Programs of Study as a State Policy Mandate: A Longitudinal Study of the South Carolina Personal Pathways to Success Initiative

April 2013

Final Technical Report: Major Findings and Implications

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National Research Center for Career and Technical Education

Technical Report

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A Longitudinal Study of the South Carolina Personal Pathways to Success Initiative

Final Technical Report:
Major Findings and Implications

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List of Acronyms Used in This Report

AED	Academy for Educational Development
AP	Advanced Placement
ASCA	American School Counseling Association
CAP	Course Alignment Project
CATE	Career and Technology Education
CCTI	College and Career Transitions Initiative
CDF	Career Development Facilitator
CHE	Commission on Higher Education
CS	Career Specialist
CIP	Classification of Instructional Programs
CTE	Career and Technical Education
EEDA	Education and Economic Development Act
EEDACC	EEDA Coordinating Council
EOC	Education Oversight Committee (South Carolina)
eIGP	Electronic Individual Graduation Plan
GC	Guidance Counselor
GCDF	Global Career Development Facilitator
HSAP	High School Assessment Program (South Carolina)
HSTW	High Schools That Work
IB	International Baccalaureate
ICP	Individual Career Plan
IEP	Individualized Education Program
IGP	Individual Graduation Plan
JAG-SC	Jobs for America's Graduates – South Carolina
LHSAP	Longitudinal HSAP (South Carolina high school exit exam) variable
LOI	EEDA Level of Implementation
NASDCTEc	National Association of State Directors of Career and Technical Education Consortium
NCD	National Career Development, from National Career Development Association
NCES	National Center for Education Statistics
NCLB	No Child Left Behind Act of 2001
NDPC	National Dropout Prevention Center

NRCCTE	National Research Center for Career and Technical Education
OVAE	Office of Vocational and Adult Education
PACT	Palmetto Achievement Challenge Test (South Carolina)
PLTW	Project Lead The Way
POS	Programs of Study
POS1	Programs of Study, Concept 1, for analysis of student-level data from the statewide longitudinal data system (SLDS)
POS2	Programs of Study, Concept 2, for analysis of numbers and participation in state-defined CTE programs
POS3	Programs of Study, Concept 3, for analysis of POS Student Engagement Survey, CTE and non-CTE student groupings for student-level analyses
POS4	Programs of Study, Concept 4, study-defined, Perkins IV Program of Study
POS5	Programs of Study, Concept 5, study-defined, District Perkins IV Program of Study
POS6	Programs of Study, Concept 6, sample school identified programs with the strongest secondary-postsecondary linkages
POV	Research Variable: Level of Community Poverty
PSLOI	Preliminary Selection Level of Implementation
REC	Regional Education Center
RECAP	Regional Education Center Advisory Panel
SC CAP	South Carolina Course Alignment Project
SCOIS	South Carolina Occupational Information System
SC TRAC	South Carolina Transfer and Articulation Center
SDE	South Carolina Department of Education
SEI	Socioeconomic Indicator Flag, SLDS
SLDS	Statewide Longitudinal Data System
SLICE	South Carolina Longitudinal Information Center for Education
SLOI	Site Selection Level of [EEDA] Implementation
STEM	Science, Technology, Engineering and Mathematics
TAP	Technical Advance Placement
TRAC	Transfer and Articulation Center
WBL	Work-based Learning
WIA	Workforce Investment Areas

Executive Summary

This is the technical report of a five-year study of South Carolina's Personal Pathways to Success Initiative, which was authorized by the state's Education and Economic Development Act (EEDA) in 2005. The Personal Pathways initiative is a K-16, career-focused school reform model intended to improve student achievement and preparedness for postsecondary education and high-skill, high-wage, and high-demand jobs. EEDA was designed to achieve these results through a focus on career awareness and exploration at all school levels and through the creation of locally relevant career pathways and programs of study (POS). The goals of EEDA are closely aligned with those of the Carl D. Perkins Career and Technical Education Act of 2006, otherwise known as Perkins IV, which allowed us to conduct an examination of the effects of the Perkins Act in the context of a highly supportive state policy. The study's goals were to measure specific impacts related to the state policy and the development of POS; the study examined the policy in its early implementation years and in the context of high school.

Perkins IV is the fourth iteration of earlier federal Perkins laws focused on improving the quality of career and technical education (CTE) in the United States. Perkins IV includes, among other things, new requirements for POS that link academic and technical content across secondary and postsecondary education.

Although EEDA preceded Perkins IV, it required South Carolina schools to implement reforms that incorporate nearly all of the core and supporting components considered necessary for the successful development of Perkins IV-funded POS, as well as additional elements that could support and sustain the implementation of POS. For example, EEDA components include the organization of high school curricula around career clusters, an enhanced role for school counselors, and extra assistance for high-risk students. Further, the law mandates evidence-based high school reform, regional education centers charged with facilitating business-education partnerships, and greater articulation between secondary and postsecondary education.

Study Design

This five-year study investigated the extent to which a statewide reform mandate like the EEDA facilitates the creation of career pathways and POS (as defined in Perkins IV) in various high school contexts and whether these POS lead to improved student high school and postgraduation preparation and planning. This study also explored the influence of the availability of school and community resources and future employment opportunities—whether substantial or limited—on the development of POS and the outcomes of students enrolled in them.

The study employed a quasi-experimental design with a mixed-methods, triangulated approach (Tashakkori & Teddlie, 2002) and followed two student cohorts from a sample of eight high schools from economically and culturally diverse regions of South Carolina.

The school sample was carefully drawn through a four-stage sampling process and selected to vary on critical study factors: (a) employment opportunities and industrial mix, (b) local school and community economic conditions, and (c) initial levels of EEDA implementation. Data were collected from two cohorts of students selected because of their varying levels of exposure to the

reforms mandated by EEDA. These two cohorts included those who graduated in 2009 (who had little to no exposure to EEDA) and those who graduated in 2011 (with exposure to EEDA from the eighth to twelfth grades).

The study was structured around the following three research questions:

1. To what extent does South Carolina's EEDA facilitate the development of POS?
2. What impact does the level of local economic resources have on the implementation of EEDA and the development and implementation of POS?
3. What impact does the implementation of EEDA and the POS required by Perkins IV have on student high school outcomes and postgraduation preparation and plans?

Data Collection

To create a broad understanding of EEDA's influence on schools, teachers, students, and the creation of POS, a variety of quantitative and qualitative data were collected and analyzed. Quantitative data included student outcome and survey data from the Classes of 2009 and 2011 and survey data from guidance personnel. From the South Carolina Department of Education (SDE) statewide longitudinal data system (SLDS), we collected student and school-level longitudinal demographic, attendance, and discipline data; eighth-grade standardized test scores; course histories; and Individual Graduation Plan (IGP) data (including declaration of majors, intentions to complete majors, and postsecondary plans). From the SDE Office of Career and Technical Education (SDE CATE), we collected school-level data on state-recognized CTE programs and enrollment in these programs over the study period.

The student survey was developed in collaboration with researchers from the NRCCTE's other two longitudinal POS studies. This *Student Engagement/POS Experiences Survey* covered a range of topics, including questions regarding career clusters, career planning and development, the development of IGPs, majors, coursework, school engagement, and demographic characteristics. The Class of 2009 was surveyed once, just prior to high school graduation, and the Class of 2011 was surveyed twice, once following tenth grade and again just prior to graduation.

Guidance personnel were surveyed about their involvement in career-focused education and the development of student IGPs and about changes in their assigned duties since the implementation of the main elements of EEDA related to high school guidance responsibilities. The duties included those related to curriculum development and counseling and classroom guidance for students in the areas of career, academic, and social development; consulting with other school staff or parents; coordination activities related to special events and professional development; and "inappropriate" duties (based on EEDA guidelines), such as administering standardized tests and developing the master class schedule. Surveys were administered to guidance personnel in the Fall of 2009 and the Spring of 2012.

Qualitative data included perspectives gleaned from interviews and focus groups conducted with school principals, counselors, teachers, and students, as well as community college administrators. Content from course catalogs and other career-related materials was also

analyzed. Three site visits to each school were conducted during the study period. The first was an initial visit to potential sample schools, in Spring 2009, focused on the primary goal of understanding the level of ongoing EEDA activities at the school, and included interviews with school principals and guidance directors and focus groups with assistant principals, guidance personnel, and diverse groups of ninth- and tenth-grade teachers. The second round of site visits, in Fall 2009, were geared toward collecting data on the development and implementation of POS and associations between POS and the state policy. During these visits, individual and focus group interviews were conducted with guidance personnel, curriculum coordinators, CTE coordinators and faculty, partner career center staff (where relevant), and partner college administrators and faculty. In-depth, follow-up phone interviews were conducted with school counselors in the Spring of 2010 to further explore policy and POS implementation and the impact of these on their duties. A third site visit was conducted at each school in Spring 2011 to conduct focus group interviews with the Class of 2011 as seniors. Additional phone interviews were conducted with school counselors in Spring 2012.

