2014

DECA Membership and Its Effect on Grade Point Average as an Indicator of Academic Success

Michael F. Kosloski Jr.
Old Dominion University

J. M. Ritz
Old Dominion University

Original Publication Citation

Kosloski, M. F., Jr., & Ritz, J. M. (2014). DECA membership and its effect on grade point average as an indicator of academic success. C*areer and Technical Education Research*, *39*(2), 151-169. https://doi.org/10.5328/cter39.2.151

Career and Technical Education Research, 39(2), pp. 151-169
DOI: 10.5328/cter39.2.151

DECA Membership and Its Effect on Grade Point Average as an Indicator of Academic Success

Michael F. Kosloski, Jr.
John M. Ritz
Old Dominion University

Abstract

Stakeholders in career and technical education declare the value of applied learning through corresponding co-curricular student organizations. However, there is limited empirical evidence to support the notion that student organizations help participants to achieve academic gains. This study examined the levels of engagement in DECA's co-curricular activities, years of membership in DECA, and the impact of multiple years of membership on members' grade point averages in high school. Two-hundred twelve students across Virginia (n = 212) completed an inventory describing their involvement with DECA and provided entry, midpoint, and exit grade point averages. It was determined that DECA members showed significant increases in overall academic grade point averages during their memberships, and multiple years of membership amplified the increases. It was also determined that students who were more engaged in DECA's annual activities showed greater academic gains than did their more passive member counterparts.

Keywords: Career and technical student organizations, career and technical education, cte, DECA, academic gains

Introduction

Career and technical education (CTE) is a program of study that offers a sequence of courses that provide individuals with the academic and technical knowledge and skills they need to prepare for further education and careers (Brustein, 2006). Roughly 98% of high school students across the United States take at least one CTE course during their high school career, and approximately one in four takes three or more courses in a concentrated program area (United States Department of Education, 2008).

Most CTE programs consist of three modes of instruction: classroom instruction, cooperative education, and the career and technical education student organization (CTSO). Each of the program areas has a co-curricular student organization founded on industry/education standards and/or specific course curricula. There are seven nationally recognized CTE program areas and eight CTSOs (Gordon, 2008).

These co-curricular organizations provide students unique learning opportunities inside and outside of what takes place in the traditional classroom. As an element of the curriculum, students are offered opportunities for leadership development and service through a wide variety of activities ranging from programmatic efforts at the local level to collaborative efforts at the national level. They also have the opportunity to take part in competitive events, which expand their experiences in leadership and job related competencies corresponding to their program

(Gordon, 2008). Some of the positive traits developed from student organizations include teamwork, decision-making, competitive proficiency, leadership, community awareness, career awareness, and personal and social development (Alfeld et al., 2007).

The co-curricular student organization for marketing education is DECA, An Association of Marketing Students—formerly known as Distributive Education Clubs of America (Berns, 1996). Specific to marketing education, more than 190,000 students become members of the national student organization (DECA) each year, with hundreds of thousands more participating at the local level. The purpose of DECA is to reinforce nationally recognized curriculum standards and provide realistic educational experiences with respect to marketing, management, and entrepreneurship. Student organization experiences offer a method of instruction not necessarily replicated in the classroom (DECA, Inc., 2013).

Student members participate in a variety of programmatic activities that support, reinforce, and enhance the marketing curricula providing them with engaging venues for learning career, technical, and academic skills and knowledge. The No Child Left Behind Act (2001) established a political climate which has called for an increased emphasis on academic skills, specifically in the areas of science, mathematics, reading, social studies, and technology (United States Department of Education, 2002). As a result, career and technical education has been charged with providing a greater level of amalgamating academic knowledge in the career and technical education curricula, as well as developing career readiness. Under prior versions of career and technical education (vocational education) legislation, and now the current version of the Carl D. Perkins Career and Technical Education Act of 2006, it has been mandated to integrate career and technical skills and knowledge with academic skills and knowledge, showing accountability for this integration (Brustein, 2006). Given the emphasis in today's public schools on academic or core courses, and given the number of students engaged in co-curricular student organizations, a question posed is, "Does participation in co-curricular organizations impact student's academic progress?"

Literature Review

Distinctions have been drawn between traditional and vocational education for more than a century. Federal acts and governmental reports have continuously molded CTE. As a result of evolving legislation, CTE can no longer be an alternative educational venue. Rather, it necessarily needs to integrate academic rigor with occupationally specific skills and knowledge.

Vocational education was formally recognized through legislation in 1917 with the Smith-Hughes Act, while CTSOs were formally introduced with the George-Barden Act of 1946. Many legislative acts had played a role in the evolution of CTE since that time. In 1984, Congress passed the Carl D. Perkins Vocational Education and Applied Technology Act, a benchmark for present day CTE federal legislation. The original Perkins Act focused on the improvement of vocational programs and provided more access to those programs to students with special needs (Lynch, 2000). The Perkins Act was reissued in 1990 with a continued effort toward program improvement (Hoachlander, 2005). Significant additions were added to the subsequent reauthorization in 1998, and it not only continued to emphasize program improvement, but it also created an emphasis on the integration of academics and occupationally specific skills and knowledge (Brustein, 2006; Meeder, 2006).

Federal legislation has come full circle with respect to CTE. At the turn of the 20th century, legislation was enacted to prepare students to enter occupationally specific careers (Plank,

DeLuca, & Estacion, 2005). Current-day legislation has dictated a greater integration of the practical skills needed in the workplace with academics into the CTE curricula (Stone, Kowske, & Alfeld, 2004). CTE must continue to infuse academic skills and knowledge into the curricula. Without such integration, policymakers may reduce funding for CTE and will continue to shift those resources into other academic areas and programs (Kazis et al., 2005).

Career and Technical Education and Academic Reinforcement

Beginning with the 1998 reissue, Perkins legislation has required that CTE support and reinforce core academic skills and knowledge (Meeder, 2006). However, because this has been mandated only in the last decade or two, there are limited empirical data to affirm the academic results of this mandate. Only in recent years has research begun to measure the effectiveness of CTE in the academic arena (Brand, 2005).

