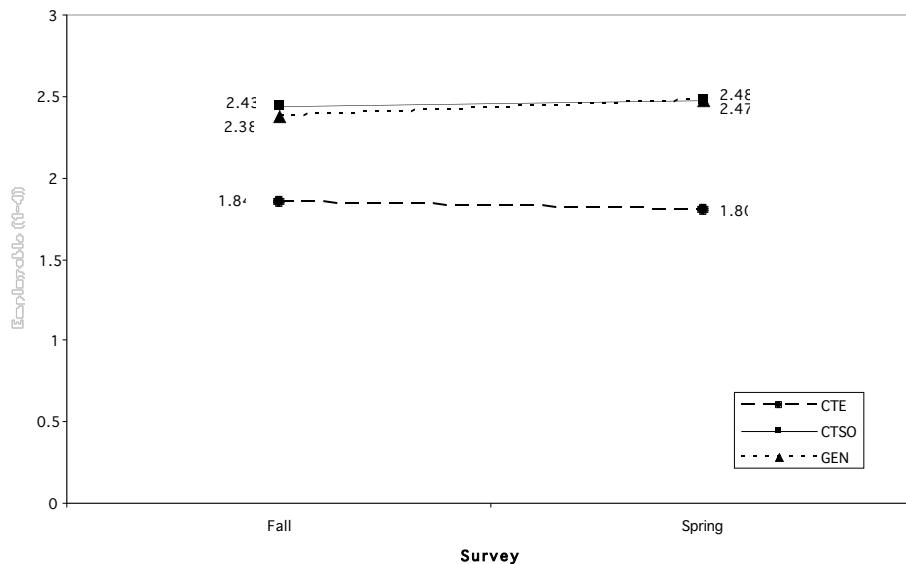


Fig. 9. Employability Skills

Research Question #2 The second analysis examines changes in the outcome variables due to *amount of participation* in CTSO activities. This means that only the CTSO student data were used, since students in the other two groups did not answer questions regarding participation in CTSO activities. In Table 5, the same controls as in the previous analyses were used for the first model, while a continuous variable indicating the amount of participation was entered in the second model as the variable of interest. Table 5 shows that the more a student is involved in a CTSO, the higher their academic motivation, academic engagement, grades, career self-efficacy, college aspirations, and employability skills (greater participation does not affect civic engagement). Thus, the answer to the second research question is that the amount of CTSO participation does make a difference (i.e., the more the better).

Table 5. Change in Outcomes Associated with CTSO Students' Amount of Participation in CTSO Activities

	Academic Motivation		Academic Engage		Civic Engagement		GPA		Career Self Efficacy		College Aspirations		Employability Skills		
	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	
Intercept	2.42***	0.201	1.51***	0.136	2.27***	0.294	2.39***	0.525	2.711***	0.208	3.99***	0.544	1.19***	0.096	
Slope	0.29***	0.049	0.03***	0.006	0.36***	0.058	0.55***	0.065	0.250***	0.054	0.199*	0.076	0.38***	0.042	
Amount of Participation	CTSO	0.018*	0.007	0.32***	0.061	0.017	0.012	0.035*	0.018	0.021**	0.007	0.054*	0.024	0.025***	0.008
Control Variables															
Female	0.068	0.043	0.038	0.038	0.060	0.059	0.360**	0.109	0.054	0.057	0.031	0.119	-0.001	0.036	
White	<-0.001	0.067	-0.023	0.049	-0.121	0.106	0.076	0.176	-0.064	0.092	-0.236	0.238	-0.076 ^t	0.040	
Grade	<-0.001	0.026	0.024	0.019	0.019	0.047	0.059	0.065	0.036	0.026	<-0.001	0.101	-0.016	0.024	
Extracurricular Involvement	-0.007	0.005	-0.002	0.007	0.016	0.008	0.026**	0.012	0.001	0.004	0.050**	0.018	0.018***	0.004	
Volunteering Hours	Weekly	0.033	0.021	0.054**	0.020	0.108***	0.037	<-0.001	0.055	0.032	0.027	0.125	0.078	0.090**	0.013
Job Weekly Hours		-0.034*	0.016	0.002	0.011	-0.062	0.035	-0.015	0.043	0.019	0.023	-0.039	0.044	0.041**	0.015
Total Variance		0.217		0.208		0.704		1.403		0.326		2.075		0.247	

^t p < .10, * p < .05, ** p < .01, *** p < .001

Research Question #3 The third research question examined change in the outcome variables due to participation in the four different *types* of CTSO activities. Again, only the CTSO student data were used, since students in the other two groups did not respond to CTSO-related questions. As in previous analyses, demographic and time use variables were controlled in the first model; and in the second model the *type of CTSO activity* (leadership positions, professional development, competitive events, and community service) was entered. Table 6 shows that, surprisingly, having a leadership position(s) in the CTSO did *not* significantly affect any of the outcome variables. However, participating in competitive events had significantly positive affects on academic engagement and career self-efficacy. There was also a slight positive effect of competitive events on grades, college aspirations, and employability skills. Participation in community service activities also increased students' career self-efficacy, while professional development activities increased students' employability skills. Oddly, professional development activities tended to decrease students' career self-efficacy. None of the four types of CTSO activities (organizational elements) had an effect on academic motivation or civic engagement. Thus, the answer to the third research question is that participation in three of the four types of CTSO activities has a positive impact on students, but these vary by activity (see Figure 10).

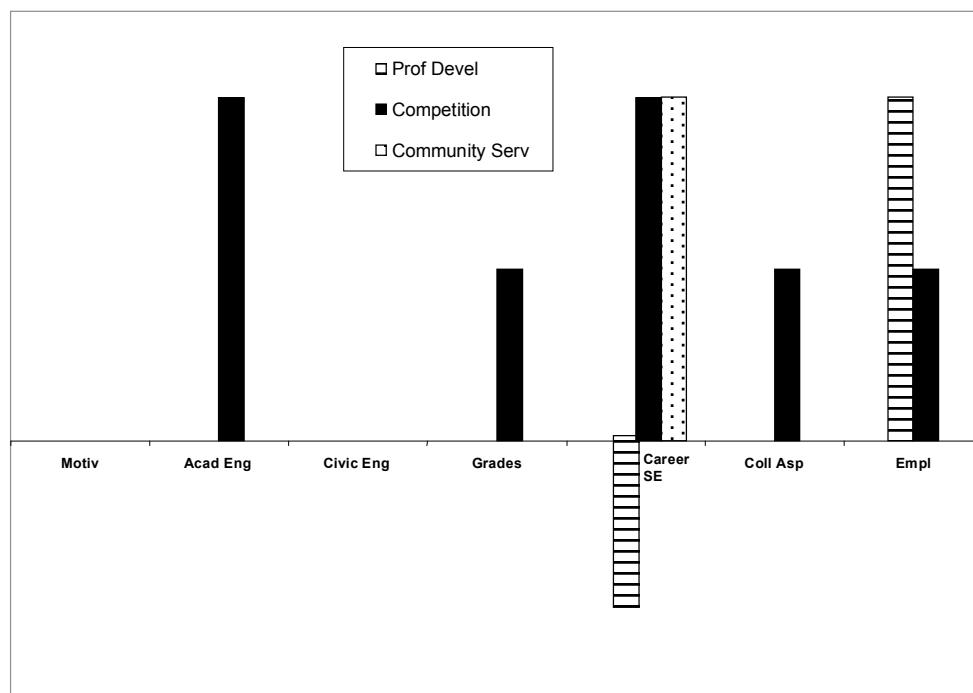


Table 6. Predicting Change in Outcomes from Types of CTSO Activities

	Outcome Variables				Academic Engagement				Civic Engagement				GPA				Career Self Efficacy				College Aspirations				Employability Skills			
	Academic Motivation		Academic Engagement		Civic Engagement		GPA		Career Self Efficacy		College Aspirations		Employability Skills															
	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE		
Intercept	2.42***	0.209	1.58***	0.138	2.25***	0.278	2.31***	0.519	2.72***	0.205	3.02***	0.552	1.69***	0.212														
Slope	0.28***	0.054	0.32***	0.062	0.37***	0.058	0.56***	0.064	0.247***	0.054	0.201*	0.076	0.247***	0.084														
Leadership Position (A)	0.034	0.022	0.042	0.022	0.003	0.042	0.044	0.062	0.015	0.022	0.002	0.068	0.039	0.038														
Professional Develop (B)	-0.025	0.031	-0.034	0.032	0.043	0.051	-0.047	0.077	-0.048 ^t	0.026	0.039	0.074	0.119***	0.052														
Competitive Events (C)	0.060	0.037	0.11***	0.044	0.053	0.052	0.145 ^t	0.080	0.074*	0.032	0.160 ^t	0.094	0.056 ^t	0.052														
Community Service (D)	0.031	0.080	0.080	0.052	-0.077	0.111	0.025	0.168	0.209***	0.049	0.060	0.235	-0.040	0.088														
<hr/>																												
Control Variables																												
Female	0.070	0.041	0.030	0.043	0.065	0.072	0.367***	0.109	0.058	0.058	0.047	0.119	0.018	0.092														
White	0.005	0.054	0.001	0.046	-0.116	0.112	0.105	0.176	-0.045	0.094	-0.214	0.244	-0.100	0.152														
Grade	-0.003	0.023	0.017	0.022	0.019	0.040	0.060	0.065	0.028	0.025	-0.007	0.103	-0.153	0.080														
Extracurricular Involvement	-0.006	0.010	<-0.001	0.007	0.016*	0.008	0.029***	0.012	0.003	0.004	0.055***	0.018	0.020	0.012														
Volunteering Weekly	0.035*	0.016	0.061***	0.019	0.111***	0.036	0.006	0.055	0.035	0.026	0.136	0.079	0.089*	0.037														
Job Weekly Hours	-0.033*	0.015	0.002	0.013	-0.056*	0.028	-0.009	0.043	0.018	0.022	-0.025	0.043	0.037	0.031														
Total Variance	0.217		0.216		0.706		1.415		0.324		2.100		0.284															

^t p < .10, * p < .05, ** p < .01, *** p < .001

Findings

In this longitudinal study of the value added by career and technical student organizations (CTSOs) to the high school experience, we compared CTSO classrooms to (a) CTE-only classrooms and (b) general education classrooms. In order to isolate the CTSO experience, we controlled for students' participation in other activities (extracurricular activities, part-time work, and volunteering) that might affect our outcomes of interest. This means that we can be fairly certain that our findings are due to CTSO participation alone rather than any of the students' other involvements.

Our first research question simply asked whether being in a CTSO vs. CTE-only or vs. a general classroom had any effect on the outcome variables elsewhere associated with CTSOs in the literature. We found that being in CTSO (vs. CTE-only) class was associated with higher beginning (Fall) levels of academic engagement, civic engagement, career self-efficacy, and employability skills (it also tended to be associated with higher levels of motivation). However, while both groups gained in these measures over the academic year, those in CTSO classrooms gained less (but still ended at the same level or higher) than those in CTE classrooms.

Compared to being in a general classroom (non-CTE courses such as English, social studies), being in a CTSO was only associated with higher levels of career self-efficacy in the Fall, and while both CTSO and general students gained over the school year, CTSO students gained significantly less on this measure over the year. In addition, while their levels were not significantly different from those of general students in the Fall, CTSO students also gained less than general students in college aspirations (and tended to gain less in civic engagement) between Fall and Spring.

The second research question went beyond this simple comparison of classroom type and asked whether the *amount* of participation in a CTSO mattered. The answer was an unequivocal yes. Specifically, we found that the more the students participated in CTSO activities, the higher their academic motivation, academic engagement, grades, career self-efficacy, college aspirations, and employability skills. The only measure that was unaffected by degree of participation in a CTSO was civic engagement.