In order to analyze these varied data sources and address our research questions, we constructed a number of contextual and analysis variables. We developed a scheme to score the level of policy implementation at each school that included the collection and analysis of relevant quantitative and qualitative data on the six most salient facets of EEDA related to high schools. A community poverty four-factor index for school-level analysis was developed so that we could score each school based upon its level of community resources. Varied measures of POS were also constructed, based on quantitative (POS1, POS2, and POS3) data or a mixture of quantitative and qualitative data (POS4, POS5, and POS6).

In the process of developing the POS variables, we encountered a major challenge: At the time of our site visit interviews, many schools and districts were in the early stages of developing clusters and career majors, leading to little consistency in majors and POS that would allow us to make comparisons across schools. As a result, data from various sources could not be linked on common program names and definitions. Also, EEDA encompasses more than just CTE courses and programs and requires the development of POS across the curriculum in all subject areas. We therefore needed to devise a method to select only those majors/programs that were strictly CTE because that was the focus of our study. In addition, once we identified majors/programs to review, we found that the elements of Perkins IV POS—as outlined in the Perkins law and supplementary implementation materials developed by the U.S. Department of Education, Office of Vocational and Adult Education (OVAE)—were not sufficiently well-defined to allow for easy translation into direct measures for each element. This required us to operationalize the four core elements of Perkins IV-funded POS for our analyses.

Findings Across Sample Schools

Overall, we found that EEDA was having some positive impact on schools, school administrators, guidance personnel, teachers, and students. Career-focused activities had increased at all schools and guidance personnel were playing major roles in implementing policy. But the evidence on associations between the policy and POS development was mixed and/or contradictory. However, there was evidence that the policy was helping to facilitate some of the foundational elements for POS development.

One surprising finding was that at schools with more challenging economic situations, POS were more likely to be embraced and more fully developed than at other schools in more prosperous communities. This appeared to be related to a perception at these schools that given the poor economic circumstances in their communities, their students could really benefit from clearer avenues toward careers and employment.

Similar mixed and/or contradictory results were found on associations between policy implementation and POS development and student outcomes. Students were found to be benefitting from these policies and POS, but the types of benefits and the degree of benefit varied across schools and subgroups of students.

From our observations over the five-year period and analyses of these varied data sources, 12 overarching themes emerged that summarize the major trends found across schools during the study period. These themes are briefly described below.

Emergent Themes

1. **Career-focused activities at all sample schools increased over the period of EEDA policy implementation.**

Observations and data collected from schools indicate that the policy increased the amount and variety of career-focused activities and guidance at sample high schools, with school counselors playing key roles in providing these activities. The nature of the events and the types of career experiences they provided for students varied across schools.

2. **Initial increased funding and the addition of staff for the enhanced guidance model at schools helped launch implementation of the EEDA reform policy. Subsequent cuts in funding were reported to have slowed the program's progress and caused schools to make difficult choices relative to setting priorities for allocating scarce resources.**

Initial site visits to schools provided data on myriad new activities being implemented and information being disseminated relative to the EEDA policy and its potential to benefit students, industry, the community, and beyond. But the recession brought challenges to schools in keeping up with implementation of policy initiatives. In spite of these challenges, however, some sample schools remained committed enough to career-focused education to sustain policy implementation at their schools.

3. **A broad range of resources is required for successful implementation of such a comprehensive reform policy.**

Full implementation of such an ambitious and high-cost reform as the EEDA model requires a commitment to the provision of sufficient financial support for schools and consideration of economic realities. Not surprisingly, policy implementation was facilitated at schools that had access to a wide variety of resources, such as having staff with prior knowledge of and experience with various policy areas or being located in a community with diverse local

businesses willing to provide resources and educational opportunities for students. Most schools, however, were struggling to meet all the new mandates.

4. **Exposure to the EEDA policy benefitted students across our sample schools, even at schools with lower levels of policy implementation.**

Students in all schools were benefitting in a variety of ways from implementation of the EEDA policy, particularly through the IGP process. The IGP process helped students get started with career planning, think about and develop future career goals, and then connect their coursework to those goals. For a majority of the students surveyed and interviewed across sample schools, this type of planning helped them to feel more engaged in school, less likely to want to drop out, and more motivated to make better grades.

5. **EEDA policy increased awareness and knowledge of CTE at sample schools.**

In large part due to the IGP process, EEDA increased school personnel and student awareness and knowledge of CTE courses and programs and their importance to POS. This increase in CTE awareness and the IGP process were also facilitating more appropriate placement of students in courses based on interest and ability levels and reducing stigma attached to taking CTE courses at a number of sample schools.

6. **Components of the EEDA policy were helping to build some of the foundational elements and framework for the development and successful implementation of Perkins IV-defined POS.**

Although we did not find many POS at sample schools that met all of the study-defined criteria for the Perkins IV core elements, our qualitative data revealed that components of EEDA were helping to build some of the foundational elements and framework considered necessary for the development and successful implementation of Perkins IV POS. Various foundational elements were being put into place across our sample schools leading to the potential for the development of more POS in schools over time.

7. **The expanded Perkins IV model of POS is relevant across the curriculum, not just for CTE programs.**

CTE program elements and the expanded Perkins IV model can direct career-focused education for all students, regardless of subject area. Linking secondary and postsecondary programs, providing contextual learning, building business and community partnerships to build POS and provide students with work-based learning experiences, and emphasizing integration of rigorous academic and technical content are critical to all subject areas. In addition, CTE and non-CTE students and students at all performance levels need the benefits of career guidance and goal setting and being able to connect what happens in school to life after high school graduation.

8. **Building on existing programs and whole-school reform efforts helped to facilitate development and implementation of POS.**

Having the ability to build on existing programs seemed to be particularly important to successful early policy implementation in sample schools and in the development of POS. This included building on existing CTE programs or other initiatives that shared complementary goals and/or established the structure and culture for success, such as the High Schools That Work (HSTW) and Smaller Learning Communities school reform models.

9. Structured guidance for career planning and academic advisement was a critical underlying element for policy implementation and student participation in career planning and POS.

Fundamental to policy implementation was the strong emphasis on combining both career-focused guidance and academic advisement in EEDA and the requirements of the IGP process. This career-focused guidance approach increased the depth and breadth of information that students received about their educational and career opportunities in CTE-related fields and was an essential channel for dissemination of information to students about available POS. It also helped to promote CTE programs to students and engage parents in their children's course and career planning.

10. The Individual Graduation Plan (IGP) development process emerged as an essential component of policy implementation and the promotion of POS.

The development and maintenance of students' four-year IGPs emerged as an essential component of EEDA policy implementation and the promotion of POS in general**.** Guidance personnel, teachers, and students all pointed to IGP development as a valuable tool for career counseling and planning and said that it had facilitated increased counselor interactions with students on career- and course-related issues, taught students ways of thinking about career planning, and helped to make it more likely that courses were related to students' interests and courses of study.

11. School administration and staff buy-in was a key factor related to successful policy and POS implementation.

There was substantial variance in reports of initial school response to the EEDA career pathways model. Some schools immediately embraced the career pathways model, whereas others seemed overwhelmed by the policy demands. Although not the single most important factor, having buy-in from administrators and staff helped to facilitate policy implementation as well as POS development. At the two schools found to have POS meeting study-defined criteria for the Perkins IV core elements, there was strong buy-in to the state policy from school administrators and staff.

12. Quality, long-term partnerships and collaboration were keys to policy and POS implementation.

Partnerships appeared to be necessary to the development of POS, but the key was the nature and strength of those partnerships. The level of policy implementation at sample schools that were located in communities with diverse local businesses that were willing to partner with the school

and provide a variety of resources, such as guest speakers, internships, and work-based learning experiences, was often higher than at schools without access to such partners. Strong relationships between high school career centers and local community colleges were also critical to POS development and instrumental in creating strong course alignment and smooth pathways into postsecondary training and education.

About This Technical Report

This technical report has three parts. The first part, the main technical report, includes this executive summary, a brief review of relevant prior research, a summary of study methodology, and main findings and conclusions regarding the implementation and effects of POS. To provide context for this technical report—that is, an assessment of the extent to which the "treatment" was administered—Technical Appendix A[1] focuses on the implementation of EEDA and discusses the six primary facets of EEDA that the study team identified and the evidence regarding these facets, especially the effects of enhanced guidance and counseling on career development. Technical Appendix B[2] includes a full discussion of the study's design, the conceptualization and measurement of key variables, examples of site visit and focus group protocols and data collection instruments, and other supporting materials.