Stakeholders of CTE assert that academic rigor has always been present in the curricula. However, academic rigor is often implicit both for students and teachers (Association for Career and Technical Education, 2008; Stone, Alfeld, Pearson, Lewis, & Jensen, 2006). In fact, in a study comparing CTE course takers to those who did not take a CTE course, Lekes et al. (2007) concluded that students who took courses in CTE scored significantly higher on the Reading for Information subtest of the ACT WorkKeys (a job skills assessment system). The National Center for Education Statistics (2008) found that CTE completers reported higher postsecondary grade point averages as compared to their non-CTE counterparts. They stated that this pattern was detectable at the certificate, associate's degree, and bachelor's degree levels.

In a yearlong experimental study of intentionally infusing mathematics into several career and technical education courses, Stone et al. (2006) concluded that the practical application of mathematics into the curricula significantly increased learners' skills as measured by standardized tests. In addition, they noted that occupational skills and knowledge did not decrease. In a similar pilot study, Park (2010) conducted a study integrating reading literacy strategies with both CTE and non-CTE learners. Park concluded that when learning reading in the context of a CTE subject, students scored significantly higher on reading comprehension and vocabulary scores than those of their non-CTE counterparts. Park attributed the improvement in reading scores to relevancy and authenticity. Both studies indicated that contextual learning played a key role in mathematics and literacy improvements.

A recent study produced by Harvard Graduate School posited that the implementation of contextual elements provide a more effective learning environment than do our traditional learning environments (Symonds, Schwartz, & Ferguson, 2011). Their proposed model is similar to those found in most CTE programs.

Level of Academics

Students who enter into a CTE focus often anchor their course taking with related academic course work. The National Center for Education Statistics (2008) found that academic achievement, as determined by exit test scores, was reinforced and enhanced. In addition to reinforcing levels of academics, they also found a correlation between the number of occupational courses taken and the number of academic courses taken. The more occupational courses learners took in high school, the more academic courses they took, as well (Levesque et al., 2008). Silverberg, Warner, Fong, and Goodwin (2004) determined that secondary students who participated in CTE programs increased their academic course taking and achievement.

One of the purposes of high school CTE is to enhance academic achievement and motivate students to learn more (Lynch, 2000). CTE provides students with opportunities to gain critical mathematics, science, and literacy skills in a relevant context, utilizing principles of inquiry-based learning and exploration (Association for Career and Technical Education, 2008). Congressman Buck McKeon from California noted, "Career and technical education is fundamental to our efforts to improve academic achievement at all levels so our nation remains competitive in the face of a rapidly changing global economy" (Association for Career and Technical Education, 2008, p. 5).

Lynch (2000) stated that CTE addresses traditional schools' shortcomings through applied, contextual learning. Success in CTE requires many academic skills (Alfeld et al., 2007), but it has only recently begun to develop measures that can appropriately assess CTE's contribution to academic learning (Hoachlander, 2005). A significant proportion of students who need the most academic support are enrolled in CTE courses, and the overall rigor of CTE has increased noticeably at the high school level in the 21st century (Kazis et al., 2005).

The Role of Career and Technical Education Student Organizations

Career and technical education curricula include a three-faceted instructional strategy. In addition to classroom instruction, it also includes cooperative education, as well as the co-curricular student organization (Compton, 2005). Cooperative education is a method of instruction whereby students enter the workforce and develop a training plan that is orchestrated between the student, the teacher, and the training sponsor, making the workplace a training station that is an extension of the high school classroom. The skills and knowledge developed are based on the CTE curriculum (Rojewski, 2002).

The student organization is also co-curricular, and it provides learning opportunities for learners in a variety of ways based on the course competencies (Camp, Jackson, Buser, & Baldwin, 2000). Learners take part in many educational activities outside of the classroom that may include community service, leadership, competitive events, and career awareness, all reinforcing the learner's curriculum. Students learn to see the applied academic aspects of the CTE curricula, and the CTSOs provide these unique opportunities (Plank et al., 2005). For example, in a quantitative study of CTE students, participants cited student organizations as a primary factor that helped them to learn new skills, prepare for change, and develop positive attitudes (Miller & Meuleners, 2000). CTSOs provide an authentic form of instruction for learners (Alfeld et al., 2007), and they are essential to developing a successful CTE program (Zirkle & Connors, 2003).

Motivation and Engagement

With a greater emphasis on academic course taking, CTSO activities provide a relevant motivational factor for high school students (Plank et al., 2005). CTE offers a variety of learning experiences, and there are many students who prefer the hands-on learning style of CTE. Learning through student organizations keep students motivated, engaged, and in school (Reese, 2010). For example, some students prepare all year for a single competitive event. Simply put, when utilized properly, student organizations help learners to enjoy learning, thereby increasing motivation (Moye, 2010). Stone, Kowske, and Alfeld (2004) attribute the motivation factor to increased enrollments in career and technical education. A survey study of the National FFA Organization participants showed that 83% of students found their student organization

experiences to be exciting, interesting, and challenging as compared to only 32% of non-career and technical education students (Brown, 2003).

Although it is a fundamental assumption that all students can be motivated to learn (Lynch, 2000), enjoyment alone does not necessarily enhance learning. If learning is to be enhanced, then the knowledge and skills must be relevant to the individual's current situation, understanding, and goal (Hmelo-Silver, 2004). Doolittle and Camp (1999) aver that relevancy is likely to increase motivation and that one of the purposes of high school CTE is to "enhance academic achievement and motivation to learn more" (p. 9). CTSO activities positively affect students' academic engagement; the stronger the students' involvement, the better the results (Lekes et al., 2007).

CTSOs engage students in specific career-related learning experiences that equip them to make well-informed decisions about further education, training, and employment opportunities (Meeder, 2006). This type of contextual learning can help keep students engaged and can also provide the real-world quality of career-focused instruction (Kazis et al., 2005). In addition, students who recognize the applied academics aspects of student organizations apply greater effort to his or her academic studies (Gentry, Peters, & Mann, 2007; Plank, 2001). Students who are engaged in educational activities with a clear employment connection are most likely to be motivated and engaged in their own education (Meeder, 2006). In addition, students often join CTSOs because they believe membership experiences and competitions will help to prepare them for employment in their chosen careers (Brown, 2003).