The third research question asked whether the specific *type* of CTSO activity mattered, that is, what is it about participation in a CTSO that affects what kind of outcome? We found that the only element of CTSO participation that did not have a specific benefit was leadership, perhaps because students in leadership positions come in with high scores on these measures to begin with; therefore there is little more to gain.

Overall, we found some support for our theoretical model, while some specific hypothesized links were not borne out. Further research may be able to ascertain whether these positive effects endure after high school and into

postsecondary and employment contexts.

Limitations

There are several limitations to this study. First, the sample of teachers was not a random sample and therefore we cannot make the claim that the sample is representative of the population. Nor were teachers blind to the purpose of the study. We recruited volunteer teachers to have their classes take our survey, and such individuals may differ from the rest of the CTE, CTSO, and general populations. Another limitation is that the number of teachers recruited from each of the eight CTSOs varied, so that those whose teachers had higher rates of participation are better represented in these results. Because the teacher sample was not necessarily representative, it follows that their students are also not likely to be representative. However, because few students refused to participate, we were able to survey a good cross-section of students in these classes.

National data show that there are about equal numbers of males and females in CTE (Deluca, Plank, & Estacion, 2005) but that minority students participate at higher rates (Deluca et al., 2005; Stone & Aliaga, *in press*). Our sample was mostly white.

There was some attrition between Fall and Spring survey administrations which reduced our overall N for these analyses, but a missing data analysis showed that there was no significant pattern to which students did not take the second survey. Still, as will be seen in the results, we had a relatively small sample size for the number of variables we examined.

We called everyone in a CTE class “a CTE student,” although their experience with CTE could range from one semester to several years. Furthermore, because participation in CTE is voluntary, since it is considered an elective, and participation in the associated CTSO, if one is offered at the school, is also voluntary, students who enroll are likely to differ from students who do not enroll in CTE and/or a CTSO.

Finally, for most students, participation in a CTSO is, at minimum, a two-year process; for some it may be a four-year process. Therefore, in the space of one academic year it is likely that we were not able to capture the full effects of participation in a CTSO.

Discussion and Implications

As a whole, our findings suggest that CTSOs do have beneficial effects on the experience of high school students, though in general not more than other types of classes. The CTSO students in this study started out and ended up with higher levels of academic engagement, civic engagement, career self-efficacy, and employability skills than CTE-only students (they also reported higher levels of

participation in extracurriculars, work, and volunteering). CTSO students did not gain as much over the academic year as students in the comparison groups; the gap between the groups simply narrowed. It appears that students who are drawn to participate in CTSOs are “good students” to begin with. Indeed, this self-selection bias has been noted in other studies of activity participation (e.g., Hansen, Larson, & Dworkin, 2003; McIntosh, Metz, & Youniss, 2005). However, we did find evidence that the benefits of CTSOs can be enhanced the more a student participates, and the effects for academic engagement are particularly strong. This may mean that positive outcomes for individual students could be enhanced by participating in CTSOs at high levels, particularly in competitive events, which we found to have effects on the most outcomes.

Our results suggest that it would be beneficial if an even larger group of students (not just the “good students”) were to participate in CTSOs. The National Research Council (2004) found that many students who are at risk from disengaging from school lack peer groups with high expectations for success and strong ties to education. Furthermore, there is some evidence from other research that school-based activities “benefit socioeconomically disadvantaged students as much or more than advantaged students” (Marsh & Kleitman, 2002, p. 464), and that, conversely, students who disengage from structured activities exhibit higher rates of delinquency (Persson, Kerr, & Stattin, 2007). CTSOs might be one way to re-engage “at-risk” students, if they can attract and retain them.

As mentioned in the introduction, CTSOs were hypothesized to have beneficial effects on key outcomes for participating students for a variety of reasons, including their provision of authentic instruction, supportive adults, a task-focused peer group, clear goals and rewards, and opportunities for achievement, leadership, and skill development in a career-related field. The effects of participation were smaller than we expected, and not always in the hypothesized direction. One academic year is likely not a long enough time frame in which to detect measurable results. Furthermore, because many of the CTSO participants were already high on characteristics such as academic engagement at the start, their gains look very small. However, at least in the case of the negative slope for motivation, the result should not be surprising; Jacquelynne Eccles, Allan Wigfield, and their colleagues have found steady decreases in academic motivation across all demographic groups through the high school years (Wigfield & Eccles, 2002; Wigfield & Wagner, 2005). These researchers attribute the decline to a variety of social and cognitive factors that come into play in adolescence, including more a more accurate sense of one’s competence and a heightened awareness of competition (Wigfield, Eccles, & Rodriguez, 1998). It is reassuring that in our study, the CTSO students declined in academic motivation at a slower rate than did other students.⁶ Other longitudinal

⁶ Or, the drop in grades over the year among CTSO students may just be a reflection of the fact that a greater proportion of them are seniors than the other groups and may be experiencing “senioritis” (Hoover, 2003).

research with adolescents has found a decline in participation in structured activities over time (Persson, Kerr, & Stattin, 2007). Not only are the CTSO students in our sample involved in a CTSO, they also have higher rates of participation in extracurricular activities than do general students, suggesting that they are engaged in positive activities that may buffer them from the negative influences of unstructured time outside of school (Persson, Kerr, & Stattin, 2007).

While there was not much gain in levels of civic engagement over the academic year for any group, CTSO students had higher levels than CTE students, suggesting that adding a CTSO component to CTE programs would help more high school students participate in their communities as citizens. We also found that CTSO students reported similar levels to general students, and higher levels than CTE students, of employability skills. This suggests that the attraction of a “real world” instructional environment in CTE classroom can be enhanced by incorporating a student organization component that helps students understand and experience what is necessary in the workplace.⁷

The results indicating that CTE and CTSO students have lower college aspirations than the general group of students should not be worrisome for several reasons. First, on average, they still aspire to somewhere between a B.A. and an M.A. degree. Second, if more career technical students are drawn to a 2-year or technical college than to a 4-year college, pulling the average number of years in formal education down lower than that of general students, this may actually reflect a realistic and adaptive choice if they are interested in a technical career (Berg, 2004; Csikszentmihalyi & Schneider, 2000; Gray, 2000). Researchers have suggested that many of the students from the general population who aspire to more higher education either will not finish (Education Weekly, March 2005) or will find themselves downwardly-mobile after they graduate (Berg, 2004; Csikszentmihalyi & Schneider, 2000). Gaining a technical education at a less-than-four year college may in fact be a better bet in terms of future employability (Gray, 2000; Wood, 2006). Third, we found that participating specifically in leadership and professional development activities in a CTSO serves to raise students’ educational aspirations. Incidentally, our finding of lower aspirations among CTE students also supports the findings recently reported in the NAVE (National Assessment of Vocational Education, Levesque, 2003) and elsewhere (e.g., Deluca et al., 2005).

⁷ Together, these two findings may reflect the fact that CTSO students report spending more hours per week volunteering and working, variables which were held constant in the statistical analysis. Had they not been controlled, we might have seen even stronger effects of CTSO participation on the civic engagement and employability outcomes.

Conclusion

While CTSOs have received much attention in the CTE field, most of the research on their contributions and benefits to high school CTE students is anecdotal. This study aimed to test many of the anecdotal claims empirically. A foundation of 30 years of descriptive literature on CTSOs, as well as research on the development and education of high school students, formed the basis for the theoretical model. The study used a rigorous research design and reliable measures to test the model in a variety of states and programs. It is one of the first studies to systematically examine the context of CTSOs and their relation to student outcomes.

Future research on the effect of CTSOs should examine student transcripts for achievement, attendance, and on-time graduation data. It is especially important to look at coursetaking. The program of courses that students take is highly predictive of college enrollment (Adelman, 1999). Follow-up studies with students who participated in CTE and CTSO in high school should be conducted to examine their post-high school trajectories into work and/or college.

Thousands of students participate in CTSOs, and we are glad to have opened the “black box” of processes that occur within them. In sum, we found that CTSOs are beneficial to students, but that they have great untapped potential that can be realized if they become more prevalent in CTE programs and more inclusive of all kinds of students.

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No Curriculum Left Behind: The Effects of the No Child Left Behind Legislation on Career and Technical Education

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Abstract

This manuscript describes the impact of the No Child Left Behind (NCLB) legislation on Career and Technical Education (CTE) programs. The manuscript begins with a review of the various aspects of the NCLB legislation, discussing historical legislation leading up to NCLB and emphasizing contemporary issues that affect K-12 education. The manuscript then addresses the curricula that are left behind due to the increased focus on core academic courses, with an in-depth analysis of how NCLB affects CTE programs. The findings are centered on four areas in which the NCLB policy affects CTE programs: (a) CTE teacher qualifications, (b) the adequate yearly progress (AYP) provision, (c) CTE reform initiatives, and (d) CTE legislation objectives. The manuscript concludes with discussion on the future implications for CTE programs such as the need for increased accountability in CTE teacher education programs and further research on CTE student outcomes

Introduction

With the growing expectation that all students participate in post-secondary education to be prepared for the future, it is vital to focus on student learning in K-12, especially at the high school level (Krueger, 2004). To address the challenge of preparing students for success at the postsecondary level, many policymakers believe that an effective comprehensive school reform (CSR) initiative is necessary. One of the most recent and comprehensive school reform initiatives is the No Child Left Behind (NCLB) Act of 2002, intended to increase accountability for K-12 schools across the nation. This manuscript begins with a thorough investigation of the history leading up to NCLB, along with the intent and rationale of the NCLB policy to gain a better understanding of the legislation's impact and the challenges it brings for K-12 education and its stakeholders. The remainder of the manuscript focuses on the affects NCLB has on Career and Technical Education (CTE) courses concluding with future implications of NCLB on CTE programs. In addition, this manuscript highlights a CTE CSR initiative. The purpose of this manuscript is to gain a better understanding of the implications NCLB has on CTE courses at the secondary level and to illustrate challenges inherent in CTE programs as a result of contemporary educational objectives. The method utilized in attaining a better understanding of the implications NCLB has on CTE courses were based on a thorough literature review

of empirical and anecdotal evidence of primarily contemporary scholars and practitioners in the field of CTE.

Issues of the No Child Left Behind Policy

A Historical View. Traditionally, the federal government has had an impact on educational initiatives. In the 1954 Supreme Court decision *Brown v. Board of Education*, the federal government prohibited state-mandated segregation among black and white students and paved the way for further progress in education through policies such as Title IX and the Individuals with Disabilities Act (IDEA), which gave previously excluded students rights to equal educational opportunities (Bailey, 2000; Landsberg, 1995; Sunderman, 2006). In addition, the federal government played a significant role in providing funding for educational research and development. According to Sunderman (2006), “Title I of the Elementary and Secondary Education Act of 1965 (ESEA), Head Start, and other federal early education programs provided additional resources to states to develop programs that assist educationally and economically disadvantaged students” (p. 13).

In the 1980s, the need for transformation in education was sparked by the publication of *A Nation at Risk*, a report written by The National Commission on Excellence in Education (1983); as a result, the federal government enacted educational legislation that was designed to address problems such as the lack of quality that exists regarding teaching and learning in the schools (Sunderman, 2006).

The focus on quality has continued and the current concern of policymakers focuses on goals of raising standards in the core curricula in order to enhance quality. An increase in student assessment was the mandated method of measuring the effectiveness of new educational initiatives (Daley, 2003; Sunderman, 2006; Swanson, 2004). According to Sunderman, “America 2000 adopted under President [George H.] Bush in 1989, Goals 2000 adopted during the Clinton administration in 1993, and the Improving America’s School Act of 1994 all reflected this new agenda” (p. 14). In addition, the NCLB Act, signed by President George W. Bush in 2002 enabled the federal government to enact an overhaul of the educational system by constructing policies to revamp curriculum, instruction, assessment, and teaching. According to Reese (2004), “When President George W. Bush signed the No Child Left Behind Act (NCLB) into law in January 2002, it was generally described as the most sweeping national education reform that had been enacted in decades” (p. 33).