[1] http://bit.ly/YTcfhN
[2] http://bit.ly/14EWPSk

Chapter 1: Introduction

This technical report contains the final results of a five-year study of South Carolina's Personal Pathways to Success Initiative, which was authorized by the state's Education and Economic Development Act (EEDA) in 2005. The Personal Pathways initiative is a career-focused school reform model intended to improve student achievement and preparedness for postsecondary education and high-skill, high-wage, and high-demand jobs. EEDA was designed to achieve these results through a focus on career awareness and exploration at all school levels and through the creation of locally relevant career pathways and programs of study. The goals of EEDA are closely aligned with those of the Carl D. Perkins Career and Technical Education Act of 2006, also known as Perkins IV, which allowed us to examine the effects of Perkins IV in the context of a highly supportive state policy.[3]

EEDA became law in South Carolina a little more than one year before Perkins IV was enacted at the federal level. Perkins IV is the most recent reauthorization of legislation dating back to 1917 governing the federal investment in the field that used to be termed *vocational and technical education* and is now known as *career and technical education* (CTE). The current legislation is the fourth reauthorization to carry the name of Carl Perkins. The major innovation introduced in Perkins IV was the requirement that all recipients of federal funds for CTE must offer at least one program of study (POS) that includes the following four core elements:

1. incorporate secondary education and postsecondary education elements;
2. include coherent and rigorous content aligned with challenging academic standards and relevant career and technical content in a coordinated, nonduplicative progression of courses that align secondary education with postsecondary education to adequately prepare students to succeed in postsecondary education;
3. may include the opportunity for secondary education students to participate in dual or concurrent enrollment programs or other ways to acquire postsecondary education credits; and
4. lead to an industry-recognized credential or certificate at the postsecondary level, or an associate or baccalaureate degree (P.L. 109-270, Sec.122 c 1A)

The legislation's requirements for POS are an attempt to improve the rigor of CTE programs and ensure that students have the skills needed to successfully transition from high school to postsecondary education or employment. This emphasis on rigor and preparation beyond high school is part of a larger national discussion about how to help students enter the workforce with the academic, technical, and workplace readiness skills they need to compete in a rapidly changing global economy.

One benefit of a global economy is the potential to increase efficiencies of production and therefore the standard of living of people around the world. Another benefit is the speed and frequency in the exchange of ideas and capital among those who work and those who employ workers. The benefits of this global economy, however, are often overshadowed by local difficulties experienced due to a changing industrial base. For example, the textiles, textile products, and apparel manufacturing industry sector was once dominant in South Carolina,

[3] A list of acronyms used throughout this report can be found following the Table of Contents.

providing individuals with opportunities for lifelong employment in jobs with good wages. Since 1996, 44% of all U.S. textile jobs have been lost to overseas competition (DuPlessis, 2006) and the U.S. Department of Labor's Bureau of Labor Statistics predicts that employment in this industry sector is expected to decline by another 35% through 2016 (U.S. Department of Labor, Bureau of Labor Statistics, 2008). This contrasts with a projected increase of 11% between 2006 and 2016 for all industries combined (U.S. Department of Labor, Bureau of Labor Statistics, 2008). Clearly, there have been and will be individuals and communities that benefit more or less in a changing economy. Such changes have been particularly difficult for the many South Carolinians who have depended on employment in the textile or agriculture industries.

Key to thriving in a changing economy is having the skills necessary to compete in that economy. Comprehensive school reform, particularly high school reform through CTE that leads to meaningful postsecondary options, is critical to the successful education and training for those who will compete in this changing, global economy. Most of today's workforce must undertake some kind of postsecondary training or education to be prepared to fill an array of emerging high skill-level jobs of the future workforce. Students, communities, and society at large benefit when students make the transition from high school to two- and four-year postsecondary programs or to work as smoothly and as quickly as possible and without the need for remediation. Early, individualized exposure to career and training information, opportunities for dual enrollment and dual credit, and statewide or regional articulation agreements can help serve this purpose.

Relevance of the Study to the Field of CTE

CTE reform and implementation of career pathways models are taking place across the nation, particularly with the passage of Perkins IV, and implementation of education reforms similar to some components of EEDA varies widely. Castellano, Harrison, and Schneider (2008) found that across states, CTE standards were often being implemented in a patchwork fashion. This approach to reform may help explain the mixed results described in studies on CTE reform and implementation. Castellano et al. (2008) investigated state secondary technical standards for CTE and found a wide and varied distribution of legislation across secondary schools in the United States. This "steady stream" (Castellano et al., 2008, p. 1) of standards-based legislation has apparently developed into a river since the 2006 enactment of Perkins IV, which required CTE POS to "include coherent and rigorous content aligned with challenging academic standards and relevant career and technical content in a coordinated, non-duplicative progression of courses that align secondary education with postsecondary education to adequately prepare students to succeed in postsecondary education" (Perkins IV Act of 2006, § 122(c)(A)(ii)). However, in their research on state policies, Castellano et al. (2008) found that, although educational administrators continued defining these CTE content standards, most states' CTE reform plans were more a patchwork of bits and pieces of programs, in contrast to South Carolina's comprehensive legislation, which attempts to address all of the basic requirements found in Perkins IV in addition to many of its supportive structures.

EEDA is an ambitious piece of legislation and is unique among otherwise similar state legislation for its comprehensiveness. A study of this legislation is significant in that it can provide an in-depth look at whether a clear statewide mandate to provide coherent POS-based educational opportunities is more effective in producing desired student outcomes than the

patchwork POS approaches adopted by other states. The policies mandated by the EEDA legislation are significantly different from the ad hoc approaches described by Castellano et al. (2008). Should these policies increase the number of career-focused POS and student success in high school and beyond, EEDA may serve as a model for states as they work to improve high school performance and student outcomes. Analyses of how such policies were implemented can inform educators nationwide as they consider what best supports the development of POS in various local economic and school organizational settings.

To help states and local recipients meet the requirements of Perkins IV, OVAE worked with a number of national associations, organizations, and states to develop a framework of supporting components and subcomponents that form a "career and technical programs of study design framework" (U.S. Department of Education, 2010; see Technical Appendix B). This framework includes "a system of 10 components that, taken together, support the development and implementation of effective POS. Although all 10 components are important, they are neither independent nor of equal priority: State and local program developers must identify the most pressing components for state or local adoption, taking into consideration their relative need within their educational context" (U.S. Department of Education, 2010, p.1).

The 10 components that comprise the framework include: Legislation and Policies; Partnerships; Professional Development; Accountability and Evaluation Systems; College and Career Readiness Standards; Course Sequences; Credit Transfer Agreements; Guidance Counseling and Academic Advisement; Teaching and Learning Strategies; and Technical Skills Assessments. EEDA includes nearly all of these supporting components, but is particularly strong in the areas of legislation and policies, credit transfer agreements, and guidance counseling and academic advisement.

Although EEDA preceded Perkins IV, it required South Carolina schools to implement reforms that incorporate nearly all of the core and supporting components considered necessary for the successful development of Perkins IV-funded POS, as well as additional elements that could support and sustain the implementation of POS. For example, EEDA components include the organization of high school curricula around career clusters, an enhanced role for school counselors, and extra assistance for high-risk students. Further, the law mandates evidence-based high school reform, regional education centers charged with facilitating business-education partnerships, and greater articulation between secondary and postsecondary education.

The similarity in the goals of EEDA and Perkins IV, and the short time period between their passage, provided an excellent opportunity for the NRCCTE to study the implementation of POS in the context of highly aligned state policy that was also in the early stages of implementation. For this study, data were gathered and reports produced by researchers at the National Dropout Prevention Center (NDPC) at Clemson University and by faculty at the University of Louisville. The findings presented in this final technical report relate not only to how the EEDA reform policy played out in selected high schools but also specifically the effect the reform policy may have on the development of POS.

This study tested the hypothesis that not only does a statewide mandate like the EEDA increase the number of POS in schools, but also that the number of POS, in combination with various

political, economic, and social characteristics, influences selected outcomes for South Carolina's secondary students and the schools they attend. This hypothesis was tested through the following research questions:

1. To what extent does South Carolina's EEDA facilitate the development of POS?
2. What impact does the level of local economic resources have on the implementation of EEDA and the development and implementation of POS?
3. What impact does the implementation of EEDA and the POS required by Perkins IV have on student high school outcomes and postgraduation preparation and plans?

We originally had four research questions. The first two were the same as those presented above, but the third was divided into two parts that attempted to assess the separate impacts of EEDA and POS as mandated by Perkins IV. We collected data that we considered appropriate to answer these separate questions. Once we analyzed those data, however, it became clear that it was not possible to attribute impacts to the separate acts. Their implementation was so parallel and intertwined that the impacts that we could identify appeared to be the results of their combined effects. We could not answer the two separate questions, but we did produce findings related to the modified question. In Chapter 2, we present our answers to these three research questions. In the remainder of this chapter, we review prior research related to the three questions and provide an overview of the methods we used to assemble the data analyzed to answer each.

Career-Focused Education and Career Planning and Development

Research indicates that students can benefit from career-focused education offered through POS, career clusters, and CTE. Such programs provide opportunities for students to engage in career exploration and development, establish short-term and long-term goals, learn about a variety of career options, increase academic knowledge and skills, establish a career identity, test career preferences in applied settings, and make links between coursework and postsecondary careers and education (Gray, 2004; Gysbers, 2008; Kalchick & Oertle, 2010; Lewis & Kosine, 2008; Rojewksi & Kim, 2003). There is evidence that engaging in POS facilitates students' participation in career planning and development and ultimately results in greater career awareness, a stronger career identity, and more explicit career goals (Lewis & Kosine, 2008; Perry, Liu, & Pabian, 2010).