Career and Technical Student Organizations and Achievement

Career and technical student organizations have a long history in the United States and are presumed to contribute to both the academic and life achievements of participants (Camp et al., 2000). Cheek, Arrington, Carter, and Randall (1994) conducted a study of CTSO participants and concluded there was a significant correlation between student organization participation and academic scores. However, little research is available to document the actual impact of co-curricular organizations on students' academic outcomes (Alfeld et al., 2007; Zirkle & Connors, 2003). Citing perceived flaws in the limited existing research activity, Camp et al. (2000) concluded that no studies have been conducted to verify the effects of CTSOs.

Alfeld et al. (2007) found that participation in CTSOs produced positive outcomes for students, particularly for those who participated in competitive events. They determined that competitive events—especially at high levels of competition—provided the greatest results. Kosloski (2008) conducted a discriminant analysis of more than 2,000 high school students and determined the most pronounced determining factor for student success in competitive events was the level of preparation. He concluded that as winning events becomes more important to students, the more likely they are to direct their own learning in preparation for those events. CTSOs also provide an authentic form of assessment not often utilized by core academic areas (Lynch, 2000). Stone and Aliaga (2003) concluded that marketing education participation had no negative effects on academic achievement, but participation in the CTSOs did show a benefit in the development of leadership skills.

CTSOs help youth to link academic and technical work (Brand, 2005). They also provide additional benefits with respect to high school persistence and provide labor market advantage (Plank, 2001). There is a direct relationship between student organizations and high school completion rates (Levesque et al., 2008). CTSOs helpless motivated and more at-risk students to

stay in high school and graduate (Kazis et al., 2005). Wonacott (2003) determined that CTSO participation reduced the likelihood of dropping out of high school, particularly for at-risk learners.

Levels of Engagement in Career and Technical Student Organizations

Students who participate in CTSOs early in their high school careers generally continue to do so during their junior and senior years (Stone et al., 2004). Yet little research has been conducted to determine the impact of multiple years of participation and enhanced benefits predicated on such a persistency. Rarely have studies been conducted that take into account levels or length of participation (Alfeld et al., 2007; Stone et al., 2006; Zirkle & Connors, 2003).

Holland and Andre (1987) found that degree of involvement in extracurricular activity had a significant impact on a variety of developmental variables of high school students, including academic success as measured by grade increases throughout the high school career. Holland and Andre defined degree of involvement by measuring both the amount of time spent in such activities, as well as the number of years of participation. Neumeyer (1997) investigated participation levels and academic achievement of the National FFA Organization members and found that there was a positive relationship between levels of participation and academic achievement. However, the results of the study were not generalizable due to a restricted population and sample size. Alfeld et al. (2007) found that there was a positive association between amount of CTSO participation and academic motivation, academic engagement, grades, career self-efficacy, college aspirations, and employability skills. They conjectured the benefits of CTSOs can be enhanced with increased levels of participation.

Conceptual Framework

The implicit learning theory underlying the curricula and pedagogy of occupational education has been behaviorism, or observable and quantifiable aspects of behavior. In fact, Perkins legislation defines CTE, in part, as competency-based, whereby learners are assessed based on their ability to complete performance objectives without respect to time or even comprehension (Brustein, 2006). With the continued emphasis on the integration of CTE and academics, the emerging theory of constructivism is moving closer to the forefront (Roberts & Ball, 2009). Constructivism is the concept that learners construct their own knowledge from experience rather than such knowledge being transmitted from teacher to learner (Tam, 2000). Each learner's existing knowledge is a basis for learning, and learning is enhanced through problem solving and resulting in the development of new knowledge (Rossing, Miller, Cecil, & Stamper, 2012). Helping student to connect academic knowledge, career readiness, the workplace, and postsecondary education are a foundation of CTE, and the constructivist learning theory may be better suited to today's CTE (Bunch, 2009). Because student organizations provide an authentic instructional strategy, they have become an important tool in altering instruction to motivate and engage learners in all aspects of instruction (Stone et al., 2004). The CTSOs provide an alternative strategy founded in constructivism, allowing learners to create new knowledge through real-world applications of academic principles (Bunch, 2009; Doolittle & Camp, 2000; Stepien & Gallagher, 1993).

Many approaches to instruction fall under the auspices of contextual learning, but this concept most specifically addresses the CTSO as an instructional strategy. While student organizations support learning in general, academically weak students entering high school find

support and success in CTE through contextual learning in CTSOs (Kazis et al., 2005). These co-curricular organizations are often overlooked as an integral part of a program of study that provides meaning, relevance, and experience in deeply contextualized learning of subject matter (Meeder, 2006). This study analyzed whether or not such active learning raises academic achievement as determined by grade point averages and provided empirical evidence for such a association.

Purpose and Research Hypotheses

The purpose of this study was to determine if membership in the marketing education student organization (DECA) impacted the academic success of high school students as indicated by grade point average. To guide this research, the following hypotheses were established:

H_1: Participation in DECA's annual co-curricular activities has a positive effect on the overall GPAs of its membership.

H_2: Multiple years of DECA membership produces a positive influence on the GPAs of its membership.

H_3: A higher level of engagement in DECA's co-curricular annual activities produces a positive effect on the GPAs of its membership.

Significance

Marketing education and its corresponding career and technical education student organization—DECA, An Association of Marketing Students—has always included integrated mathematics, reading, writing, and social competence in its activities as a part of marketing education curricula. The student organization provides its members a unique opportunity to apply those elements of the curricula into leadership and competitive activities. Not only should the application of academics enhance and reinforce the marketing curricula, but it should also enhance and reinforce academic principles. Therefore, this study is important and contributes to the profession by validating the purpose of the student organization as it relates to both the marketing curricula as well as core academics.

Methods and Procedures

In 2008 Edward Davis, Executive Director for DECA, Inc., approached state advisors from each of the 50 states at their annual State Advisor Management Conference in an effort to collect data on DECA's membership for the purpose of analyzing the effect of DECA involvement on academic success. The study was announced in DECA's national online newsletter which was distributed directly to teacher-advisors. Directions for participation were provided to all teachers who wanted to participate in the proposed survey research.

For those students who were encouraged by their advisors to complete the survey, students were asked how many years they had been members of DECA, as well as their current year in school. Next, they were to self-report their grade point average at the conclusion of their freshman, sophomore, and junior years. The freshman year grade point average—prior to involvement with DECA—was used as a baseline against future grade point averages. Research shows that self-reported grade point averages should be used with caution as they may be erroneous or intentionally misreported to avoid a negative stigma associated with low grades (Kuncel, Credé, & Thomas, 2005). However, it is important to note that participants have self-

reported grades anonymously, thereby reducing the likelihood of misreporting for reasons associated with a negative stigma.