NCLB: An Overhaul of the Educational System. The NCLB Act is one of the most widely debated, closely scrutinized, and highly controversial educational policy initiatives of the past decade (Mantel, 2005; Sunderman, 2006). The main objective cited by NCLB supporters is to raise the achievement level of all students, and particularly to close the academic performance gap between majority (white) students and students from low socioeconomic backgrounds, students who are members of racial and ethnic minorities, or students who have limited English

proficiency (Daley, 2003; Mantel, 2005; No Child Left Behind Act, 2001). The NCLB policy purports to raise standards by testing, holding all students and schools accountable, increasing public awareness of schools' progress, and ensuring all teachers are highly qualified (Mantel, 2005; No Child Left Behind Act, 2001). To better understand these facets, this manuscript describes each of these, including their inherent challenges.

Raising Standards by Testing. The goal of NCLB is to increase the academic rigor of the core curricula and enable students to take a coherent set of courses to prepare them for postsecondary education (Mantel, 2005). Currently, all states are mandated to assess students in grades 3-8 annually and high school students once; before NCLB, students were assessed four times in grades K-12 (Austin & Mahlman, 2002; Mantel, 2005; Pascopella, 2006). Title I of the NCLB Act requires states to create assessments that correlate with state standards for reading and mathematics while many states also include science and social studies. The information gained from these assessments is used to monitor student performance and identify schools that are underperforming (Goertz & Duffy, 2003). States are required to establish cutoff scores that categorize students specifying "basic," "proficient," or "advanced" skills in each particular discipline. One of the major challenges inherent in the goal of raising standards by testing is that each state is allowed to determine its own requirements and implement its own regulations (Mantel, 2005).

Another issue regarding raising standards by testing is that some high schools set a cutoff score for their students and require that they meet or exceed it to warrant a diploma, therefore making the assessment high-stakes. These high-stakes assessments are used for making important decisions about students, including decisions about promotion to the next grade level, in-grade retention, and graduating from high school (Harvey & Koch, 2004; Plake, 2002). According to Goertz and Duffy (2003), assessments are considered high-stakes depending on the level of consequences; assessments may have high-stakes for schools because of their inability to demonstrate progress and may result in state intervention or full state control over school administrators. In 2008, 28 states will enact a requirement for their students to pass a state-mandated assessment to meet their graduation requirements (Vogler, 2004); in addition, seven states will place student scores on transcripts or diplomas (Goertz & Duffy, 2003).

In a review of the literature, assessment experts tend to disagree with using one assessment to make multiple decisions such as indicating the performance of students, making decisions regarding the future of schools and students, and assisting in revamping instructional methods (Goertz & Duffy, 2003; Neill, 2006; Vogler, 2004). Austin and Mahlman (2002) point out two dilemmas that involve high-stakes assessment: (a) the current educational policies (such as NCLB) and public expectations of the assessments often outweigh the capabilities of the assessments, resulting in utilizing the assessments for invalid uses; and (b) the fairness of the

assessment and the long-lasting affects of categorizing students based on their performance is debatable and problematic.

In a review of the literature on teacher perceptions of the increase in testing, the overwhelming perceptions among teachers are negative (Abrams, Pedulla, & Madaus, 2003; Sunderman, Tracey, Kim, & Orfield, 2004). A nationwide survey disseminated by the National Board on Educational Testing and Public Policy found that the increase in testing students contradicts teachers' perspectives of administering proper educational practices (Abrams et al., 2003). The study also indicates that teachers sacrifice good teaching practices by focusing on test-taking strategies and studying the content mirrored on state tests. This appears to be the consensus among current research (Herman & Dietel, 2005; Neill, 2006). In addition, an increase in stress and decrease in morale were also factors noted by teachers and students. For students, frequent low performance on high-stakes testing may result in dropping out of high school (Harvey & Koch, 2004). The intended purpose of using high-stakes testing is to ensure accountability among all students and schools; yet, the end results often create a difficult circumstance.

Holding all Students and Schools Accountable. Students and schools that do not meet the requirements may encounter harsh consequences under NCLB. One consequence a student may face by not meeting state requirements may be not graduating. Consequences for schools may include sanctions and the replacement of school administration. Schools not meeting state requirements regarding student performance for two years in succession are defined as a school in need of improvement and the administration must devise a two year plan to improve its status (Mantel, 2005; Reese, 2004). Students in schools denoted as in need of improvement are given the option to transfer to another school (Mantel, 2005). However, according to a 2006 study by the Center on Education Policy, only 2% of students have taken advantage of the option to transfer to another school. Schools not meeting requirements for three years in succession are mandated by the state to fund school reform initiatives such as tutoring, after-school programs, and summer school for their students in order to raise student performance (Gordon & Yocke, 2005; Mantel, 2005). In addition, schools failing to meet requirements after four years in succession are reorganized by the state. Further research by Mantel (2005) indicates that "eleven thousand public schools – or nearly 12 percent of the nation's 96,000 public schools – failed in 2004 for the second year in a row to meet 'adequate yearly progress' (AYP) targets set by the No Child Left Behind law" (p. 475). According to Abrams et al. (2003), schools that under-perform may lose accreditation, funding, and risk invasion by the state.

Increasing Public Awareness of Schools' Progress. According to Mantel (2005), individual schools are required to report results of student performance categorized into four student subgroups: (a) low-income students, (b) students from underrepresented racial and ethnic groups, (c) students with disabilities, and (d) limited English proficient students. The breakdown of students into these four

subgroups enables the public to assess whether or not the NCLB policy is helping to bridge the academic gaps among multiple student demographics. In a survey disseminated to school districts by the Center of Education Policy (2006), “states and districts were more than likely to say that achievement gaps between white and black students, white and Hispanic students, and English-language learners and other students were narrowing rather than widening or staying the same” (p. 474).

Ensuring Highly Qualified Teachers. The NCLB policy takes a holistic approach in improving student performance including ensuring that all teachers are highly qualified. According to the U.S. Department of Education (2004), the NCLB policy mandates that all core academic teachers (i.e., English, reading or language arts, math, science, history, civics and government, geography, economics, the arts and foreign language) have a bachelor’s degree along with certification for the subject areas that they teach. By the end of the 2005-2006 school year, to be a highly qualified teacher, one must earn a bachelor’s degree, be state certified, and exhibit a specified level of competency for each content area one teaches (Reese, 2004; U.S. Department of Education, 2004).

Impact of NCLB on Curricula

Many would agree with Harvey and Koch’s (2004) statement that “students should be provided curricular options that meet their academic, occupational, and postsecondary educational needs. The approach to school improvement needs to include all educational opportunities that can meet the challenges reform efforts are meant to address” (p. 12). Therefore, it is important to address the impact that NCLB has on what is taught in schools. Findings indicate that due to NCLB’s requirements that students be proficient in core academic classes, teachers spend the greatest amount of time on curricula on which students will be assessed and may even neglect or de-emphasize curricula not tested (Abrams et al., 2003; Goertz & Duffy, 2003; Mantel, 2005). According to Abrams et al., “In general, teachers in high-stakes states reported significant decreases in time spent on instruction in the fine arts, industrial/vocational education, field trips, class trips, enrichment assemblies, and class enrichment activities” (p. 6). According to the Center on Education Policy (2006),

In some case study districts, struggling students receive double periods of reading or math or both – sometimes missing certain subjects altogether. Some school districts view this extra time for reading and math as necessary to help low-achieving students catch up. Others pointed to negative effects, such as short-changing students from learning important subjects, squelching creativity in teaching and learning, or diminishing activities that might keep children interested in school. (p. vii)

Another issue expressed by Diane Rentner, project coordinator at the Center on Education Policy, is that school districts with fewer funds are more likely to spend

more time preparing students in math and reading, which in turn may cause those students to have a less rich curriculum (Mantel, 2005). According to the Center on Education Policy (2006), “Urban districts are increasingly experiencing the greatest effects...about 90% of the schools in restructuring, the last stage of NCLB’s sanctions, are in urban districts” (p. ix). In a review of the literature, findings indicate that the increased pressure on assessment mandated by NCLB seems to have a negative impact on the quality of instruction and results in narrowing of the curricula (Abrams et al., 2003; Austin & Mahlman, 2002; Circle, 2005; Herman & Dietel, 2005; Neill, 2006; Weland, 2006). Due to the increased emphasis on core academic programs, anecdotal evidence indicates that curricula may be getting “left behind” in relation to other areas. This likely influences CTE curricula, among others.

What is Career and Technical Education?

Career and Technical Education: An Historical Account. CTE, formerly known as vocational education, originated in the early 20th century, but may be traced back to ancient times (Gordon, 2003; Gray & Herr, 1998). According to Lynch (2000), “The earliest vocational programs were grounded primarily in the need to prepare more blue-collar-type students with practical skills for the nation's farms, factories, and homes” (¶ 4). Historically, the main objective of vocational education was to prepare students for entry-level jobs that did not require a baccalaureate degree (Blank, 1999; National Center for Education Statistics, 1995; National Center for Education Statistics, 2000). The federal government has had a long-standing awareness of the importance and relevancy of CTE courses to preparing students for citizenry and for the economic development of the U.S. Gordon notes that a major piece of legislation that paved the way for later funding from the federal government was the Smith-Hughes Act of 1917; this act called for separating vocational courses from the traditional, comprehensive curriculum in high schools (Bragg, 1999; Gray, 1999; Gray & Herr, 1998). According to Gordon, “The impact of this separation has been felt through subsequent decades in the development of separate training programs, separate teacher organizations, and separate student organizations” (p. 81).

Gordon (2003) indicates that the Perkins-Morse Bill was passed in 1963 and was the most profound piece of legislation affecting vocational education since the Smith-Hughes Act of 1917. He further purported that the main objective of Perkins-Morse, commonly known as the Vocational Act of 1963, was to provide an opportunity to participate in vocational training for all individuals. According to Gordon, “The Vocational Act of 1963 authorized the appropriation of millions of dollars for vocational education in an attempt to find solutions to the nation's social and economic problems” (p. 85). The Carl D. Perkins Vocational Act of 1984 amended the Vocational Act of 1963, replacing the 1968 and 1976 amendments. In 1990, President George H. Bush signed the Carl D. Perkins Vocational Educational Act of 1984 and named it the Carl D. Perkins Vocational and Applied Technology

Education Act with the intent to bridge the gap between traditional academic and vocational courses (Eden, Stasz, Ramsey, & Bodilly, 1994; Finch, 1999). In 1998, the Carl D. Perkins Vocational and Applied Technology Education Act was renamed the Carl D. Perkins Vocational and Technical Education Act and was signed by President Clinton (Apling, 2003). In addition, this legislation appropriated the largest amount of funds in history for vocational education and is currently the largest federal investment in secondary schools (Phelps, 2002; Sarkees-Wircenski & Wircenski, 1999; Phelps, 2002). "Perkins II [the Carl D. Perkins Vocational and Applied Technology Education Act of 1990] emphasizes (1) integration of academic and vocational education, (2) articulation between segments of education engaged in workforce education preparation – epitomized by congressional support for tech prep, and (3) closer linkages between school and work" (Gordon, 2003, p. 88). This revolutionary change has summoned a new ideology for the current state of CTE as a necessary component of the high school curricula. The 1990 Perkins Act mandates that states devise performance standards for secondary and post-secondary CTE programs in alignment with the prevailing NCLB policy.