A report from the Harvard Graduate School of Education recommends broader, improved school reform with high-quality CTE as a key element (Symonds, Schwartz, & Ferguson, 2011). The authors of this report outlined three current challenges for achieving this goal: (a) the existence of the "forgotten half" (referring back to a 1988 W. T. Grant Foundation report that millions of non-college-bound youth are in danger of being denied full participation in society); (b) a more demanding labor market, in which it is estimated that nearly two-thirds of new jobs that will be created in the next seven years will require some postsecondary education (e.g., associate's degrees, certifications); and (c) widening skills and opportunity gaps, because a "focus on college readiness alone does not equip young people with all of the skills and abilities they will need in the workplace, or to successfully complete the transition from adolescence to adulthood" (Symonds et al., 2011, p. 4).

Their three-point solution (Symonds et al., 2011) to these challenges is similar in many ways to what may be part of high-quality CTE POS policy. This includes the development of: (a) a broader vision of school reform that incorporates multiple pathways from high school to adulthood, (b) a much expanded role for employers in supporting these new pathways, and (c) a new social compact between society and its young people. Symonds et al. pointed to some cutting-edge CTE pathways-type programs existing in many U.S. states and communities that are having positive effects on dropout and graduation rates, school engagement, and workforce salaries. According to the authors, the following elements are essential to the successful implementation of career pathways: improved career counseling in both secondary and postsecondary schools, improved consistency in the quality of CTE programs so that programs are available to all students and can be aligned across school levels, and a reduction of cultural barriers and stigma associated with CTE.

Integrating career counseling in the context of career pathways encourages students to initiate career planning at the beginning of high school and facilitates smoother transitions to postsecondary work and education options (Hull, 2005). As a result, students are better prepared to reach their career goals and aspirations. In a similar way, POS connect coursework to work-based learning and allow students to access support structures (e.g., CTE student organizations, skill-based competitions, real-world classroom projects, and work-based learning) that can facilitate their career planning (McCharen & High, 2010).

By making career exploration and planning central to CTE and school-based reform, career development efforts can become intentional, in contrast to previous programs in which career development seemed to be a by-product of curriculum efforts (Lewis & Kosine, 2008). As a result, guidance counselors can serve as a catalyst for facilitating career pathway partnerships (Hull, 2005). For career development to be successful, however, competing demands for guidance counselors' time need to be addressed so that counselors have time to assist students with career planning (Association for Career and Technical Education, 2008; Hughes & Karp, 2006).

Additional research suggests that CTE influences participation in career planning and development. High school students who take CTE courses feel more certain about their career direction and goals (Lekes et al., 2007; Offenstein, Moore, & Shulock, 2009) and feel more prepared for their occupational futures than do non-CTE students (Bennett, 2007). Also, in comparison to non-CTE students, CTE students feel more prepared to transition to college, believe that their high school POS had provided them with relevant information about college programs and courses, and feel more confident about and satisfied with their college and career choices (Lekes et al., 2007). These students were also more likely than non-CTE participants to report that they developed a number of personal and professional skills important to workplace success, such as problem-solving, project completion, communication, time management, and critical thinking (Lekes et al., 2007). Such so-called soft skills are often the target of school-based reform efforts like the EEDA.

Plank's (2001) research indicates that students who take CTE classes in a certain proportion to academic classes are less likely to drop out of school. Plank found that a balanced combination of CTE and academic courses may reduce the probability of dropout. For lower-ability youth, he

concluded that a little more than half of the total high school coursework should be invested in CTE to maximize the likelihood of staying in school. Later research (Plank, DeLuca, & Estacion, 2005) concluded that one CTE credit for every two core academic credits was the ratio most associated with decreased likelihood of dropping out; however, both a higher and a lower ratio than 1:2 could have a negative effect on dropout. Castellano et al. (2007) also found a link between CTE and decreased dropout, concluding that the odds of a student dropping out of high school decreases as the proportion of CTE courses to core courses increases. The potential for students to strike a balance between CTE and academic courses is being tested, however, in the context of the No Child Left Behind (NCLB) legislation. Fletcher (2006) argued that so much—for both individuals and schools—is riding on performance in core curriculum areas for NCLB, that other areas, such as CTE, may be falling by the wayside, to the detriment of NCLB's long-term goals.

In the context of CTE and career pathways models, individual career plans (ICPs) and work-based learning opportunities are particularly important elements of career planning and development. Perkins IV encourages schools to develop ICPs as a part of a comprehensive approach to CTE. The American School Counselors Association (ASCA) has endorsed these plans as well. As a student-centered career plan, an ICP is more than just a checklist; it teaches students "how to use their [plans] to guide their actions and actualize their education and career aspirations" (Kalchick & Oertle, 2011, p. 6). Individual learning plans (such as ICPs) contribute to increased student self-sufficiency, self-efficacy, and self-determination in career development and planning (Kalchick & Oertle, 2011), and increased academic achievement and school engagement (Gysbers, 2008). This comprehensive approach makes career pathways more apparent to students, involves them proactively in the career planning process, and supports student planning for both academic curriculum choices and careers (Grubb, 1996; Stern, Raby, & Dayton, 1992).

Many POS include explicit opportunities for students to obtain real-world work experiences through job shadowing, internships, school-based enterprises, and cooperative (co-op) educational experiences. These opportunities expose students to a variety of career options, help students to clarify career goals, increase their confidence in their occupational identities and choices, and improve their capacity to engage in career planning that best suits their goals and aspirations (Bailey, Hughes, & Moore, 2004; Zeldin & Charner, 1996). Students also have the opportunity to develop positive relationships with adults other than their parents and teachers (Bailey et al., 2004).

Ryken (2004) identified additional benefits of work-based learning, including higher levels of student engagement in school, increased school retention and graduation rates and greater success in the labor market. Bennett's (2007) research on work-based learning revealed that CTE students benefitted more than non-CTE students from the social support offered through work-based learning. Lynch (2000) asserted that such programs should be included for students in all high school majors (e.g., performing arts or math and science) and not just CTE students.

Traditionally, vocational education has been viewed and structured as alternative education, separate from "regular" educational programs, for students uninterested in or unable to attend college, who are not able to sit through regular classroom lectures, and who need a curriculum

that is more hands-on and according to some, less demanding. Wonacott (2000) found that educators in general have seen CTE as a place for the non-college bound, potential dropouts, and special needs students. Similarly, research reviewed by Castellano, Stringfield, and Stone (2003) found that traditionally, CTE has been considered as more appropriate for students at risk of not finishing high school or for those not going on to any postsecondary education. At the beginning of the 21st century, the term "vocational education" still carried a negative connotation [viz., "parents, students and employers hold stereotypes about career and technical education" (Brown, 2003, p. 1)]

The language and mandates of the latest iterations of Perkins were designed to redefine vocational education. Included in Perkins IV was an official name change from vocational education to CTE. Effective CTE programs prepare students for further postsecondary education and careers, include more academic content in their curricula, and demonstrate more clearly how academic concepts are applied to technical or occupational settings (American Youth Policy Forum, 2009). That is, with CTE no longer being segregated from academic education and as CTE students are now being prepared for both careers and postsecondary education (DeLuca, Plank, & Estacion, 2006; Gordon, 2008), CTE is becoming a significant part of *all* students' educational pathways. A study of Class of 2005 graduates found that nearly 97% of high school graduates took a CTE course during high school (Levesque et al., 2008).

Counseling and Guidance in CTE and POS

Finding stable and profitable employment in today's global economy requires not only education and proficient work skills, but also career know-how. In a highly competitive market with few jobs available, students need an edge in finding the right career fit, one that meets both their personal needs and a demand within their community. In order for students to make effective educational and career choices, they need guidance from knowledgeable and experienced adults who can provide them with information regarding careers, help them to engage in self-exploration, and provide opportunities for work-based experiences.

Although career and educational guidance in K-12 is rooted in school counseling services (Pope, 2009), major limitations have been identified in the delivery of comprehensive career counseling services provided by school counselors. For example, Public Agenda surveyed 600 young adults about their experiences with school counselors. These participants rated school counselors poorly on their efforts to help them think about careers, find ways to pay for college, and tackle the college application process (Johnson, Rochkind, Ott, & DuPont, 2010). Focus groups conducted as part of the study found that students who weren't considered "college material" characterized their meetings with counselors as "dispiriting and unhelpful" (Johnson et al., 2010, p. 7). In addition, poor career and educational guidance has been linked with at-risk students' reluctance to pursue postsecondary education and training (Plank & Jordan, 2001).

Other studies have found that school counselors do not spend sufficient time providing career and postsecondary guidance services to students (Osborn & Baggerly, 2004; Plank & Jordan, 2001). Although school counselors report that they would like to spend more time engaging in career counseling activities (Osborn & Baggerly, 2004), unmanageable student caseloads and high demands on their time have been identified as the major reasons for their inability to do so,

affecting not only career counseling but other counseling services as well (McCarthy et al., 2010). A large number of school counselors report engaging in noncounseling or otherwise inappropriate duties and state that these duties interfere with their ability to provide appropriate counseling services (Pérusse et al., 2004). Such issues have greatly contributed to the inadequate career and educational planning now evident in many schools (Trusty, Niles, & Carney, 2005).