The remainder of the survey was adopted from Alfeld et al. (2007) and was an inventory of student degree of participation in CTSOs and extracurricular activities. The data were collected, compiled, and aggregated.

Sample

Marketing education students identified for inclusion in this study were those students who were high school seniors, enrolled in at least one marketing education class, and were also in their third year of DECA membership. This sample consisted of 212 DECA members from Virginia who met all of the inclusion criteria. The total number of students who possessed the characteristics to be included in this study was unknown. However, it was known that the number of members who possessed such traits was exponentially less than the population of DECA membership. While survey information was initially collected from respondents nationally, there was a disproportionate concentration of responses from Virginian members. As a result, the researchers opted to use the Virginian responses only, resulting in a smaller but more concentrated sample.

Research Variables

The research hypotheses were developed in response to the research variables. The dependent variable was grade point average. Each participant was asked to self-report his or her grade point average at the conclusion of his or her freshman and sophomore years and at the midpoint of his or her senior year. By identifying entry, midpoint, and exit grade point averages, the researcher was able to determine academic movement with relationship to the number of years of involvement with the CTSO. All grades were reported on a 4.0 grading scale.

The number of years of membership was predetermined for inclusion in this study. Each year of membership was considered to be an independent variable and would be factored with respect to grade point average movement. The second independent variable was the participants' level of engagement in DECA's annual activities. Alfeld et al.~~,~~ (2007) identified eight organizational activities as possible ways to be involved in the student organization: as a(n) elected officer, voting delegate, committee leader, non-competitive conference participant, workshop participant, competitor in a competitive event, participant in a recognition program, and membership campaign leader. These were used in this study. Participants were also asked if they were involved at the local, district, regional, state, or national level for each category, providing more weight for each as it increased in prominence.

The review of the literature identified several academic outcomes as a result of taking part in extracurricular and other activities outside of the curriculum or the school environment. In an effort to isolate the impact of the CTSO, an additional independent variable was examined. It included an array of extracurricular and volunteering activities. Listed were athletics (club or intramural), boy scouts or girl scouts, Boys' or Girls' Clubs, church youth group, 4-H Club, athletics (school team), band/choir, class officer, foreign language club, math/science club, military, and drama. Participants were also asked to identify any additional outside activities in which they participated.

Instrumentation and Data Collection

Part of the instrument used for this study was adopted from the *Degree of Participation in CTSO* and *Extracurricular Activities* instruments utilized by Alfeld et al. (2007). The Alfeld instruments were piloted in 2004, revised, re-piloted, and met with acceptable reliability (n = 2485, α > 00.80). No alterations were made to the existing instrument with the exception of omitting the elements not germane to this study.

In order to participate, chapter advisors were first required to register for the study. Once registered, advisors were given a unique six digit chapter code. Chapter advisors were subsequently instructed to provide this chapter code to each suitable participant and to add a three digit number at the end for each participating DECA member (001, 002, 003, etc.). The code then allowed the researcher to recognize any duplicate entries, and it also allowed the researcher to track the origin of the participant while still maintaining anonymity for individual participants. The unique identifying code was a requirement for completion of the research inventory.

Analysis

The researcher reported descriptive statistics with respect to participant demographics, degree of participation, years of membership, grade point averages, and grade point average growth or reduction. The researcher then computed a series of ANOVAs, comparing the mean grade point averages prior to DECA membership, following one year of DECA membership, and after two years of DECA membership.

Several variables were computed. Levels of engagement in DECA's annual activities were weighted based on whether or not the activity took place on the local, regional, state, or national level, with the most weight being assigned to national activities. Respondents were given no value for any responses whereby they were not active in a given activity.

Several new variables were computed with respect to grade point average, engagement in DECA's annual activities, and extracurricular involvement. A variable was computed to determine the difference between each respondent's entrance grade point average as compared to their exit grade point average. The entrance grade point average was subtracted from the exit grade point average and the difference was calculated.

The second series of variables pertained to each participant's level of engagement in DECA's annual activities. The first variable created was to determine each participant's first year level of engagement in DECA's annual activities. The variable was computed by summing the values of each participant's responses to their first year engagement in DECA's annual activities with progressive weighting on local, regional, state, and national activities. A similar variable was created for engagement levels during their senior year, summing levels of engagement on the same scale. A third variable was created, identifying total engagement by summing all of the involvement scores. Finally, a fourth engagement variable was created to categorize each participant's level of engagement based on the total involvement scores. A frequency report was conducted and the midpoint percentile cut score was determined.

The last series of variables created surrounded extracurricular activity. Participants were asked to identify extracurricular activity that held progressive weighting based on their levels of participation. Participants were able to write in any extracurricular activities that were not included on the original form. Values for each were summed, providing the researcher with a

total extracurricular involvement score. Once this score had been created, a frequency report was conducted to determine the value of the fiftieth percentile cut score.

A one-way repeated-measures ANOVA was conducted with the factor being the year of membership and the dependent variable being grade point average. Determinations were made regarding whether there was a significant time effect with respect to the number of years of participation in DECA in relation to grade point average. Follow-up polynomial contrasts were also conducted to determine if there was a significant linear effect over time.

A two-way analysis of variance was conducted to evaluate the effects of levels of engagement in DECA's annual activities and extracurricular activities on grade point average growth or reduction throughout each participant's membership period in DECA. The means and standard deviations for grade point average improvement as a function of the two factors were computed, as well as the main effect for levels of participation in DECA. A Levene's test was conducted to determine the homogeneity of variance.

Findings and Conclusions

Response Rate

There were 363 valid and suitable responses to the survey (n = 363) originating from eleven states across the United States, not inclusive of those responses that were deemed not possessing the traits to be included in this study. Of the 363 responses meeting the selection criteria for the study, 230 were from students who attended a Virginia high school. Because there were a disproportionate number who participated in the study, the researcher decided to use only those responses that originated from a Virginian student. The purpose was to knowingly utilize a smaller yet more concentrated sample. Of the 230 Virginian responses, 18 were removed due to incomplete data, leaving 212 cases for analysis after data screening (n = 212). See Table 1.