Career and Technical Education Today. CTE has evolved to better meet the needs of contemporary students mainly by the frequent change in legislation. According to Krueger (2004),

The economic and social realities of the 21st century necessitate that nearly every American has access to some form of postsecondary education. One increasingly important pathway to education and training beyond high school is career and technical education. Once considered an option only for low-achieving, noncollege-bound students, career and technical education programs now serve students looking for high-technology jobs and good salaries, which in turn contribute to a state's economic development.(¶ 1)

CTE courses typically are categorized into eight major programs of study: (a) agricultural education, (b) business education, (c) marketing education, (d) family and consumer sciences education, (e) trade and industrial education, (f) health occupations education, (g) technology education, and (h) technical education (Association of Career and Technical Education, 2006; Gordon, 2003). Based on federal reports, CTE programs are available in 93 percent of the comprehensive high schools in the U.S.; many of these schools offer introductory courses such as life skills, keyboarding, introduction to computers, technology education, and/or family and consumer sciences. Seventy-five percent of comprehensive schools offer advanced courses in one of the eight major programs of study noted previously (Lynch, 2000). Approximately one-fifth of total credits attained by public high school students are from CTE courses (Gray & Walter, 2001).

How does NCLB affect Career and Technical Education Programs?

It is possible that many assume the NCLB policy does not affect CTE

programs because the objectives of NCLB appear to be directed towards the core academic courses such as English, math, and science. However, anecdotal evidence suggests otherwise. Tom Applegate, president of the ACTE, in an article by Lewis (2004), suggested that “NCLB was ‘squeezing career and technical education’ out of the curriculum”; he further stated that if that is the result “then we really shot ourselves in the foot in terms of some of our other missions in education” (¶ 7).). In fact, the National Assessment of Vocational Education ([NAVE], 2004) found a national .2 decline in the amount of vocational credits earned and a 2.8 decline in the percentage of students who are occupational concentrators. Despite the limited research on how NCLB affects CTE programs, Phelps (2002) points out that, “Career and technical education (CTE) is not immune from the provisions of NCLB” (p. 1). Austin and Mahlman (2002) add, “In many states CTE students are now in the same ‘high-stakes kettle’ as students in other tracks...One hypothesis is that CTE is an area to which students with low scores or special needs are steered” (p. 5). The remainder of this manuscript will explain the various aspects in which the NCLB policy may affect CTE programs; these aspects include CTE teacher qualifications, the adequate yearly progress (AYP) provision, CTE school reform initiatives, and CTE legislation objectives. Finally, this manuscript will point out various implications for CTE programs.

CTE Teacher Qualifications. As noted in the *Ensuring Highly Qualified Teachers* section, the NCLB policy states that all core academic teachers are mandated to comply with NCLB requirements for becoming a highly qualified teacher. This statement indicates that CTE teachers who teach courses where students receive core academic credit must be highly qualified; in contrast, CTE teachers who do not teach courses in which a student may receive core academic credit are exempt from this provision. Despite this current provision, many high school CTE programs do in fact require CTE teachers to earn a bachelor’s degree, teaching certificate, and pass an assessment in the particular subject area in which they teach, making them highly qualified. This may serve as an indication that CTE programs are increasing standards in light of the NCLB provisions.

The AYP Provision. By 2014, NCLB mandates that all students have a score of proficient or above on state assessments enabling all schools to meet AYP standards (Phelps, 2002; Shibley, 2005). Despite the emphasis of NCLB on testing students’ proficiency in reading, science, and mathematics only, CTE teachers and students are affected by NCLB’s AYP provision. According to Phelps,

All students, including CTE students, will be impacted by AYP...Some have forecasted that this focus on academics will result in a reduction of secondary CTE programs. In some states, we are already seeing increased academic courses for graduation, therefore reducing the time available to students to take career technical courses. This falsely assumes that simply taking more academic courses will increase academic achievement. (p. 6)

This insight reinforces the assumption that CTE courses may be squeezed out of the

curricula with students and administrators believing that CTE courses are a waste of time; therefore, students may be taking less CTE courses to compensate for their perceived time lost. One major misconception that individuals may fail to realize, according to Phelps, is that high school students taking CTE courses also take academic courses. He further suggests that a solution may be to coordinate NCLB's efforts with the funding of Perkins by having students taking CTE courses categorized into a subgroup by the state with an alignment of performance goals for each student to meet.

CTE Reform Initiatives. As indicated in the *Raising Standards by Testing* section, NCLB has at its pinnacle to provide students with a rigorous education in order to perpetuate student admission to post-secondary education (DeLuca, Plank, & Estacion, 2006). Synonymous with the name change from vocational education to career and technical education, contemporary CTE objectives emphasize a dual mission of preparing students for both the workplace and for higher education (college or technical schools) (Bragg & Reger, 2000; Castellano, Stringfield, & Stone, 2003; Castellano, Stringfield, Stone, & Lewis, 2002; Eden et al., 1994; Eisenman, 1998; National Center for Education Statistics, 1995; Parks & Moreton, 1999; Plank, 2001; Walter & Gray, 2002). As a result, many CTE researchers call for integration of CTE and academic programs of study for all students focusing on career clusters instead of a particular occupation. Stated differently, the current major focus of CTE is to require all students to participate in a combination of CTE and academic courses and to focus on broad career clusters instead of specialized jobs in CTE courses. According to Phelps (2002), CTE programs are implementing CSR to meet the objectives of NCLB under Title I, Section III4 and the 1998 Perkins Act. Furthermore, "CSR is built on the premise that unified, coherent, and integrated strategies for improvement, knitted together into a comprehensive design, will work better than the same strategies implemented in isolation from each other" (p. 7). CSR designs typically involve the integration of CTE programs at the high school level (Castellano et al., 2003). DeLuca et al. (2006) call the revolutionary idea of combining academic and CTE coursework "an era of de-tracking", eliminating the tendency for students to be funneled into an academic or CTE course track. This paper will focus on a CSR design initiative called High Schools That Work (HSTW).

High Schools That Work. HSTW was implemented in 1987 by the Southern Regional Education Board (SREB) (Castellano et al., 2003). According to the SREB website, the initiative has grown to include more than 1,200 sites in 32 states (<http://www.sreb.org/programs/hstw/hstwindex.asp>). The main objective of the HSTW initiative is to increase the academic achievement of high school students by combining traditional college preparatory courses with CTE courses; HSTW is the first large-scale CSR program to do so (Castellano et al., 2003; Flowers, 2000; Gordon, 2003). The curriculum of the HSTW initiative calls for a more rigorous program of study than traditional CTE programs, with students completing three credits in math and science, two credits in college preparatory courses, and four

courses in college preparatory English (Gordon, 2003). Furthermore, students declare a major while taking a coherent sequence of courses combined with at least two CTE courses. Finally, the HSTW initiative mandates that all students complete the HSTW assessment of reading, mathematics, and science that is derived from the National Assessment of Educational Progress (Castellano et al., 2003). Castellano et al. found HSTW to be successful, especially in keeping at-risk students from dropping out. Although they state that research findings on the effects of the HSTW initiative tend to be positive, they also indicate that more research is needed, especially by a third party researcher. The CSR program focuses on assessments to parallel the objectives of NCLB in increasing reading, math, and science scores on state-mandated assessments (Phelps, 2002). According to Castellano et al. (2002),

One of the keys of comprehensive reform is relevance, which helps keep students in school and interested. Focusing on career opportunities or special interests is one way to make education relevant. Thus, it seems that the combination of career and technical education with rigorous academics for all students is a reform model worth considering. Together, these efforts can address the need that all students have for a solid academic education, as well as for preparation for adult life, including work. (p. 6)

CTE Legislation Objectives. According to the American Federation of Teachers (2006), “The president’s FY2007 budget calls for a \$2.1 billion reduction in federal education funding – the largest cut in the 26-year history of the Education Department”. If passed, this proposal would have cut 24 programs including \$1.3 billion in CTE programs, education technology state grants, GEAR UP, Safe and Drug-Free Schools, Communities State Grants, TRIO Talent Search, and Upward Bound (AFT, 2006). According to Dervarics (2006), this cut would be based largely on ending the Carl D. Perkins Act of 1998. AFT President Edward McElroy stated that it “represents a huge reversal in the federal government’s commitment to education at a time when new, rigorous requirements for students and teachers need to be met” (¶ 2). According to Lewis (2004), CTE leaders felt that President Bush’s proposed cutting of Perkins’ funds were due to misinformation. Michael Rush, president of the NASDCEC, adds,

The President is getting some inaccurate and outdated information on existing programs and reform efforts in career and technical education. At a time when the country’s economy demands a well-trained workforce and when the added emphasis on academic performance requires an applied context, a significant reduction in funding just doesn’t make sense. (Lewis, 2004, p. 6)

According to The Associated Press,

The president wants to shift the money into a new effort of expanded high school testing and help for struggling learners. States could spend the money on career courses if they wanted under his plan. But Congress has never

seriously considered the changes Bush wants. (¶ 10)

On July 29th, 2006, according to The Associated Press (2006), Congress agreed to extend the Perkins Act of 1998 until 2012 with goals of increasing rigor and results. This legislation mandates that states implement career programs that enable students to have broader academic skills and holds schools accountable for student outcomes. President George W. Bush signed the legislation in August 2006 naming it the Carl D. Perkins Career and Technical Education Improvement Act of 2006 (ACTE, 2006).

Implications for CTE

After an extensive review of the literature on topics related to the effects of NCLB and CTE programs, there seems to be challenges for CTE programs that need to be addressed. These challenges include ensuring all CTE teachers are highly qualified under NCLB standards and the need for further research regarding performance outcomes of CTE students.

Gray and Walter (2001) indicate that approximately 25% of secondary education teachers are CTE teachers; seventy-nine percent of CTE teachers teach in a comprehensive high school setting. They further note, “The number of college-based CTE teacher preparation programs has declined by at least one-third. Those that remain have been downsized or incorporated into larger curriculum and instruction programs” (p. viii). As a result of the decline in CTE teacher preparation programs, there is a major shortage in CTE teachers (Bruenan, Scanlon, & Hodes, 2001; Gray, 1999; Gray and Walter, 2001; Maurer, 2001; Walter & Gray, 2002). With the increasing standards mandated by the NCLB policy, it seems quite conceivable that future NCLB provisions may ultimately require CTE teachers to be highly qualified along with their core academic teacher counterparts; current trends suggest this is a likely consequence. Requiring CTE teachers to be highly qualified would have serious implications for CTE programs such as requiring CTE programs to create content area assessments and making sure that all CTE teachers have sufficient skills and content knowledge. Another issue regarding CTE licensure and preparation is in regards to the lack of consistency in CTE teacher assessments. According to Gray and Walter, “There are in fact 50 different variations of CTE teacher preparation regulations across the nation” (p. 1). It is to the benefit of CTE programs to be proactive and implement a national standard for all CTE program teachers in the case that CTE teachers will need to be highly qualified in the future. Gray and Walter suggested that states model their teacher preparation practices after the founders of vocational education by having federal mandated minimum credentials required by CTE teachers to receive funding and requiring states to have a state director of CTE. This would enable consistency among each individual state in the nation for CTE teacher licensure and preparation. In conclusion, based on a review of the literature, the effects of NCLB on CTE are four-fold: (a) CTE teachers that teach core academic courses must be highly qualified; (b) CTE students are required to meet AYP

standards outlined by NCLB; (c) CSR initiatives are currently being supported under the NCLB legislation; and (d) the current Carl D. Perkins Career and Technical Education Improvement Act of 2006 must be consistent with the NCLB legislation.