In response to students' need for reliable career information about post-high school opportunities, including postsecondary education (both two- and four-year), training and certificate programs, and employment options, there has been a growing call to increase the amount and specialization of career counseling and guidance services to students through school counseling programs (e.g., Association for Career and Technical Education, 2008; Carnevale & Desrochers, 2003; Feller, 2003; Huss & Banks, 2001; Rosenbaum & Person, 2003). OVAE's (2010) design framework included guidance counseling and advisement as a major component of high-quality POS.

In order to provide students with comprehensive counseling services, efforts have been made to develop school counseling programs that directly affect student outcomes (Dahir, Burnham, & Stone, 2009). For example, ASCA's (2005) National Model emphasizes the role of school counselors in providing comprehensive career guidance. This model endorses the delivery of career development services through multiple avenues including the school guidance curriculum, individual student planning, responsive services, and system support. In addition, the model encourages school counselors to assist students in several areas, including developing career awareness, identifying career goals, developing employment readiness skills, acquiring career information, acquiring knowledge to achieve career goals, and applying skills to achieve career goals.

OVAE's 2010 recommendations regarding comprehensive career guidance are based on the National Career Development Association's (NCDA) National Career Development Guidelines (n.d.), which promote the role of counseling professionals in such areas as aiding students in career decision-making, providing students with tools and information about postsecondary and career options, and providing students with career assessment data. These goals align strongly with those of the ASCA National Model, which is also based on NCDA guidelines. Further, in schools with a POS framework, there is a strong alignment between school goals and counseling program goals, such as offering career majors that provide a framework for organizing courses, faculty, and work-based learning activities around specific career clusters and that provide a pathway to postsecondary education and training (Stone & Aliaga, 2005). Counselors in these settings provide students with focused comprehensive career counseling services so that students are better able to make career-based decisions that lead to a seamless transition from high school to postsecondary education, training, or work.

Finally, evidence shows that providing students with comprehensive career guidance services helps them in career planning and leads to better career outcomes (e.g., Lapan, Gysbers, & Sun, 1997; Utah State Office of Education, 2000). For example, Lapan, Aoyagi, and Kayson (2007) found that students who received career development services reported greater career awareness and higher levels of career exploration and planning than those who did not receive such services. The study also described several long-term effects of career counseling, including

higher levels of success in transitioning into life roles, a better sense of direction in careers, and higher levels of overall life satisfaction. In addition, Nelson, Gardner, and Fox (1998), using a measurement scale based on the state of Utah's Comprehensive Guidance Program, found that students in highly implemented guidance programs felt better prepared for employment and in furthering their education.

Study Design

This five-year study investigated the extent to which a statewide reform mandate like the EEDA facilitates the creation of career pathways and POS (as defined in Perkins IV) in various high school contexts and whether these POS lead to improved student high school and postgraduation preparation and planning. This study also explored the influence of the availability of school and community resources and future employment opportunities—whether substantial or limited—on the development of POS and the outcomes of students enrolled in them.

The study employed a quasi-experimental design with a mixed-methods, triangulated approach (Tashakkori & Teddlie, 2002) and followed two student cohorts from a sample of eight high schools from economically and culturally diverse regions of South Carolina.

The school sample was carefully drawn through a four-stage sampling process and selected to vary on critical study factors: (a) employment opportunities and industrial mix, (b) local school and community economic conditions, and (c) initial levels of EEDA implementation. Eight high schools met the sampling criteria and agreed to participate in the study. At each of these high schools data were collected from two cohorts of students with varying levels of exposure to the reforms mandated by EEDA. These cohorts included those who graduated in 2009 (who had little exposure to EEDA) and those who graduated in 2011 (with increased exposure, especially from the tenth to twelfth grades).

Data Collection

To create a broader understanding of EEDA's influence on schools, teachers, students, and the creation of POS, various quantitative and qualitative data were collected and analyzed. Quantitative data included student outcome and survey data from the Classes of 2009 and 2011 and survey data from guidance personnel. From the South Carolina Department of Education (SDE) statewide longitudinal data system (SLDS), we collected student and school-level longitudinal demographic, attendance, and discipline data; eighth-grade standardized test scores; course histories; and Individual Graduation Plan (IGP) data (including declaration of majors, intentions to complete majors, and postsecondary plans). From the SDE Office of Career and Technical Education (SDE CATE), we collected school-level data on state-recognized CTE programs and enrollment in these programs over the study period.

The student survey was developed in collaboration with the NRCCTE's two other longitudinal POS studies. This *Student Engagement/POS Experiences Survey* covered a range of topics, including questions regarding career clusters, career planning and development, the development of IGPs, majors, coursework, school engagement, and demographic characteristics. The Class of

2009 was surveyed once, just prior to high school graduation, and the Class of 2011 was surveyed twice, once following tenth grade and again just prior to graduation.

Guidance personnel were surveyed about their involvement in career-focused education and the development of student IGPs and about changes in their assigned duties since the implementation of the main elements of EEDA related to high school guidance responsibilities. The duties included those related to curriculum development and counseling and classroom guidance for students in the areas of career, academic, and social development; consulting with other school staff or parents; coordination activities related to special events and professional development; and "inappropriate" duties (based on EEDA guidelines), such as administering standardized tests and developing the master class schedule. Surveys were administered to guidance personnel in the Fall of 2009 and the Spring of 2012.

Qualitative data included perspectives gleaned from interviews and focus groups conducted with school principals, counselors, teachers, and students, as well as community college administrators. Content from course catalogs and other career-related materials was also analyzed. Three site visits to each school were conducted during the study period. The first was an initial visit to potential sample schools, in Spring 2009, focused on the primary goal of understanding the level of ongoing EEDA activities at the school, and included interviews with school principals and guidance directors and focus groups with assistant principals, guidance personnel, and diverse groups of ninth- and tenth-grade teachers. The second round of site visits, in Fall 2009, were geared toward collecting data on the development and implementation of POS and associations between POS and the state policy. During these visits, individual and focus group interviews were conducted with guidance personnel, curriculum coordinators, CTE coordinators and faculty, partner career center staff (where relevant), and partner college administrators and faculty. In-depth, follow-up phone interviews were conducted with school counselors in the Spring of 2010 in order to further explore policy and POS implementation and the impact of these on their duties. A third site visit was conducted at each school in Spring 2011 to conduct focus group interviews with the Class of 2011 as seniors. Additional phone interviews were conducted with school counselors in Spring 2012.

In order to analyze these varied data sources and address our research questions, we constructed a number of contextual and analysis variables. We developed a scheme to score the level of policy implementation at each school that included the collection and analysis of relevant quantitative and qualitative data on the six most salient facets of EEDA related to high schools. A community poverty four-factor index for school-level analysis was developed to be able to score each school on level of community resources. Varied measures of POS were also constructed, based on quantitative data (which we labeled POS1, POS2, and POS3) or a mixture of quantitative and qualitative data (POS4, POS5, and POS6).

At the time of site visit interviews, many schools and districts were in the early stages of developing clusters and career majors. This represented a considerable challenge to our development of our POS measures because there was little consistency in majors and POS across schools. Data from different sources could not be linked on common program names and definitions. Also, EEDA encompasses more than just CTE courses and programs and requires the development of POS across the curriculum in all subject areas. We therefore needed to devise

a method to select only those majors/programs that were strictly CTE because that was the focus of our study. In addition, once we identified majors/programs to review, we found that the elements of Perkins IV POS, as outlined in the legislation and supporting implementation materials provided by OVAE, were not sufficiently defined to allow for easy translation into direct measures for each element. This required us to develop our own operational definitions for our analyses. The methods and data we used to derive our six measures are summarized in connection with the analysis of the measures in Chapter 2 and in more depth in Technical Appendix B: Constructed Contextual and Analysis Variables.

Chapter 2: Findings

This chapter is organized according to our three research questions. Many of our analyses compare data from the school year 2008-2009 to those from 2010-2011, a three-year period early in the implementation of both EEDA and Perkins IV. Given this time period and the magnitude of the changes both pieces of legislation were designed to bring about, it is not surprising that most of our findings show only limited impact. Overall, the schools we studied were moving in mandated directions, but most of our analyses found that the changes that had been implemented had not produced the results desired.

Development and Implementation of Perkins IV-Defined POS

Our first research question asked "To what extent does South Carolina's EEDA facilitate the development of POS?" In Technical Appendix A, we describe the level of implementation of the policy across schools in order to generate an estimate of how much of the "treatment"—or levels of implementation of the EEDA policy—students were exposed to at each of the sample schools. The next step in addressing this question was to explore the possible subsequent influence of the various levels of EEDA implementation on the development of POS. This second aspect of the question required us to operationalize the concept of *program of study*. We faced several challenges when trying to operationalize POS. EEDA encompasses more than just CTE courses and programs, and it was necessary to develop measures that could be applied across the entire high school curriculum or at least a wider range of career pathways. Particular majors and programs offered to students were left up to individual schools and districts, leading to inconsistent naming and Classification of Instructional Programs (CIP) code assignments as well as varied placement in career clusters. In addition, the elements of Perkins IV POS, as outlined in the law and supporting implementation materials provided by OVAE, were not sufficiently defined to allow for easy translation into direct measures for each element. These and other challenges are described in further detail in Technical Appendix B: Defining and Counting Perkins POS.