Table 1
Demographic Information for Inventory Respondents

		Virginia Demographic Information			
		White	Black	Other	Total
Gender	Male	60	16	14	90
	Female	93	10	19	122
Total		153	26	33	212

Hypothesis 1: Participation in DECA's annual co-curricular activities has a positive effect on the overall GPAs of its membership.

To address the first research hypothesis, descriptive statistics and a one-way repeated measures analysis of variance were computed. The means and standard deviations for grade point averages were computed including results for entry, midpoint, and exit grade point averages. Grade point average increases were reported in 139 cases, while only 74 cases showed no gain or a decrease in grade point average. See Table 2.

Table 2
Means and Standard Deviations of Grade Point Averages

	M	SD
Entry GPA	3.19	0.67
Mid-point GPA	3.24	0.67
Exit GPA	3.32	0.66

The one-way repeated measures analysis of variance was conducted with the factor being the number of years of membership in DECA and the dependent variable being grade point average. The results for the analysis of variance indicated a significant increase based on grade point average increases between the entry and exit measurements, Wilks's $\Delta = .88$, $F(2, 209) = 14.14$, $p < .001$, multivariate $\eta^2 = .12$.

The findings indicate a significant increase in grade point averages during each year of DECA membership. This was particularly apparent given the fact that entry grade point averages for participants were already elevated at 3.19 on a 4.0 scale. This supported the assertion that many of the students who opt to participate in DECA "are good students to begin with" (Stone et al., 2006, p. 30).

Hypothesis 2: Multiple years of DECA membership produces a positive influence on the GPAs of its membership.

To address the second research hypothesis, the results of the same computations were analyzed. An examination of the results showed that 106 of the respondents had an increase in grade point average between the pre-membership year and the end of the first year, 50 respondents showed a decrease, and the remaining 56 remained constant with no movement. Between the end of the first and second years of membership, 126 respondents showed an increase in grade point average, 49 showed a decrease, and the remaining 37 remained constant. A graphical representation of these movements can be seen in Figure 1.

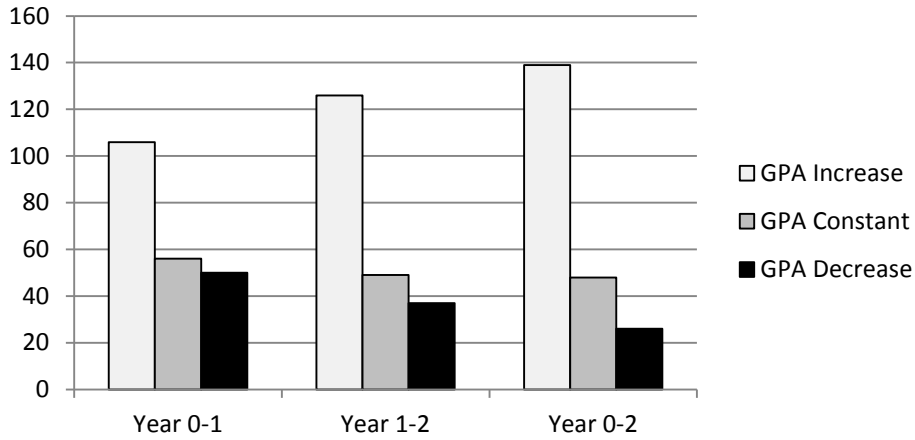

Figure 1. A comparison of the number of grade point average increases between years of DECA Membership.

The results for the analysis of variance indicated, as noted above, show a significant increase based on grade point average increases between not only the entry and exit measurements, but also between the first and second years of membership, Wilks's $\Delta = .88$, $F(2, 209) = 14.14$, $p < .001$, multivariate $\eta^2 = .12$.

Follow-up polynomial contrasts indicated a significant linear effect with mean grade point averages increasing with a second year of membership, $F(1, 210) = 26.00$, $p < .001$, partial $\eta^2 = .962$. Higher order polynomial contrasts were not significant.

Pairwise comparisons between years of participation indicated a significant increase in grade point average with each year of membership. The results indicated the exit grade point averages ($M = 3.32$, $SD = .66$) were significantly greater than the mean for entrance grade point averages ($M = 3.19$, $SD = .67$), $MD(0.13)$, $p < .001$. The 95% confidence interval for the mean difference between the two ratings was .08 to .18. These results indicated the exit grade point averages ($M = 3.32$, $SD = .66$) were also significantly greater than the mean for midpoint grade point averages ($M = 3.24$, $SD = .67$), $MD(0.09)$, $p < .001$. The 95% confidence interval for the mean difference between the two ratings was .05 to .12. Finally, the results indicated the midpoint grade point averages ($M = 3.24$, $SD = .67$), $p < .01$ were significantly greater than the mean for entrance grade point averages ($M = 3.19$, $SD = .67$), $MD(0.45)$, $p < .001$. The 95% confidence interval for the mean difference between the two ratings was .11 to .78. The results of these pairwise comparisons can be seen in Table 3 and Figure 2.

Table 3
Comparisons of Grade Point Averages and Year of Membership

(I) Year of Involvement	(J) Year of Involvement	Mean Difference (I-J)	Std. Error	Sig.[a]
0	1	-.045*	.017	.010
	2	-.133*	.026	.000
1	0	.045*	.017	.010
	2	-.088*	.018	.000
2	0	.133*	.026	.000
	1	.088*	.018	.000

Based on estimated marginal means

*The mean difference is significant at the .05 level.

a. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no

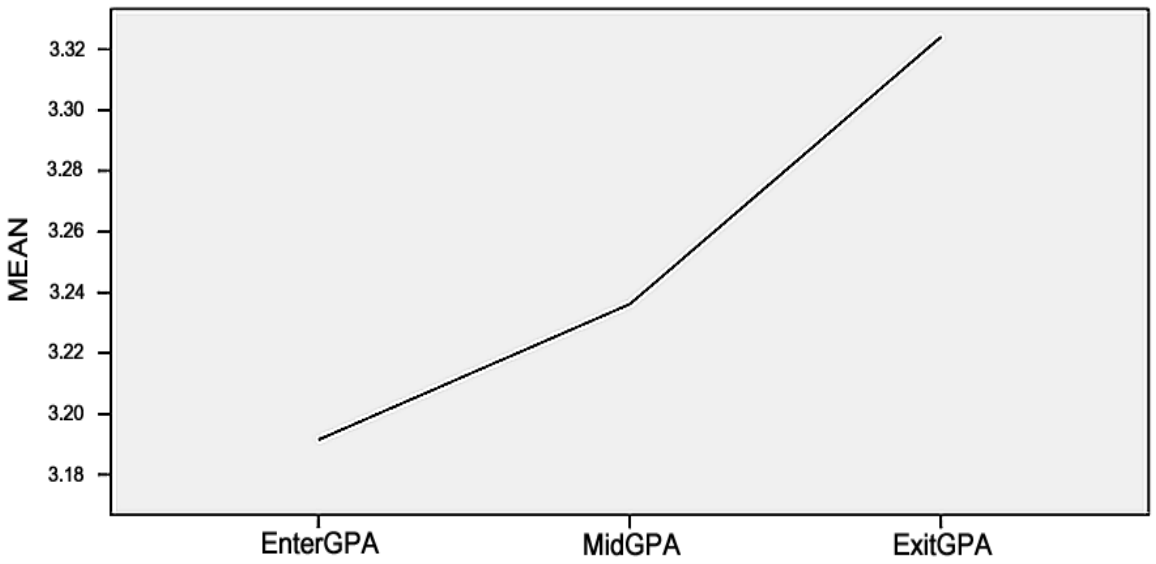

Figure 2. Entry, midpoint, and exit grade point averages based on year of membership

The findings of this study indicated that grade point average differences between the end of the first and second years showed significant increases at an even greater level than did the first year. This supports the assertion of Alfeld et al. (2007) that the benefits of CTSOs are enhanced by multiple years of membership.

Hypothesis 3: A higher level of engagement in DECA's co-curricular annual activities produces a positive effect on the GPAs of its membership.

To examine these effects, a one-way analysis of variance was computed with the degree of engagement being the independent factor and grade point average being the dependent variable. Degree of involvement in extracurricular and outside activities was also integrated into the analysis of variance as a confounding factor. The analysis of variance indicated no significant interaction between levels of engagement in DECA's annual activities and extracurricular activities, $F(1, 203) = 0.13$, $p = .909$, partial $\eta^2 < .01$ or with the main effect for extracurricular activities, $F(1, 203) = .77$, $p = .381$, partial $\eta^2 < .01$. However, there was a significant main effect for levels of engagement in DECA's annual activities, $F(1, 203) = 5.71$, $p = .018$, partial $\eta^2 = .027$. As indicated by Levene's test, the homogeneity of variance is acceptable, $F(3, 208) = 1.43$, $p = .23$. The involvement main effect indicated that participants who had higher levels of engagement in DECA's annual activities tended to have greater improvements in grade point averages than those who had lower levels of involvement.

Follow-up tests were computed to establish pairwise differences between the means using Tukey HSD. The results indicated that the mean score for the low involvement group (M = 3.26, SD =0.79) was significantly different than the high involvement group (M = 3.47, SD = 0.65). Results also indicated that there was no significant difference between the means for the low involvement and the moderately active group (M = 3.31, SD = 0.70) nor was there a significant difference between the moderately active group and those with high levels of. As a result, it can be concluded that DECA members who are deeply immersed in DECA's annual activities for an extended period of time reap greater academic gains than those members who participate more passively.

Discussion

One explanation for the positive effect of DECA membership on high school grade point average may be the very nature of the organizational activities. DECA's annual activities consist largely of leadership opportunities and competitive events. Such learning activities are intentionally career-based and contextual in nature. Research provides evidence that contextual learning does enhance learning (Lekes et al., 2007; Miller, 2002; Nickerson & Zenger, 2004~~;~~). Given that the CTSO activities are integrated with classroom instruction and cooperative education, the opportunity for learning should be enhanced for each of its members. Finally, assuming that DECA's annual activities integrate academics (Bishop & Mane, 2004; Brustein, 2006; Meeder, 2006; Stone et al., 2004), then those academic principles are also supported by each member's academic classroom learning. Organizational activities would then be supported on multiple levels.

Multiple years of membership did amplify academic gains. Ironically, follow-up tests indicated, while not significant, the number of events and activities that members participated in actually decreased slightly during their second year of membership as compared to their first year. However, this quantitative number is in no way indicative of the degree of engagement for each individual event or activity. It is believed many members engage in their first year of membership in a tentative or explorative fashion. It is possible members are not fully aware of the opportunities provided them through membership until having been exposed during their initial year. It is also possible that while they may or may not be aware of the opportunities provided, they are more motivated by those opportunities once they have witnessed their peers reaping rewards from such events and activities.

Finally, if the contextual and problem-solving activities do enhance learning (Lekes et al., 2007; Miller, 2002; Nickerson & Zenger, 2004), it would be logical to assume that there is a prolonged and cumulative effect, much like taking multiple years of mathematics or a foreign language. Multiple years of membership may provide building blocks for learning, with each year of membership reinforcing and adding onto the previous year.

One plausible explanation for the positive impact of the degree of engagement in DECA's annual activities on high school grade point average is that members who take part in more and higher levels of DECA's annual activities increase the amount of individual contextual and problem-based learning that occurs. It would stand to reason both higher quantities and magnitudes of such learning would also amplify the gains. Members who become more engaged with these activities would experience greater levels of quantity and magnitude.

Another explanation may be students are able to comprehend the connections between DECA's annual activities and how those activities parallel academics and employment. Employment oriented contextual learning can keep students engaged (Kazis et al., 2005), and those who can most see the connection between academic activities and employment are the most likely to be engaged in their own education (Meeder, 2006). In addition, those who can make an employment connection to organizational activities are the most likely to take control of their own education (Brown, 2003) and apply greater effort (Gentry et al., 2007).

A final explanation may be quite simplistic. While enjoyment alone does not necessarily enhance learning (Lynch, 2000), enjoyment of a true educational activity can keep learners more engaged in that learning activity (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005). Therefore, if DECA members find participation in DECA's annual activities enjoyable, they are more likely to immerse themselves in those activities. In addition, when students can connect a specific goal to an activity, they tend to immerse themselves deeper into that activity (Hmelo-Silver, 2004).

DECA's annual activities offer its members many opportunities for not only intrinsic rewards, but also provides socialization, prestige, and travel opportunities that members might not otherwise be afforded. As a result, members may seek out the enjoyment or rewards offered through DECA's leadership and competitive events opportunities.