Implications for Further Research. Due to the previous possibility of cutting the Perkins funding, this is the most appropriate time for scholars in the field of CTE to research the various outcomes of CSR in CTE. Sparked by the growing interest for high school students to enter post-secondary educational institutions (the “college for everyone” revolution), one of the most important outcomes to measure is the rate at which CTE students matriculate into post-secondary education institutions, their retention rates, and successful graduation rates. DeLuca et al. (2006) found in a study of 2,564 subjects born in 1980 that approximately 55% of CTE students had indeed enrolled in a post-secondary education institution. In addition, they note a positive relationship with students enrolling in 2-year institutions and a negative relationship of students enrolling in 4-year institutions. They further suggest that future research investigate the possible payoff of students engaged in a combination of academic and CTE coursework along with the long-term economic and educational outcomes. Additional areas for further research include conducting research to better determine the effects of national standards for CTE teacher licensure and preparation and the value of CTE programs in the current educational system.

Conclusion

NCLB has indeed made a major impact on educational curriculum and instruction in schools across America. Although the NCLB policy emphasizes student performance on core academic courses, this emphasis has impacted CTE programs. CTE has constantly battled for its identity and respect as a relevant, meaningful, and essential program for all students (Miller & Gregson, 1999). Once considered as a program to assist students who were non-college bound into occupations, career and technical educators are now struggling to convince policymakers, elected officials, administrators, teachers, and students of a dual mission to prepare students for their future aspirations, regardless of ones post-secondary path. According to John Ferrandino, president of the National Academy Foundation, “The integration of academics with broad exposure to occupational skills is what career and technical education programs will have to look like if they are to remain relevant in today’s world” (Emeagwalli, 2004, p. 36). It is imperative that CTE programs not only emphasize these new 21st century objectives, but also be accountable through empirical research that shows a positive relationship between students who enroll in CTE programs and successful graduation from postsecondary institutions. The previous possibility of cutting the 1998 Perkins Act has stirred up much attention in the CTE community. The NCLB Act does not seem likely to be replaced in the near future, so how the CTE community reacts and responds to this federal legislation may reflect the future state of its programs. As mentioned earlier,

the contemporary CTE objectives emphasize a dual mission of preparing students for both the workplace and for higher education. Therefore, it appears that the new “career and technical education” name may need to be revamped to better reflect the current state of affairs; “college and career preparatory education” seems to better reflect this new agenda. In conclusion, this manuscript articulates many of the implications of NCLB on CTE. Moreover, the implications pointed out in this manuscript may be valuable for CTE practitioners in gaining a better understanding of their roles in light of the NCLB legislation. In addition, this manuscript may assist scholars in framing a problem for further empirical study.

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**Factors Associated with Research Anxiety of University
Human Resource Education Faculty**

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Abstract

Factors associated with research anxiety of university faculty members in human resource education fields were examined. Most of the participating faculty members were male and half were full professors. The mean age was 52 and all but one held a doctorate. Relationships between selected demographic characteristics and The Higgins-Kotrlik Research Anxiety Inventory revealed moderate correlations with rank, the number years employed in higher education, and experience teaching research methods courses. There was a low correlation between research anxiety and the presence of a formal research mentoring program, age, and experience teaching statistics. The regression analysis with research anxiety as the dependent variable revealed that the faculty members' educational preparation, years employed in higher education, and professional environment explained a large amount (48%) of the variance.

Introduction

The latest Carnegie Foundation (2000) categorization of the nation's institutions of higher education increased the numbers of Research Extensive and Research Intensive Universities. The accretion in numbers also increased the quantity of faculty members who are expected to produce scholarly research. Institutions that enjoy an abundance of scholarly research through faculty production also enjoy a heightened reputation as universities on the cutting edge of scholarly issues. The heightened reputation enables these universities to bring in larger grant amounts as well as larger student numbers (Austin & Rice, 1998). Therefore, research productivity has become a benchmark of national and global prestige and has been a key variable for attaining promotion and tenure for many university faculty members. The heightened emphasis placed on scholarly productivity through research may promote anxiety associated with scholarly research productivity of faculty members. A study addressing research anxiety may be instrumental in defining the means to increase research productivity and, at the same time, ease the research anxiety of faculty members.

Faculty members at research universities have, in the past and at the present, had to deal with pressures associated with roles as researchers, teachers, and service

initiators (Miller & Sandman, 1994). The "publish or perish" atmosphere accompanying most university faculty positions often generates questions regarding confidence in one's ability to not only confidently conduct meaningful research, but also to develop a solid and statistically sound research study. The pressures do not stop there, however. Once a study has been developed and conducted, the researcher's next goal is persuading editors of reputable journals to publish the findings. Generally, the process involves sending a manuscript off for a blind, peer review of the study. Anxiety can certainly be expected when one's work is judged and critiqued by peers. Further, the critique may hold the key for future promotions and/or tenure, thus elevating possible anxiety for the researcher. It becomes paramount that the researchers must be confident in the methods of research and the appropriate application of statistics or other methodology in analyzing data collected for research studies.

Anxiety, as defined by the 2001 edition of *Webster's Encyclopedic Unabridged Dictionary*, is ". . . distress or uneasiness of mind caused by fear of danger or misfortune" (p. 96). For the purposes of the study, the definition will take on a more empirical tone of "danger and misfortune" as it relates to professional output and not to a life and death situation. The "dangers and misfortunes" are thus related to not receiving promotion and tenure, stress related to a lack of confidence in one's ability to conduct valid and reliable research, departmental demands, and the anxiety related to peer reviews in the publishing process. Anxiety and stress will have a synonymous connotation and will be used interchangeably.

It has been noted that many in higher education place more value on the teaching aspect of the job and are not so interested in the research aspect of education (Levine, 1997). This notion may place an employee in a quagmire, quite early in his or her career, as many universities place high priority on success in both research and teaching to secure promotion, tenure, and merit pay (McElhinney & Fleming, 1997). Not having a clear definition of what is expected of a faculty member, in terms of research, can be an impetus for anxiety. When perusing the advertisements for employment in higher education, one finds that almost every job description is accompanied by the mission statement of the university or college. These missions almost always state that a prospective applicant should be establishing, or must have already established, a research agenda related to the position. Applicants who have not given thought to a research agenda must do so, as well as put together a portfolio that documents this agenda to enhance their chances of attaining employment in higher education.

Studies have also delved into the effects that stress may have on faculty health. It is one thing to lose a promotion, but an altogether different thing to lose one's health. High levels of anxiety have been linked to serious health problems such as physiological, psychological, and behavioral disorders (Blackburn, Horowitz, Edington, & Klos, 1986). These health problems are not only inherent in Corporate America, but also to academia. Studies also link "burnout" to anxiety, which leads to

a stagnation in scholarly productivity as well as social seclusion. Depending upon severity, these are not small problems which can be associated with anxiety (Libby & Walz, 1987). Anxiety in higher education can affect faculty members' performance on several different fronts. It may impede scholarly productivity, lessen perceptions of job satisfaction, and even negatively affect the health of the faculty member.

Purpose and Objectives of the Study

The purpose was to determine if certain factors explained the variance in research anxiety in Human Resource Education faculty. The objectives of this exploratory study were to:

1. Determine selected demographic characteristics (gender, age, rank, highest degree held) of university faculty members, their perceptions of the professional environment, and their educational preparation.
2. Determine research anxiety levels of university faculty members.
3. Determine if significant correlations exist between the independent variables (educational preparation, selected personal characteristics, and professional environment) and the research anxiety of university faculty members.
4. Determine if selected variables (educational preparation, personal characteristics, and professional environment) explain significant portions of variance regarding research anxiety in university faculty members.

For the purposes of this study, human resource education includes those faculty in the following workforce and human resource education fields: adult education, agricultural education, business education, human resource development, marketing education, occupational education, technology education, vocational special needs, and workforce development. These fields include some fields commonly associated with career and technical education.

Theoretical Framework

General Anxiety

The National Anxiety Foundation (2005) in Lexington, Kentucky, stated that everyone has or will experience anxiety at different stages in life, and that it can be quite normal in certain instances (<http://www.lexington-on-line.com/naf.whatare.html>). A positive side to anxiety is that it may keep one busy doing things that aid in success. For example, having anxiety due to the pressures to publish research for promotion and tenure purposes may prompt faculty members in higher education to avidly pursue their research agenda. But, the foundation also relates that sometimes anxiety can become a detriment to one's progress in life. High levels of anxiety can create roadblocks causing health problems or preventing one from attaining success in any field or profession. Since the reputation of prestigious

research universities depends on the amount and caliber of research produced, faculty members find themselves in the midst of a rubber band effect, juggling research endeavors and teaching assignments.

Educational studies in the past have generally concentrated on two types of anxiety, trait anxiety and state anxiety. Trait anxiety deals primarily with the nature of being, in that a person is prone to anxiety in all or many phases of life (Gaudry et al., 1975). State anxiety refers to situational anxiety, in that a condition is favorable to cause this emotion in certain people at a particular time, such as pressures to publish scholarly work within a department of higher education. Research anxiety, in this study, falls under the auspices of state anxiety and refers to the characteristics which a faculty or member perceives as discomforting, to the extent that productivity may be reduced. If research anxiety is approached as a case of state anxiety, then it is not perceived as a disorder that must be treated with medication or serious counseling, but which can be corrected through proper instruction and indoctrination in the methods of research. This indoctrination may occur in graduate programs or in mentorships upon attaining employment as a junior faculty member at a university. If faculty members do not perceive themselves as having a solid background in research methodology, there is a possibility that fear of rejection or simply the fear of using the wrong statistical procedure for a study to be peer reviewed may cause enough anxiety to decrease the amount and level of scholarly works produced.

The relationship between research anxiety and scholarly activity has practical implications in the field of education. The possibility of high anxiety levels resulting from perceived inefficiencies in research methodology or statistical procedures may have a direct impact on the amount and quality of scholarly productivity. The concept of research anxiety may have its roots in faculty members' educational experience during their graduate program component, but may also be due to a lack of practice or effort on the part of the faculty member. Also, depending on particular departmental expectations, restrictions placed on mentoring or collaboration with seasoned researchers may propagate research anxiety. It is no secret that pressures associated with the 'publish or perish' atmosphere in higher education weigh heavily upon the promotion and tenure process of faculty members (Blackburn & Bentley, 1993). These pressures may cause job dissatisfaction due to poor preparedness in graduate programs in the areas of research methodology and statistical procedural knowledge, high departmental expectations regarding research, and perceived personal barriers such as gender.

Faculty Anxiety

A higher education position is accompanied by multidimensional tasks. Faculty members are expected to engage in scholarly activity, which is usually equally or not so equally divided among research, teaching, and service (Miller & Sandman, 1994). Those entering the profession or looking for transfer possibilities at other universities

will notice how important an established research agenda is in meeting the qualifications for many of the positions, especially those positions at Research Extensive and Intensive Universities (Carnegie Foundation, 2000). Almost all of the position descriptions advertised in such periodicals as the Chronicle of Higher Education include a statement on research expectations. Competition among universities concerning funding has become intense and research agendas defining individual universities and departments are becoming trademarks for recruiting top students. The prestige that accompanies noted research programs places pressure on faculty members to stay abreast in the field as well as to maintain active research ventures.

Miller and Sandman (1994) described an engaged teacher as one who is knowledgeable or informed, and stated this knowledge comes from research. This description indicates that an effective teacher should also be an effective researcher, which may stretch the teacher in several different directions at once during the academic year. Also, most faculty members at universities handle assignments in graduate programs, further spreading the workday among research, undergraduate responsibilities, and aiding students through the thesis and dissertation process. Kelly and Warmbrod (1985) found that the most productive faculty members were full professors at high-prestige universities where the pressures of faculty productivity outweighed that of their counterparts at four-year colleges. Kotrlík, Bartlett, Higgins, and Williams (2002) reported faculty members working closely with doctoral students and that had access to graduate assistantships were more scholarly productive reflecting the educational culture of level one-research institutions. It makes sense that if there is more pressure to produce at universities, then research anxiety may be more prevalent.