To address these challenges, we sought to operationalize the Perkins IV core elements. We used several alternative approaches from varied data sources to present a broad picture of POS at sample schools. We identified two state data sources available for the school years of most interest to the study (2008-2009 to 2010-2011) that provided quantitative information on POS from slightly different angles using differing approaches. The third data source, a student survey, was developed and administered during the study period. These data sources were used to develop our three primary analysis variables. In addition, we used qualitative data to supplement the quantitative data, so that when pieced together, a broader picture of the level of development of POS at our sample schools could be provided.

The three primary variables used in analysis, POS1, POS2, and POS3, came from three different data sources. POS1 variables are derived from the South Carolina State Department of Education's (SDE) State Longitudinal Data System (SLDS) and follow two cohorts of students, the Class of 2009 and the Class of 2011, from tenth through twelfth grades in our sample schools using available student-level data. Data for the POS2 variables, also derived from the SDE, came from their Career and Technical Education (CATE) office database that is used for Perkins IV

reporting to OVAE on state-recognized CTE programs and participants. The CATE data do not follow specific cohorts but are reported by enrollment by year and could include students in a variety of cohorts. In addition, the CATE data analyzed here included school-level, rather than student-level, data. So, although not directly comparable, POS1 and POS2 data and variables are complementary and offer opportunities for comparison across data sources; they also add unique perspectives not offered through the other data source.

POS3 variables are based on survey response data collected from our two target cohorts, the Class of 2009 and the Class of 2011. The *Student Engagement/POS Experiences Survey* was administered to the Class of 2009 as seniors and to the Class of 2011 as sophomores and again as seniors. Students were not randomly selected for survey administration. Instead, each school was asked to survey as many in the targeted cohort as possible in the targeted school year. These data are therefore not comparable to the POS1 and POS2 data, but do provide additional information not available through the other data sources. Thus, they contribute to a fuller picture of the students' experiences of the policy and POS at sample schools.

In addition to the primary variables, other secondary and more descriptive variables were developed or obtained to supplement the information provided by the POS1, POS2 and POS3 variables. The Study-Designed Perkins IV POS POS4 variable was developed by the research team to measure the four core elements of the Perkins IV legislation. The other two descriptive variables, District-Identified CATE Perkins IV POS (POS5) and School-Reported POS (POS6) variables were developed from other sources described in Technical Appendix B. This supplementary information was gleaned from on-site interviews and focus groups conducted during the two site visits with guidance personnel, teachers, principals, and assistant principals; from student focus group interviews conducted during a third site visit to each school; from content analysis of school archival and web materials on available courses, majors, and career clusters, and on career development and planning; from analysis of school responses to a Clusters & Majors checklist; and from information compiled from an SDE CATE annual report.

Findings from the three primary analysis variables as well as the descriptive variables are described below.

POS1 Students

Data used to develop POS1 variables are student-level from the SDE's SLDS. Students were considered to be in either the 2009 or 2011 SLDS cohort if they were at sample schools the last three years of high school and progressed through the tenth, eleventh, and twelfth grades during those last school years. They were considered SLDS cohort POS1 students if they completed four or more credits in a logical progression of at least three CTE courses that complete at least four credits in a single cluster. It is important to keep in mind, particularly as we compare POS1 results to POS2 results, that POS1s are course sequences within a cluster but do not necessarily reflect a recognized CTE major or program as is the case for POS2s.)

Defining the cohorts in this way (i.e., the number of consecutive years used to define the cohort), impacted the percentage of students identified as completing a POS1 course sequence (POS1s). Table 2.1 uses the 2011 SLDS cohort to illustrate the variation in the school-level percentages,

depending on the definition of the cohort. The percentage of POS1 students (students completing a CTE course sequence) increases for all schools as more grade levels are included. The percentages being used for our analysis, except where noted, are in the third column, "Percent in 10th through 12th grade." The percentage of students who completed POS1 course sequences (percent POS1 students) varied widely across schools for the 2011 graduating cohort. Overall, approximately 15% of students completed a POS1, but the percent POS1 students across schools ranged from less than 1% to around 36%.

Table 2.1
Percent POS1 Students, by Varying Cohort Definitions, 2011 SLDS Cohort

School	Percent in 12th Grade	Percent in 11th and 12th Grade	Percent in 10th through 12th grade	Number of POS1 Students in Analysis Cohort
Apple	24.5	28.9	33.3	26
Azalea	5.0	5.5	5.7	6
Elm	17.4	21.5	23.3	37
Iris	31.1	33.7	36.1	56
Laurel	9.9	10.8	11.8	43
Orchid	8.7	10.9	12.3	30
Poplar	0.5	0.5	0.6	2
Redwood	19.3	22.9	24.9	44
Total	11.8	13.8	15.1	244

Comparisons between the 2009 and 2011 SLDS cohorts (Table 2.2) indicate that only two of the schools had increases in percent POS1 students between the two cohorts. Both of the schools that experienced increases in percent POS1 students, Apple and Laurel,[4] fall in the top half of policy implementation scores, although they are medium policy level schools rather than high level. In addition, the school with the largest decrease in percent POS1 students between the two cohorts, Elm, is a low policy implementation school. However, the school with the second largest decrease in percent POS1 students between the cohorts, Orchid, is one of the two schools with the highest policy implementation scores. This suggests some association between strong policy implementation and increases in the proportion of students completing a POS1 course sequence but not a consistent trend.

Table 2.2
Change in Percent POS1 Students by SLDS Cohort

School	2009 Cohort	2011 Cohort	POS1 Change
Apple	8.2	33.3	25.1**
Laurel	4.0	11.8	7.8**
Poplar	1.6	0.6	-1.0
Redwood	27.2	24.9	-2.4
Iris	38.6	36.1	-2.4
Azalea	9.4	5.7	-3.7

[4] All school names are pseudonyms.

Orchid	17.8	12.3	-5.4
Elm	29.5	23.3	-6.2
Total	15.0	15.1	0.1

Note. Caution should be used in interpreting data from Azalea and Poplar because the number of POS1 students at each of these schools is less than 10. ** $p < .01$.

Apple experienced the greatest increase in percent POS1 students over the period. But as we explored the reasons for this large increase and compared the findings from POS1 to POS2, we felt that this sharp increase in percent POS1 students was an anomaly in the POS1 data. As will be discussed in the next section, in the POS2 data, the percentage of POS2 completers at Apple did increase between the 2009 and 2011 cohorts, but not to the same degree as in POS1 course sequence completers. In addition, the number of POS2 programs available to students in both cohorts during that time period was low—four programs—and remained at that level over the three-year period. Further, a comparison of the numbers of students considered course progression (POS1) or program completers (POS2) between the two data sources (shown later in see Table 2.6) showed far fewer students in the POS1 2009 cohort than those of the POS2 2009 cohort, whereas the numbers of students for the 2011 cohort across the two data sources were very similar. It may also be the case that tracking students' course-taking and inferring that certain course progressions in a cluster represent a CTE program may not be as valid a method at some schools for inferring the presence of POS as it might be for others. We believe, therefore, that this large increase reflected an anomaly in the counting of POS1 for that school for that cohort and do not believe that it reflected the true trend between the two POS1 cohorts.

The other school showing a significant increase, Laurel, was a relatively new school built around EEDA. Laurel experienced a steady growth in CTE programs and percent completers over the three-year period. Established around the time that EEDA legislation was being developed, the school was designed to meet the demands of the new policy for the curriculum to be centered around career majors and clusters. The steady increase probably reflects the school's development of programs over time as the school became more established. As will be discussed in the next section, the number of POS2 programs at Laurel grew from seven programs in the 2008-2009 school year to 21 in the 2010-2011 school year.

The other six schools (Poplar, Redwood, Iris, Azalea, Elm, and Orchid) experienced decreases in percent POS1 students between the two cohorts, although most were relatively small declines. Given that EEDA emphasizes the development of career majors and pathways, we might have expected at least a slight increase in the percentage of POS1 students between the 2009 (pre-policy) and 2011 (early-policy) cohorts at most schools. However, because the policy was in its early stages of implementation for the 2011 cohort, it is possible that this pattern reflects more of a lag in getting programs into place to meet the demands of the new policy. Some schools were developing and/or dropping program offerings during that time period; declines may reflect this adjustment period. It is also important to remember that EEDA seeks to implement POS across the curriculum, not just in CTE, and thus courses offered for CTE programs may have been reduced temporarily, whereas courses for other career majors/pathways were being put into place to meet the requirements of the policy.