This study did indicate that extracurricular and other outside activities did not show significant increases in academic outcomes for this sample. This is contrary to what is written in much of the literature with respect to the benefits of extracurricular activities (Marsh & Kleitman, 2002). One possible explanation is that because DECA provides so many different leadership and competitive events opportunities, those students who feel passionately about their role in DECA desire to seek out additional DECA opportunities rather than seeking new extracurricular activities. Another explanation may be that while members do not necessarily seek out additional events and activities, they may intensify their engagement levels in those events and activities. Many of these events and activities may occur for an entire school year, such as competitive events preparation, and the increased amount of time and effort spent on such activities may inhibit more passionate members from delving deeply into other extracurricular or outside activities.

Further Research

Because each CTSO has its own strengths and weaknesses (Camp, Jackson, Buser, & Baldwin, 2000), results from this study may or may not be generalizable to other CTSOs. As a result, similar research should be conducted for other CTSOs. Doing so would provide a valuable tool for pinpointing strengths and weaknesses in CTSOs as a whole, as well for each individual CTSO. Stakeholders in these organizations have clamored for more empirical evidence of success for years. There are benefits to providing research results collectively and independently. Once results are analyzed for each CTSO, those same results can also be utilized as a starting point for evaluation and improvement.

While this study did examine levels of engagement in DECA's annual activities and its corresponding effect on grade point average, it counted activities, providing more weight to those activities that presumably require more effort on the part of the member. A limitation of this study is that, while quantifying levels of engagement, the continuum had a ceiling and floor effect, thereby limiting the analysis of gains. While the study could not effectively identify a "supermember" from a highly engaged member, or a totally disengaged member from a very low level of engagement, it did aid in quantifying and categorizing members by their degree of engagement. However, this is not the only way that one could compare levels of engagement. While some members may be active in multiple levels of events and activities, others may limit the number of activities and events in which they participate, but this may not necessarily indicate a lower level of engagement.

Some DECA members become intensely immersed in only one or two events or activities and spend inordinate amounts of time with them. For example, some DECA members prepare all year for a single competitive event in the hopes that they will achieve success in that event. As a result, research should be conducted to determine the amount of time spent on DECA activities and events as opposed to only the quantity and levels of those activities and events. While multiple activities and events are indicative of the amount of time engaged in activities, another measure would be to directly measure the time spent in those events, thereby eliminating the ceiling and floor effect.

Summary

DECA provides unique, contextual, and experiential co-curricular activities for its membership. Third year DECA members across the state of Virginia identified the breadth and depth of the activities in which they were involved. Analysis of the data showed that there is a positive effect of DECA membership on grade point average in high school. Academic gains increased not only with time, but a high level of engagement in those activities also increased academic gains, presumably, in part, due to the contextual nature of those activities. While these results may or may not be generalizable to other CTSOs, stakeholders can feel confident that student engagement in DECA enhances academic performance.

References

Alfeld, C., Stone, J., Aragon, S. R., Hansen, D. S., Zirkle, C., Connors, J., & Woo, H. (2007). *Looking inside the black box: The value added by CTSOs to students' high school experience.* St. Paul, MN: National Research Center for Career and Technical Education, University of Minnesota.

Association for Career and Technical Education (ACTE). (2008). *Career and technical education's role in American competitiveness.* Alexandria, VA: Author.

Barab, S., Thomas, M., Dodge, T., Carteaux, R., & Tuzun, H. (2005). Making learning fun: Quest Atlantis, a game without guns. *Educational Technology Research and Development, 53*(1), 86-107.

Berns, R. G., (1996). *DECA: A continuing tradition of excellence*. Reston, VA: DECA, Inc.

Bishop, J., & Mane, F. (2004). The impacts of career-technical education on high school labor market success. *Economics of Education Review, 23*, 381-402.

Brand, B. (2005). Rigor and relevance: A new vision for career and technical education. *American Youth Policy Forum.* Washington, DC. Retrieved from http://www.aypf.org/publications/aypf_rigor_0004v.3.pdf.

Brown, B. (2003). *The benefits of career and technical education: Trends and issues alert. ERIC Digest*, ED 481326. Retrieved from http://eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/29/d7/0c.pdf.

Brustein, M. (2006). *The Perkins Act 2006*. Alexandria, VA: Association for Career and Technical Education (ACTE).

Bunch, J. M. (2009). A constructivist approach to teaching web development in post-secondary vocational settings. *Journal of Information Technology Education, 8*, 257-271.

Camp, W., Jackson, R., Buser, B., & Baldwin, E. (2000). *Vocational student organizations and student achievement*. Berkeley, CA: National Center for Research in Vocational Education, University of California, Berkeley.

Cheek, J. G., Arrington, L. R., Carter, S., & Randall, R. S. (1994). Relationships of supervised agricultural experience program participation and student achievement in agricultural education. *Journal of Agricultural Education, 35*(2), 1-5.

Compton, K. (2005). *An examination of the factors that influence the decision to participate in youth leadership development opportunities in rural high schools in three southern states.* Unpublished master's thesis, Texas Tech University, Texas. Retrieved from Texas Digital Library at http://repositories.tdl.org/tdl/ handle/2346/1144.

DECA, Inc. (2010). *Membership*. Retrieved from http://www.deca.org/ membership/ highschool.html.

DECA, Inc. (2013). *Membership*. Retrieved from http://www.deca.org/membership/.

Doolittle, P. E., & Camp, W. G. (1999). Constructivism: The Career and Technical Education Perspective. *Journal of Vocational and Technical Education, 16*(1), 23-46.

Gentry, M., Peters, S., & Mann, R. (2007). Differences between general and talented students' perceptions of their career and technical education experiences compared to their traditional high school experiences. *Journal of Advanced Academics, 18*(3), 286-292.

Gordon, H. (2008). *The history and growth of vocational education in America* (3rd ed.). Prospect Heights, IL: Waveland Press.

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review, 16*(3), 235-266.

Hoachlander, G. (2005). Does vocational education have a role to play in high school reform? *Education Week, 24*(33), 38-48.

Holland, A., & Andre, T. (1987). Participation in extracurricular activities: What is known, what needs to be known? *Review of Educational Research, 57*(4), 437-436.