Stress and workplace anxiety have become an accepted part of higher education. Several researchers examining selected characteristics of faculty members have found faculty experience anxiety due to research pressures, teaching loads, and time restraints associated with the job environment (Thompson & Dey, 1998). Researchers examined what faculty members perceived to be causes of workplace anxiety. Several variables overlap in the studies and most seem inherent to the field, like teaching loads and restricted funding.

Theoretical Model for Research Anxiety

Figure 1 displays three categories of variables that may combine to elevate levels of research anxiety of faculty members. The first category, *educational variables*, includes possible independent variables that have roots in the actual graduate and pre-employment experience of the faculty member. These variables are confidence in research practices, confidence in statistical procedures, math competence, computer competence, number of hours or credits in research/statistics courses taken in a graduate program, and the research prowess of the chair of the graduate committee.

In essence, this category explores the faculty members' preparedness upon entering higher education. Also, it looks at how faculty members perceive their math and computer skills upon entering a position in higher education. Blackburn, Horowitz, Edington, and Klos (1986) noted that faculty members who received strong or adequate instruction during their graduate work may experience less stress when engaging in research endeavors. The researchers also found lower anxiety levels could lead to higher confidence levels in their professional environment and that faculty members with higher self-esteem may become better at reducing stress levels from the pressures of higher education. These findings support the notion that a well-grounded graduate program may stem the propagation of research anxiety.

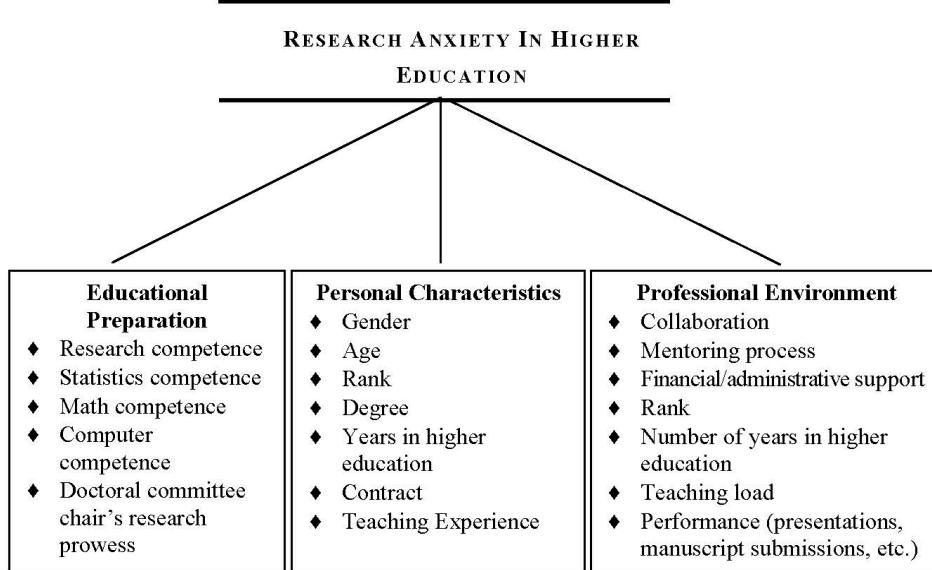


Figure 1. *Theoretical Model Showing Hypothesized Contributors to Research Anxiety*

The second category includes *personal characteristics* that may add to research anxiety. The individual's attributes could manifest themselves in the form of established perceptions in higher education and society of gender, age, and ethnic origin. Past researchers have noted that female and junior faculty members are lagging behind experienced male faculty members in research productivity and that female faculty members experienced higher levels of stress (Gmelch, Wilke, & Lovrich, 1986; Sax et al., 1996; Smith, Anderson, & Lovrich, 1995). Also, other authors have noted, due to job related stress, that minority faculty members perceive themselves to be behind in the productivity element of higher education when compared to their white

colleagues (Smith & Witt, 1993, Thompson & Dey, 1998).

The third category proposes that characteristics associated with the *professional environment* of faculty members may cultivate research anxiety. These characteristics include the pressure to publish in particular departments, options of collaboration with other researchers inside and outside the department, mentor relationships, financial/administration support of research efforts, rank, and class load (Levine, 1997). Higher education is usually broken down into three components, namely teaching, research and service. This category explores how environmental elements possibly add to anxiety when it comes to research productivity mixed with teaching and service.

The level of success in these three areas may be decreased or limited by anxiety caused when a faculty member is not confident they can design and carry out meaningful, accurate research (Seiler & Pearson, 1985). This anxiety toward research productivity may manifest itself in the graduate program of the prospective faculty member, be an inherent personal characteristic, or may be enhanced in a departmental atmosphere that does not encourage collaboration in research affairs or initiate a mentoring program for junior faculty. Understanding where research anxiety originates and how it is being propagated during the professional experience of a faculty member could provide pertinent information for administrators to better prepare and support potential and present faculty members in the area of research.

Summary

Table 1 contains a listing of 13 prominent studies regarding anxiety of faculty members in higher education. The studies dating from 1984 to 1998, representing the most recent studies on research anxiety, have been placed in order from latest to earliest. Authors in all 13 studies reported that research endeavors and pressures to publish scholarly research cause anxiety in faculty members. It is the only variable found to be related to anxiety levels of faculty in all of the studies, but the focus of each study differed which may be the reason other variables did not appear to be a significant stressor. Even if that were the case, it is still evident that research and publishing pressures give cause for concern and merit further investigation as to how to alleviate anxiety associated with these factors.

This study addresses research anxiety of human resource education faculty. This population was selected because the authors have personally observed substantial research anxiety among various faculty across the country as they conducted research and worked with researchers in various sectors of this field. No recent study had addressed research anxiety in this population. Although minimal research had been conducted in the area of research anxiety of human resource education faculty, research from other fields cited in this manuscript indicated that similar research anxiety may exist in human resource education.

Table 1. *Top Five Variable Categories Related To Anxiety of Faculty Members*

Findings of 13 Prominent Research Studies	Top 5 Stress Categories in Literature				
	Self-expectations	Time Restraints	Research, Funding & Pressures to Publish	Professional Status: Tenure Salary & Rank	Personal Variables: Gender, Age Ethnic Origin
Thompson & Dey (1998)	x	x	x	x	x
Gertrude et al. (1996)		x	x	x	x
Marcy (1996)			x	x	x
Smith et al. (1995)	x	x	x	x	x
Smith & Witt (1993)		x	x		x
Burns & Gmelch (1992)	x		x		x
Grant (1991)		x	x		
Perlberg & Kremer- Hayon (1988)			x	x	
Richard & Krieshok (1989)			x	x	
Keinan & Perlberg (1987)	x	x	x	x	x
Gmelch et al. (1986)	x	x	x	x	x
Seiler & Pearson (1985)	x	x	x		x
Gmelch et al. (1984)	x	x	x	x	x

Method

Population and Sample

The target population was human resource education faculty members holding academic appointments within research universities. The accessible population included faculty members holding academic appointments at the rank of lecturer or higher within departments associated with the University Council for Workforce and Human Resource Education (UCWHRE). This population was selected because it was the only reliable and substantially accurate listing available of human resource education faculty and also because UCWHRE institutions have extensive or intensive research programs. The sample was randomly chosen from the frame of faculty members associated with UCWHRE. It was determined, by visiting university home pages, and through personal communication with individual departments, that the

population frame for this organization was 343 faculty members (http://www.hre.uiuc.edu/ucwhre/Directory_UCWHRE.pdf). The 20 member universities of the UCWHRE are listed in Table 2.

Cochran's sample size formula, including the small population correction formula, was used to calculate a minimum required sample size of 88 faculty members ($a = .05$, estimate of $SE = .03$, estimate of $SD = .83$) for the study (Cochran, 1977). Since the researcher anticipated a response rate in the 50-60% range, the sample size for the study was set at 156.

Table 2. *The University Council for Workforce and Human Resource Education, Participating Universities.*

◆ Auburn University	◆ Pennsylvania State University	◆ University of Minnesota
◆ Colorado State University	◆ Southern Illinois University	◆ University of Missouri-Columbia
◆ Louisiana State University	◆ Texas A&M University	◆ University of Nebraska-Lincoln
◆ University	◆ University of Arkansas	◆ University of Tennessee
◆ North Carolina State University	◆ University of Georgia	◆ University of Wyoming
◆ Ohio State University	◆ University of Idaho	◆ Virginia Polytechnic
◆ Oklahoma State University	◆ University of Illinois	Institute and State
	◆ University of Kentucky	University

Instrumentation

The *Higgins-Kotrlík Research Anxiety Inventory* was developed via a thorough review of existing research and based on the theoretical model presented earlier. A questionnaire consisting of four sections was designed to measure faculty members' perceptions regarding research anxiety, and was configured into a booklet format. Questions in sections one, two, and three were rated using a five point Likert-type scale with numerical ratings as follows: 1- strongly disagree, 2- disagree, 3- neutral, 4- agree, 5- strongly agree. **Section 1** contained 18 items focusing on the concept of research anxiety. This section examined the perceptions of the faculty members regarding how confident they are in designing and conducting relevant research and how they feel their research is accepted by their peers. **Section 2** contained 18 items focusing on the faculty member's professional research environment. It examined the actual working environment of the faculty member as it relates to support from the administration and other faculty members as well as examining the amount of pressure placed on the faculty members to produce scholarly research. **Section 3** of the instrument contained 14 items focusing on the educational preparation of the faculty members in the area of research. The questions were intended to investigate the effectiveness of the graduate programs completed by the faculty members regarding

research procedures and statistical methodology. **Section 4** contained 11 items designed to collect pertinent demographic information regarding the faculty members participating in the study. The questions in this section focused on the status of the participants with regard to employment in higher education.

A panel of experts in the field reviewed the instrument for face and content validity. Their comments were beneficial in revising the instrument. A pilot test of the instrument was conducted to assess the validity (face and content) and reliability of the *Higgins-Kotrlík Research Anxiety Inventory* and the other two scales of the instrument. The pilot test was conducted with 100 UCWHRE faculty who had not been selected in the random sample for the study. This process aided the researcher in identifying items in the instrument that needed modification. The pilot test attempted to identify any possible problems associated with the design of the instrument as well as any problems in the data collection procedures. Minor modifications were made to the instrument based on the analysis of the data from the pilot study.

Data Collection

Data collection was conducted using recommendations by Dillman (1978). The faculty members received a packet containing a cover letter explaining the intent and significance of the study, a questionnaire, and a stamped, self-addressed envelope. Those who did not respond to the first mailing within a two week time period received a subsequent mailing containing the identical contents used in the initial mailing. A telephone follow-up was conducted with a random sample of 50 individuals in the non-respondent category two weeks after the second mailing. The anonymity of all respondents was guaranteed, but they were made aware of the coding system to guard against duplicate responses.

Data Analysis

A *t*-test procedure was used to determine if differences existed between the respondent group and those who participated in the telephone follow-up process on the key variables (graduate preparation, personal characteristics, and professional environment) of the study. The grand mean scores of the three primary variable scales within the instrument were used for the *t*-test procedure. Since no significant differences existed, the data were combined for further analyses. Descriptive statistics were used to describe the demographic and personal variables as well as all the data from three scales of the instrument. The alpha level for the study was set *a priori* at .05. Pearson, Spearman, and point-biserial correlations were used to address the correlations described in objective 3. Forward multiple regression was used for objective 4.

Findings

The sample consisted of 156 university faculty members. Of those who were sampled, 97 returned the survey and a telephone follow-up garnished another eight responses, totaling 105 completed instruments (67%). All of the responses ($N=105$) were used for the analyses required by the objectives of this study. Table 3 shows, through the employment of independent samples t -tests, that there were no significant differences between the mail and telephone responses on the *Higgins-Kotrlík Research Anxiety Inventory*, the Professional Environment Inventory, or the Educational Preparation Inventory.