POS2: State-Recognized CTE Programs and Enrollment

Data for the POS2 primary variables were derived from the SDE's CATE office and represent data on state-recognized CTE programs and enrollment in those programs over the study period. Unlike POS1, enrollment is not based on specific cohorts but includes any student at a sample school that was considered by the state to be a participant, concentrator, or completer in a state-recognized CTE program that has potential postsecondary ties in a given school year. A *participant* is a secondary student taking one or more CTE courses who is not a concentrator or completer. A *concentrator* is a secondary student with an assigned CIP code who has earned three or more Carnegie units of credit in a state-recognized CTE program. A *completer* is a concentrator who has earned *all* of the required units in a CTE program identified by a CIP code. A state-recognized CTE program must include four or more Carnegie units of credit in CTE courses leading to a career goal. Cosmetology and nail technology programs were excluded because they have no clear postsecondary connection after high school graduation. Students could be in any grade, but were most likely juniors and seniors during each school year.

Unlike our analyses of the POS1 and POS3 variables, POS2 is school-level, with an *n* of only eight. Consequently, significance tests on trends across time are not statistically powerful and are not appropriate for examining between-school relationships.

The SDE CATE office recognized CTE programs in 14 of the 16 career clusters approved by Perkins IV in both the 2008-2009 and 2010-2011 school years. Across our eight sample schools in both 2008-2009 and 2010-2011, there were concentrators or completers in POS2 programs in all 14 of these career clusters (see Table 2.3). The cluster with the most diverse POS2 programs offered across sample schools in 2008-2009 was Business, Management, and Administration with 12 POS2 programs, followed by four in both Manufacturing and Marketing, Sales, and Service. In 2010-2011, the cluster with the most diverse POS2 programs across sample schools was again Business, Management, & Administration with seven programs, although with almost half the number of programs available in that cluster in 2008-2009. In addition, there were four POS2 programs in Manufacturing and four POS2 programs in Architecture and Construction offered across sample schools.

Table 2.3
Sixteen Career Clusters and Variety of CTE Programs in Sample Schools by Cluster and Year, 2008-2009 and 2010-2011

Career Cluster	2008-2009 Number CATE Programs	2010-2011 Number CATE Programs
Agriculture, Food, & Natural Resources	1	3
Architecture & Construction	3	4
Arts, Audio/Video Technology & Communications	3	3
Business, Management & Administration	12	7
Education & Training	1	1
Finance [a]	0	0
Government & Public Administration [a]	0	0
Health Science	2	2
Hospitality and Tourism	1	2

Human Services	3	2
Information Technology	3	2
Law, Public Safety, Corrections & Security	1	3
Manufacturing	4	4
Marketing, Sales & Service	4	3
Science, Technology, Engineering & Mathematics	1	2
Transportation, Distribution & Logistics	3	3

[a] No state-recognized CATE programs were offered in Finance in South Carolina during the 2008-2009 school year, but were added during the 2009-2010 school year. No state-recognized CATE programs were offered in Government and Public Administration in South Carolina between the 2008-2009 and 2010-2011 school years.

An interesting pattern emerged in POS2 programs at our three largest high schools, Laurel, Orchid, and Poplar (Laurel and Poplar were also the most four-year college-oriented). During the study period, these three schools developed a number of custom or cross-cluster POS2 programs. These programs gave the schools more flexibility than the standard state-recognized programs that had set lists of courses and credits required for program completion. Over the period, Poplar offered the most of these programs, with approximately 60% of their POS2 programs being either custom or cross-cluster programs. About 40% of Laurel's POS2 programs were either custom or cross-cluster and about one-third of POS2 programs at Orchid were of this type. Two other schools offered these types of programs, with one being offered during the study period at Azalea and two at Iris.

The average number of POS2 programs at sample schools between 2008-2009 and 2010-2011 was 12.8 programs, with an overall 33.7% increase in the number of programs over the time period. The average number and change in percentage over the period masked differences across schools: The increase in POS2 programs was due mainly to changes at two of the eight sample high schools. As shown in Figure 2.1, two schools, Laurel and Orchid, had large increases in numbers of POS2 programs over the three-year period. During the same period, another school, Iris, had a large decrease in the number of POS2 programs at the school. Three schools had no net change in the number of programs over the three-year period, although two of these schools either experienced an increase or a decrease in 2009-2010.

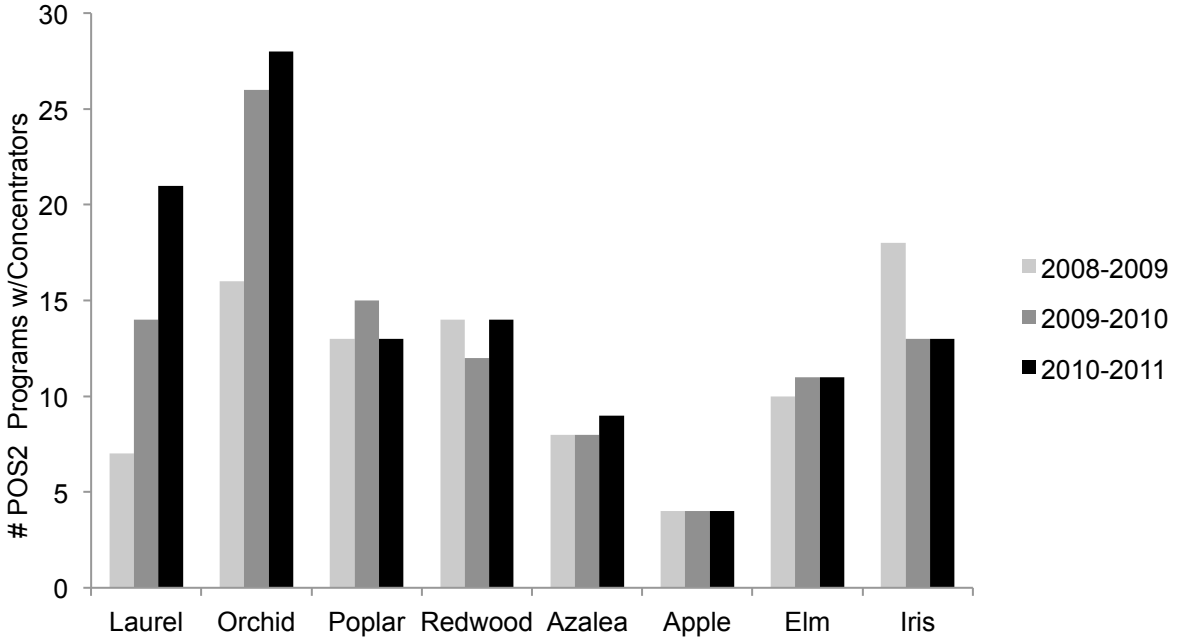

FIGURE 2.1. Number of POS2 majors/programs with possible postsecondary ties with concentrators and completers, 2009-2011.

Again, it is important to remember that the policy was relatively new during these years and majors/programs and career pathways across the curriculum were still being developed for CTE as well as other types of majors/programs. POS2 programs are limited to only those majors/programs that were state-recognized CTE programs. Changes may have been occurring at sample schools in non-CTE programs, such as journalism or performing arts, but these changes would not be identified in this analysis. In addition, during this period, the SDE CATE office was also reorganizing state-recognized programs in several clusters, primarily in Business, Management, and Administration and in Marketing, dropping some courses, adding new ones, and/or renaming programs. Some of the programs in the business cluster were also moved into the Finance Cluster starting in the 2009-2010 school year. Some of the changes at our sample schools reflected this rearrangement at the state level.

As was discussed previously in relation to findings on POS1 students, it was not surprising to find that Laurel had the largest increase in POS2 programs over the study period. Laurel was a relatively new school in which the curriculum was designed around career majors and clusters to meet the requirements of EEDA. Given the school's focus and the short amount of time it had been operating, the steady increase in programs could be expected, as the high school became more established and developed programs to meet the needs of its students.

Iris was the only sample school that had a reduction in the number of POS2 programs between 2009 and 2011. The decrease was relatively large and occurred between the 2008-2009 and 2009-2010 school years, when five out of 18 POS2 programs were no longer offered. There were a number of changes going on at that high school during the study period that may have contributed to this drop. In the second year of the study, due to low test scores, the school was targeted for improvement by the SDE. This meant that the school had to develop a plan and

focus more attention on math and English Language Arts to address low test scores; this resulted in de-emphasizing other areas. At the same time, between the 2008-2009 and 2010-2011 school years, due to budget cuts and lower student enrollment, the school lost 35% of its teachers. But the school's drop in student enrollment was only slightly less than 15%, resulting in higher student-to-teacher ratios across all courses. Teachers were lost across the curriculum, including in CTE, and a number of courses and programs had to be discontinued.

To make more meaningful comparisons across schools, we developed another POS2 variable, the POS2 program ratio. Comparing the number of POS2 programs across schools can be misleading because there was such a range in enrollments across schools, from under 500 to a little over 2,000. A better measure to use for comparison is the ratio of school enrollment to the number of POS2 programs at each sample school during each school year. The lower the ratio, the higher the number of POS2 programs available to students—thus a higher POS2 implementation school.