Kazis, R., Bottoms, G., Brand, B., Hughes, K. L., Medrich, E. A., Oliver, K. M., …Weiner, R. (2005). Remaking career and technical education for the 21st century: What role for high school programs? *ERIC Digest*, ED 497815. Retrieved from http://www.eric.ed.gov/ ERICDocs/data/ericdocs2sql/content_ storage_01/0000019b/80/30/b1/d6.pdf.

Kosloski. (2008). A study to determine what factors contribute to student success in DECA's competitive events. *Iota Lambda Sigma Journal for Workforce Education, 1,* 19-24.

Kuncel, N. R., Credé, M., & Thomas, L. L. (2005). The validity of self-reported grade point averages, class ranks, and test scores: A meta-analysis and review of the literature. *Review of Educational Research, 75*(1), 63-82.

Lekes, N., Bragg, D., Loeb, J. W., Oleksiw, C. A., Marzalek, J., Brooks-Ralaviere, M., …Hood, L. (2007). *Career and technical education pathway programs, academic performance, and the transition to college and career.* St. Paul, MN: National Research Center for Career and Technical Education, University of Minnesota.

Levesque, K., Laird, J., Hensley, E., Choy, S.P., Cataldi, E.F., & Hudson, L. (2008). *Career and technical education in the United States: 1990 to 2005* (NCES 2008-035). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.

Lynch, R. L. (2000). *New directions for high school career and technical education in the 21st century*. Columbus, OH: ERIC and the Center on Education and Training for Employment. (ERIC Document Reproduction Service No. ED-99-CO-0013.)

Marsh, H. W., & Kleitman, S. (2002). Extracurricular school activities: The good, the bad, and the nonlinear. *Harvard Educational Review, 72*(4), 464-514.

Meeder, H. (2006). *Reinventing the American high school for the 21st century.* Alexandria, VA: Association for Career and Technical Education (ACTE). Retrieved from http://www.acteonline.org/uploadedFiles/Issues_ and_ Advocacy/files/ACTEHSReform_ Full.pdf.

Miller, V. R. (2002). *The role of career and technical education in high school*. Washington, DC: Office of Vocational Education.

Miller, K., & Meuleners, M. (2000). Straight from the source. *Techniques: Connecting Education and Careers, 75*(1), 24-25.

Moye, J. (2010). Making your classes come alive. *Techniques, 85*(4), 8-9.

Neumeyer, C. C. (1997). *A comparison of extracurricular participation and academic achievement of FFA members.* Unpublished master's thesis, New Mexico State University, Las Cruces. Retrieved from http://lib.nmsu.edu/sspi/thesis/neumeyer

Nickerson, J. A. & Zenger, T. R. (2004). A knowledge-based theory of the firm: The problem-solving perspective. *Organization Science, 15*(6), 617-632.

Park, T. (2010). Reading frameworks in CTE: Pilot study findings. *Techniques, 85*(5), 42-44.

Plank, S. B. (2001). A question of balance: CTE, academic courses, high school persistence, and student achievement. *Journal of Vocational Education Research, 26*(3), 279–327.

Plank, S., DeLuca, S., & Estacion, A. (2005). *Dropping out of high school and the place of career and technical education: A survival analysis of surviving high school.* St. Paul, MN: National Research Center for Career and Technical Education, University of Minnesota.

Roberts, T., & Ball, A. (2009). Secondary agricultural science as content for context for teaching. *Journal of Agricultural Education, 50*(1), 81-91.

Rojewski, J. W. (2002). Preparing the workforce to tomorrow: A conceptual framework for career and technical education. *Journal of Vocational Education Research, 27*(1). Retrieved from http://scholar.lib.vt.edu/ ejournals/JVER/v27n1/rojewski.html

Rossing, J., Miller, W., Cecil, A., & Stamper, S. (2012). iLearning: The future of higher education? Student perceptions on learning with mobile tablets. *Journal of the Scholarship of Teaching and Learning, 12*(2), 1-26.

Silverberg, M., Warner, E., Fong, M., & Goodwin, D. (2004). *National Assessment of Vocational Education: Final Report to Congress*. Washington, D. C.: United States Department of Education, Office of the Under Secretary, Policy and Program Studies Service.

Stone, J., Alfeld, C., Pearson, D., Lewis, M., & Jensen, S. (2006). *Building academic skills in context: Testing the value of enhanced math learning in CTE.* St. Paul, MN: National Research Center for Career and Technical Education, University of Minnesota.

Stone, J., & Aliaga, O. (2003). *Career and technical education, career pathways, and work-based learning.* St. Paul, MN: National Research Center for Career and Technical Education, University of Minnesota.

Stone, J. R., Kowske, B., & Alfeld, C. A. (2004). Career and technical education in the late 1990's: A descriptive study. *Journal of Vocational Education Research, 29*(3). Retrieved from http://scholar.lib.vt.edu/ejournals/JVER/ v29n3/ stone.html.

Symonds, W. Schwartz, R., & Ferguson, R. (2011). *Pathways to prosperity: Meeting the challenge of preparing young Americans for the 21st century.* (Report issued by the Pathways to Prosperity Project). Cambridge, MA: Harvard Graduate School of Education.

Tam, M. (2000). Constructivism, instructional design, and technology: Implications for transforming distance learning. *Educational Technology & Society, 3*(2), 50-60.

United States Department of Education. (June 2008). *Career and technical student organizations: A reference guide* (*3rd ed*.) Washington, DC: Office of Vocational and Adult Education.

Wonacott, M. (2003). *History and evolution of vocational and career-technical education. A compilation*. Columbus, OH: ERIC Clearinghouse on Adult, Career, and Vocational Education. (ERIC Document Reproduction Service No. ED482359.)

Zirkle, C., & Connors, J. J. (2003). The contribution of career and technical student organizations (CTSO) to the development and assessment of workplace skills and knowledge: A literature review. *Workforce Education Forum, 30*(2), 15-26.

The Authors

Michael F. Kosloski, Jr., Ph.D. is an Assistant Professor of STEM Education and Professional Studies, Darden College of Education, at Old Dominion University in Norfolk, VA. He can be contacted by Email at mkoslosk@odu.edu

John M. Ritz, Ed.D. is a Professor of STEM Education and Professional Studies, Darden College of Education, at Old Dominion University in Norfolk, VA. He can be contacted by Email at jritz@odu.edu