Table 3. *Comparison of Respondents and Non-Respondents on the Higgins-Kotrlík Research Anxiety Inventory, The Professional Environment Inventory, and The Educational Preparation Inventory*

Scale	Respondents ^a		Non-Respondents ^b		<i>df</i>	<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
<i>Higgins-Kotrlík Research Anxiety Inventory</i>							
Professional Environment Inventory	41.02	10.99	43.05	8.88	103	.57	.46
Educational Preparation Inventory	59.00	10.86	59.86	11.64	103	.22	.78
<i>Educational Preparation Inventory</i>							
	50.61	8.42	50.63	6.14	103	.01	.33

^a $n = 97$ (mail). ^b $n = 8$ (telephone).

Demographic Characteristics of UCWHRE Faculty Members

Objective One was to explore selected demographic characteristics of the faculty included in the study. Table 4 shows the age, number of years employed in higher education and rank of the faculty members. The average age of the faculty members was 52.33, with a range from 38 to 70 years. The average number of years employed in higher education was 18 years with a range from 2 to 37 years. The table also contains the average amount of time that participating faculty members reported their departments allocated them personally for conduct teaching, research, service, and administrative duties. The respondents reported that the mean percent of appointments was 53.70% for teaching, 21.67% for research, 14.21% for service, and 8.83% for administrative tasks.

Table 5 displays the data on the other demographic and personal variables. Males made up 74 (72.10%) of the sample with the remaining 30 (28.80%) respondents being female. Fifty (48.10%) participants held the rank of full professor, 32 (30.80%) were classified as associate professors, 19 (18.30%) were listed as assistant professors, 1 (1.00%) was categorized as a lecturer, and 2 (1.90%) of the respondents

labeled themselves as administrative personnel. Of the participants, 65 (63.10%) held a Ph.D., 37 (35.90%) held an Ed.D., and one (1.00%) respondent reported holding a Master's degree.

Table 4. *Age, Number of Years Employed in Higher Education and Time Allocated for Teaching, Research, Service and Administrative Duties*

Demographic	M	SD	Range
Age (years)	52.33	7.51	38-70
Years employed in Higher Education	18.55	8.88	2-37
Average percentage of appointment allocated to:			
Teaching	53.70	26.00	0-100%
Research	21.67	15.92	0-60%
Service	14.21	15.79	0-95%
Administrative	8.83	24.30	0-100%

Note. N = 105

Regarding the possibility of being influenced by a mentoring program, 70 (66.70%) faculty members reported that there departments had no official mentoring program, while 34 (32.7%) responded that there was an unofficial mentoring system that they were either the benefactor or facilitator. Fifty-nine (56.20%) of the faculty members reported they held nine month contracts, as opposed to 45 (42.90%) faculty members holding a 12 month contract. Almost one-third (32 or 30.50%) taught a research methods course, and 6 (5.70%) taught a statistics course.

Research Anxiety of UCWHRE Faculty

The second objective of the study was to explore the level of research anxiety in UCWHRE faculty members. The researcher developed the *Higgins-Kotrlík Research Anxiety Inventory* to measure the construct of research anxiety in higher education. Factor analysis was used to determine if the items in the represented a single construct, with all items forced into one main construct. All of the items loaded at or above .3, which is considered to be the minimum acceptable factor loading level (Hair, Anderson, Tatham, & Black, 1998). The item with lowest loading of .31 was "When reading research articles, I am apprehensive about being able to synthesize the findings". The item with the highest loading of .78 was "I am confident when conducting the data analysis of a study for possible publication in a refereed research journal". Table 6 displays the one factor solution, with the items arranged in order by factor loading level.

The responses to the 18 item inventory, based on the five point Likert type scale used, ranged from 19 to 68. The top quartile, 49-68, represents high levels of research anxiety, the two middle quartiles, 34-48, represent moderate levels of research anxiety, and the bottom quartile, 19-33, represents low levels of research

anxiety (see Table 7).

Table 5. Professional Demographic Information of UCWHRE Faculty Members

Professional Variables	F	%
Degree Held		
Master's	1	1.00
Ed.D	37	35.90
Ph.D.	65	63.10
Rank		
Instructor/lecturer	1	1.00
Assistant Professor	19	18.30
Associate Professor	32	30.70
Full Professor	50	48.10
Administrative	2	1.90
Official Mentoring Program		
Department offered an official mentor program	34	33.30
Department did not offer an official mentor program	70	66.70
Type of contracts held		
9 month academic contract	59	56.10
12 month academic contract	45	43.90
Research methods		
Taught course	32	31.50
Did not teach course	72	68.50
Statistics methods		
Taught course	6	5.70
Did not teach course	98	94.30
Gender		
Male	74	71.20
Female	30	28.80

Table 8 shows the responses to the 18 items contained in the scale. Item 16, "I need to improve my statistical skills", had the highest mean score of 3.68 ($SD = 1.01$). Item 6, "I am confident when writing the findings for a research study", had the lowest mean score at 1.62 ($SD=.64$), indicating a lack in confidence when writing the findings for a research study. The Cronbach's α for the scale was .89. Litwin (1995) reported that an α level above $\alpha=.70$ represents good reliability. The scaled date from the *Higgins-Kotlik Research Anxiety Inventory* revealed an overall summated mean of 41.38. Using the research anxiety levels in Table 7, the interpretation of the means indicate a moderate level of research anxiety existed among UCWHRE faculty members.

Table 6. One Factor Solution for the Higgins-Kotrlík Research Anxiety Inventory

Item	Factor Loading
I am confident when conducting the data analysis of a study for possible publication in a refereed research journal	.79
I am confident when preparing a research methodology of a study for possible publication in a refereed research journal.	.78
When I conduct research, I worry about the possibility of using incorrect data analysis.	.73
I am confident when writing the findings for a research study.	.70
When I conduct research, I fear that it is poor compared to others in my field.	.69
When working on a research project, I experience anxiety	.68
I am confident when writing the conclusions of a study for possible publication in a refereed research journal	.64
I would (or do) have difficulty reviewing manuscripts for refereed research journals	.64
I often feel uncomfortable when discussing research methods.	.64
I am confident when synthesizing a theoretical base of a study to be published in a refereed research journal.	.63
It bothers me that my research may not be judged as acceptable by reviewers for research journals.	.62
I am confident when stating the purpose and objectives of a study to be published in a refereed research journal.	.56
I need to improve my statistical skills.	.51
It bothers me that my research may not be judged as quality work.	.49
When I conduct research, I worry about the possibility of the manuscript not being accepted for publication.	.47
I need to improve my research skills.	.43
I produce research that is respected by my peers.	.423
When reading research articles, I am apprehensive about being able to synthesize the findings	.31

Table 7. Research Level of University Council for Workforce and Human Resource Education Faculty Members

Respondent Range	Quartiles	Research Anxiety Category
19-33	0-25%	'Low' level of research anxiety
34-48	26-75%	'Moderate' level of research anxiety
49-68	76-100%	'High' level of research anxiety

Table 8. Responses to the Higgins-Kotrlík Research Anxiety Inventory

Item	Higgins-Kotrlík Research Anxiety Inventory Items	M	SD
16	I need to improve my statistical skills.	3.68	1.01
15	I need to improve my research skills.	3.37	1.09
11	It bothers me that my research may not be judged as quality work.	2.85	1.20
9	It bothers me that my research may not be judged as acceptable by reviewers for research journals.	2.81	118
18	It bothers me that my research may not be judged as acceptable by reviewers for research journals.	2.69	1.20
12	When working on a research project, I experience anxiety.	2.64	1.37
14	I often feel uncomfortable when discussing research methods.	2.45	1.22
10	When I conduct research, I worry about the possibility of using incorrect data analysis.	2.33	1.12
3 ^a	I am confident when synthesizing a theoretical base of a study to be published in a refereed research journal.	2.05	.88
13	When I conduct research, I fear that it is poor compared to others in my field.	2.04	1.17
5 ^a	I am confident when conducting the data analysis of a study for possible publication in a refereed research journal.	2.01	.97
8	When reading research articles, I am apprehensive about being able to synthesize the findings	1.95	.97
1 ^a	I produce research that is respected by my peers.	1.90	.80
4 ^a	I am confident when preparing a research methodology of a study for possible publication in a refereed research journal.	1.84	.90
17	I would (or do) have difficulty reviewing manuscripts for refereed research journals.	1.78	.89
7 ^a	I am confident when writing the conclusions of a study for possible publication in a refereed research journal I am confident when stating the purpose and objectives of a study to be published in a refereed research journal.	1.72	.77
6 ^a	I am confident when writing the findings for a research study.	1.67	.63

Note. N = 105. Scale for the Higgins-Kotrlík Research Anxiety Inventory is as follows: 1-strongly disagree, 2-disagree, 3-undecided, 4-agree, 5-strongly agree. Summated Mean = 41.38.

^aItems have been reverse scored.

Professional Environment of University Faculty Members

Objective two also sought to explore the professional environment of the faculty members that participated in the study. The instrument contained a scale, the Professional Environment Inventory, which was constructed to assess the current professional climate that the faculty members are confronted with in higher

education. Table 9 displays the responses to the 18 item scale. The high mean of 4.10 belonged to "My department places too much emphasis on teaching." The faculty members agreed that their departments placed too much emphasis on teaching. The low mean, 1 .89, was for "My department offers desirable teaching assignments as a reward for publishing in refereed research journals." The respondents strongly disagreed that their departments offered desirable teaching assignments as a reward for publishing in research journals. The overall reliability for this scale was $\alpha = .85$. The mean Professional Environment Inventory score was 56.07 out of a possible 70 ($SD = 10.86$).

Educational Preparation of University Faculty Members

The third portion of objective two was to examine the graduate educational preparation of the respondents. The final scale of the survey, The Educational Preparation Inventory, was constructed to give the researcher data that would define the faculty members' perceptions of their personal graduate experience. Table 10 displays the responses to the 14 item scale. Of the responses, "My presentation skills were adequate for success in higher education" had the highest mean of 4.39. The respondents agreed that their graduate experience provided adequate preparation regarding presentation skills. The lowest mean of 2.22 was for "I published research in peer reviewed journals with other students during my graduate course work." The faculty members disagreed that they published research with other students during their graduate experience. The Cronbach's Alpha reliability coefficient for this scale was .79. The mean Education Preparation Inventory score was 50.61 out of a possible 70 ($SD = 8.25$).

Relationship Between Selected Demographic Variables and Research Anxiety

Objective three sought to determine if significant correlations exist between selected demographic variables and the research anxiety of University Council faculty members. The demographic variables in question were rank, gender, age, mentoring, the number of tenure track faculty members in the department, type of contract held, highest degree held, research methods classes taught, statistics class taught, and years employed in higher education. The coefficients were interpreted using Davis'(1971) set of descriptors.

The correlation coefficient for rank was $r_s = -.38$, which is a moderate negative correlation that suggests as one progresses in rank in higher education, research anxiety declines. Whether a faculty member had a formal research mentor (dichotomous) had a low correlation coefficient of $to = .21$, suggesting that a formal mentoring program helped alleviate research anxiety. The variable age had a low correlation coefficient of $-.19$, revealing that as one ages, research anxiety lessens. The variables regarding teaching research and statistics courses had coefficients of

Table 9. *Responses to the Professional Environment Inventory*

Item	Professional Environment Inventory Items	M	SD
3 ^a	My department places too much emphasis on teaching.	4.10	.91
18	I involve students, as co-researchers, in my efforts to publish in refereed research journals.	3.90	.99
6 ^a	My department discourages collaboration on research projects with other faculty members within my department.	3.90	1.17
12	My peers recognize my efforts to publish in refereed research journals.	3.72	.93
13	My peers support my efforts to conduct research.	3.70	.96
14	My university administration recognizes my efforts to publish in refereed research journals.	3.69	1.01
15	My university administration supports my efforts to conduct research.	3.56	1.07
1 ^a	My department places too much emphasis on research.	3.51	1.15
5	My department promotes collaboration on research projects with other faculty members outside my department.	3.48	1.17
4	My department promotes collaboration on research projects with other faculty members within my department.	3.48	1.15
16	My department encourages collaboration when publishing refereed journal manuscripts.	3.44	1.09
2 ^a	My department places too much emphasis on publishing in refereed research journals.	3.37	1.22
10	My department provides travel money to support my research and publishing endeavors.	3.07	1.29
11	My department has asked me to serve as a research mentor for new faculty members.	2.90	1.32
17	A senior faculty member has served as a research mentor to me.	2.55	1.41
7 ^a	My teaching load often makes it difficult to find time for conducting research projects.	2.46	1.24
9	My department adequately finances my research agenda.	2.35	1.13
8	My department offers desirable teaching assignments as a reward for publishing in refereed research journals.	1.89	.89

Note. N = 105. Scale for the Professional Environment Inventory is as follows: 1-strongly disagree, 2-disagree, 3-undecided, 4-agree, 5-strongly agree. Summated M = 56.07 (SD = 10.86)

^aItems have been reverse scored.

Table 10. *Responses to the Educational Preparation Inventory*

Item	Educational Preparation Inventory Items	M	SD
5	My presentation skills were adequate for success in higher education.	4.39	.64
6	My library skills were adequate for success in higher education.	4.20	.78
7	My doctoral committee chair was a highly respected researcher in his/her field.	4.06	1.08
8	My doctoral committee chair adequately advised students on research projects.	4.04	1.11
1	My research methodology skills were adequate for success in higher education.	4.03	.83
9	My doctoral committee chair encouraged me to publish research in peer reviewed research journals.	4.00	1.18
4	My computer skills were adequate for success in higher education.	3.96	.95
3	My mathematic skills were adequate for success in higher education.	3.94	.82
2	My statistics skills were adequate for success in higher education.	3.80	.95
11	My doctoral committee chair was a prolific publisher.	3.43	1.32
10	My doctoral committee chair collaborated with me on publishing research manuscripts.	3.03	1.52
14	I published research in peer reviewed journals on my own during my graduate course work.	2.76	1.44
12	I published research in peer reviewed journals with other faculty members during my graduate course work.	2.75	1.47
13	I published research in peer reviewed journals with other students during my graduate course work.	2.22	1.27

Note. N = 105. Scale for the Educational Preparation Inventory is as follows: 1-strongly disagree, 2-disagree, 3-undecided, 4-agree, 5-strongly agree. Summated M = 50.61 (SD = 8.25).

$r = .35$ and $= .21$, indicating moderate and low correlations, respectively. Interestingly, these coefficients suggest that those faculty members who teach research methods and statistics courses (dichotomous) experience higher anxiety levels when it comes to research. The number of years employed in higher education had a coefficient of $r = -.38$, suggesting that as the years of employment increased, research anxiety decreased. No relationships existed between research anxiety and gender, number of tenure track faculty in the respondent's department, highest degree held (Ed.D. or Ph.D.), and type of contract (9 or 12 months). Table 11 displays the relationships between research anxiety and the selected variables.

Table 11. *Correlations Between the Higgins-Kotrlík Research Anxiety Inventory and Selected Demographic Variables.*

Demographic Variables	<i>Higgins-Kotrlík Research Anxiety Inventory</i>			
	<i>r</i>	Interpretation	<i>P</i>	<i>N</i>
Rank ^a	-.38	Moderate	<.01 ^d	104
Years of employment in higher education ^b	-.37	Moderate	<.01 ^d	104
Number of tenure track faculty members in the department ^b	NS ^e	None	.31	102
Age ^b	-.19	Low	.02 ^d	104
Gender ^c	NS ^e	None	.09	102
Highest degree held ^c	NS ^e	None	.21	103
Type of contract ^c	NS ^e	None	.15	104
Mentor Program ^c	.21	Low	.01 ^d	104
Taught research methods courses ^c	.35	Moderate	<.01 ^d	104
Taught statistics courses ^c	.21	Low	.01	104

Note. Interpretations according to Davis's (1971) descriptors of association: .01-.09 (negligible), .10-.29 (low), .30-.49 (moderate), .50-.69 (substantial), .70-.99 (very high), and 1.0 perfect.

^aSpearman's Rho. ^bPearson's Product Moment. ^cPoint Biserial. ^dSignificant correlations.

^e=Not significant.

Model to Explain Variance in the Higgins-Kotrlík Research Anxiety Inventory

Objective four sought to determine if selected variables explain significant portions of variance in research anxiety in University Council faculty members. Using the forward multiple regression procedure, the researcher explored the amount of variance selected independent variables (educational preparation, professional environment, gender, rank, years employed in higher education, and age) explained in research anxiety associated with UCWHRE faculty members. Six potential explanatory variables were entered into the analysis, which resulted in the analysis having 17 cases per independent variable. According to Hair, Anderson, Tatham, & Black, (1998) "Although the minimum ratio is 5 to 1, the desired level is between 15 to 20 observations for each independent variable to ensure . When this level is reached, the results should be generalizable if the sample is representative." (P. 166)

The collinearity test revealed that no multicollinearity existed in the regression model, as all VIF values were under 2.00 (Neter, Kutner, Nachtsheim, & Wasserman, 1996). A histogram aided in the diagnosis which confirmed the normality of the distribution. The regression analysis revealed that only educational preparation, years employed in higher education, and professional environment were significant explanatory variables. These three variables explained 48% of the variance found in the dependent variable, research anxiety,

which is a large effect size according to Cohen (1988). As educational preparation level, years employed in higher education, and quality of professional environment increased, the UCWHRE faculty members' research anxiety decreased. Table 12 displays the regression analysis.

Table 12. *Forward Multiple Regression Analysis of Whether Selected Variables Explained the Variance in Research Anxiety*

Source of Variation	SS	df	MS	F	P
Regression	5815.47	3	1938.49	29.93	<.01
Residual	6282.39	97	64.76		
Total	12097.86	100			
Variables that entered the equation			R^2	Cum	b
Educational Preparation			.30	-.50	<.01
Years employed in higher education			.45	-.37	<.01
Professional Environment			.48	-.17	.02
Variables that did not enter the model				t	P
Rank				-.68	.49
Gender				.10	.91
Age				.38	.70

Conclusions

The first objective of the study was to determine selected demographic characteristics (gender, age, rank, highest degree held) of university faculty members. The typical UCWHRE faculty member was male, held the rank of full professors, possessed a doctoral degree, and was 52 years old.

Objective two was to determine if research anxiety existed in university faculty members. The data from the *Higgins-Kotrlík Research Anxiety Inventory* revealed that UCWHRE faculty have moderate levels of research anxiety. Most faculty members felt a need to improve both research and statistics skills regarding research in higher education and were not confident when writing the findings to their studies. Faculty members also were not confident that their peers respect their research. This conclusion is supported by Thompson and Dey (1998) who found that faculty experience anxiety due to research pressures as well as teaching loads and time restraints associated with the job environment.

The third objective explored if significant correlations existed between the independent variables (educational preparation, selected personal characteristics, and professional environment) and the research anxiety of university faculty members. *Moderate* correlations exist between research anxiety and rank, research methods

courses taught, and years of employment in higher education. As rank and years experience in higher education increase, research anxiety decreases while research anxiety increases for those who teach research methods classes. *Low* correlations exist between research anxiety and whether the faculty member participated in a research mentoring program, the age of the faculty member, and experience teaching statistics courses. As age increases, research anxiety decreases while research anxiety increases for those who have a mentor program in their university and for those who teach statistics classes. The relationship between having a faculty mentor and research anxiety supports Levine (1997) who indicated that mentoring relationships may be related to research anxiety. No relationships exist between research anxiety and gender, the number of tenure track faculty members within their department, and type of contract currently held (9 or 12 months). The fact that gender was not related to research anxiety does not appear to support several studies that found that female faculty experience more stress than men (Gmelch, Wilke, & Lovrich, 1986; Sax et al., 1996; Smith, Anderson, & Lovrich, 1995).

Objective four was to determine if selected variables explain significant portions of variance regarding research anxiety in university faculty members. Educational preparation, professional environment, and years employed in higher education combine to explain a large amount of variance in research anxiety. As educational preparation level, years employed in higher education, and quality of professional environment increases, UCWHRE faculty members' research anxiety decreases. No other variables studied explain research anxiety.

The research model developed for this study was generally supported by the data from this study. Both educational preparation and professional environment emerged as strong explanatory variables in the regression analysis, explaining a large proportion of the variance in research anxiety. Although several of the personal characteristics were correlated with research anxiety, two were not related to the dependent variable in this study, namely, gender and contract length.

Implications and Recommendations

This exploratory study revealed that there is indeed anxiety in higher education with regards to scholarly productivity. The data suggest that research anxiety may be lessened by certain personal characteristics such as holding a higher rank at a university, years of experience in higher education, and advance in age. The results also show that as a faculty member gains experience in higher education, the stresses of the research process lessen. The results also suggest that young faculty members are more prone to experience research anxiety. Since the professional environment is also related to research anxiety, administrators may wish to take steps to help alleviate the research anxiety experienced by junior faculty.

The educational preparation was a significant contributor to research anxiety. Those who perceive their graduate programs prepared them for a position in higher

education experience less research anxiety. Administrators may want to ensure that graduate students are introduced to the publishing process and urged to take part in research projects during their graduate experience. The faculty members reported that they did not, for the most part, publish with other faculty members, other students, or on their own during their graduate experience. A better graduate preparation and a more collaborative, friendly department may be two factors to consider when improving the scholarly productivity of faculty members. Universities that prepare potential faculty members may also be able to reduce the research anxiety experienced by their graduates who are employed in UCWHRE institutions by improving the quality of their research preparation.

Further Research

Future researchers may want to explore the perceptions of graduate students currently enrolled in research universities regarding scholarly productivity and the anxiety that accompanies it. Also, a closer look at perceptions of faculty members who have taken part in an official or unofficial research mentoring program compared to those who did not have this option may reveal the significance of mentoring new faculty members regarding research anxiety. Studying the correlations between publishing record and research anxiety may also prove instrumental in determining variables associated with research anxiety.

The research anxiety construct should be studied further. Additional factor analysis of the *Higgins-Kotrlík Research Anxiety Inventory* data should be conducted to determine if there are any underlying subconstructs within the research anxiety construct. Also, even though the *Higgins-Kotrlík Research Anxiety Inventory* has sound psychometric qualities, attempts should be made to improve the measurement ability of this instrument.

Several other questions related to research anxiety should be addressed.

- What is the current status of the publishing process in human resource education fields?
- Are appropriate publishing outlets available for the type of research that are being conducted?
- Do HRE faculty have specific problems or an easier time getting published or promoted and tenured than those in other fields?
- What are the acceptance rates and the level of “rigor” in human resource education publications?
- What is the status of human resource education programs in the academy with special emphasis on career and technical education? Since some career and technical teacher education departments and programs have been discontinued or heavily restructured by universities as a result of a decrease in federal funding for research and development, there could be a

relationship between the status of these programs and the research anxiety of these faculty.

This study is like so many others. It has spawned several research questions that need to be answered by future research endeavors.

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Career and Technical Education Research Field Reviewers for Volume 31

The individuals listed below graciously contributed their time and expertise to the constructive review of manuscripts submitted to *Career and Technical Education Research* during the calendar year 2006. Double-blind, peer reviews are critical and each of these individuals are commended for their outstanding performance and contributions to career and technical education research.

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