The range in these ratios across schools is illustrated in Figure 2.2. As can be seen in the figure, there was variation in some of the schools in the ratio over time, with ratios at all but two schools decreasing by the 2010-2011 school year, although the decrease at Azalea was very small. The decrease in ratio means that at these schools, there was a possibility for easier access to POS2 programs for students over the time period. Some of this decrease was due to dropping enrollments in four of the six schools over that period, particularly at Apple and Redwood, where there was no overall POS2 program growth during the period.

In essence, although six of the schools showed improvement in the ratio, only two of the schools, Laurel and Orchid, showed improvement in the ratio of POS2 enrollment to programs that could be linked to increases in the number of POS2 programs. Orchid had a decline in enrollment while at the same time adding POS2 programs, a combination that contributed to the school having the lowest POS2 program ratio by 2010-2011. The school with the most dramatic drop in the POS2 program ratio, Laurel, was the school with staff that reported a high commitment to the EEDA policy and the development of pathways. This school had both an increase in enrollment and an increase in the number of POS2 programs over that period. Even though Laurel increased their number of programs over time, given their higher enrollment, it still showed a high ratio of enrollment to POS2 programs relative to other sample schools, although definitely much reduced by the 2010-2011 school year. Recall that the POS2 program ratio is the ratio of school enrollment to programs, so a lower ratio could be considered to be associated with greater POS2 implementation.

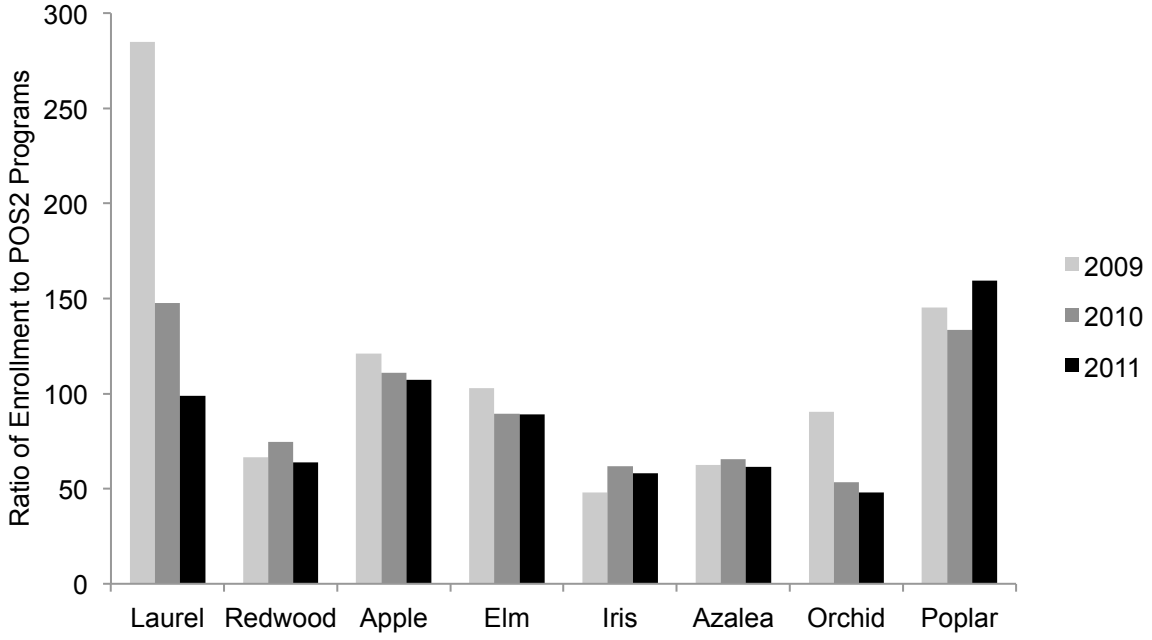

FIGURE 2.2. Ratio of school enrollment to number of POS2 programs (POS2 program ratio), 2009-2011.

At two schools, the POS2 program ratio increased over the three-year period. One of these schools, Poplar, had the highest POS2 program ratio by the 2010-2011 school year. Over that time period, the school had a 10% increase in enrollment, which would impact the ratio. This enrollment increase was not offset by an increase in the number of POS2 programs that year. Although there was a slight increase in POS2 programs in 2009-2010 at that school, the number dropped again in 2010-2011 to the same number of programs available in 2008-2009. Of all of the sample schools, this high school seemed to emphasize four-year college preparation as opposed to expanding CTE program options for students. In fact, it was noted during site visits in 2009 that there seemed to be stigma attached to taking CTE at this school; further, college-bound students were encouraged to take as many Advanced Placement (AP) courses as possible, rather than CTE courses, because few if any of the CTE courses carried AP credit.

To simplify the POS2 program ratio concept for use in quantitative analysis, we decided to use an average of enrollment and POS2 programs over the three-year period to construct a single POS2 program ratio variable. The POS2 program ratio refers to each school's average school enrollment for the three-year period between 2008-2009 and 2010-2011, divided by the average number of POS2 programs with concentrators/completers at each school for those three years. The resulting ratios are shown in Figure 2.3. Across all schools, the average ratio of enrollment to POS2 programs over the three-year period was 93:1, with values ranging from a high of 146:1 at Laurel, down to a low of 55:1 at Iris.

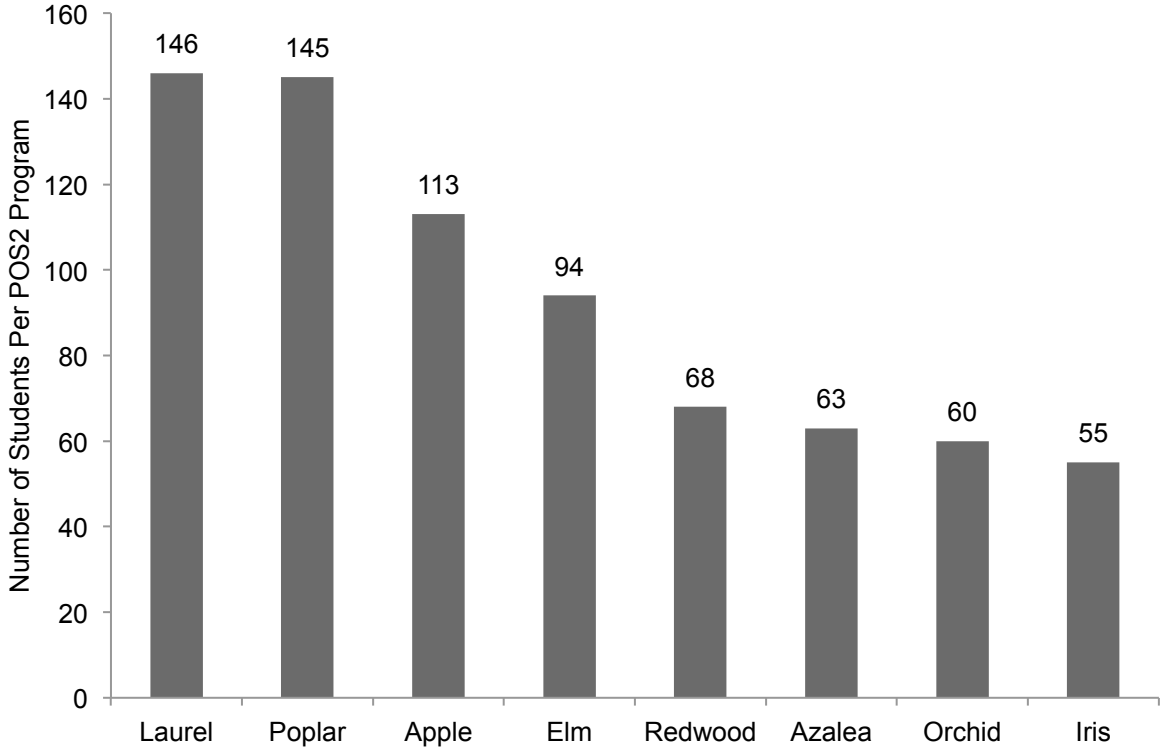

FIGURE 2.3. Average ratio of student enrollment to POS2 programs by school, 2009-2011.

In addition, we also grouped the program ratios into three groups for analyses with some of our constructed variables. We developed the groupings based on the range across schools. As shown in Table 2.4., the highest ratios of 146:1 and 145:1 were categorized as low POS2 program implementation schools (Low). The mid-range ratios of 113:1 and 94:1 were categorized as medium POS2 implementation schools (Medium). The lowest ratios of 68:1 or below were considered as high POS2 implementation schools (High).

The two Low POS2 program implementation schools are Laurel and Poplar. Both schools had the highest average enrollment over the three-year period, which could contribute to the higher enrollment to POS2 program ratios. As discussed above, the Low POS2 implementation level for Poplar seemed to mirror the level of effort found at the school in the area of POS2 program development. However, averaging over three years of data to develop these ratios provides a somewhat misleading view of the efforts underway in POS2 development at Laurel because it masks the dramatic drop in the POS programs ratio over that time from 285:1 down to 99:1. When averaged, the school's higher student enrollment relative to most other schools and increases in numbers of students over the time period offset the addition of new POS2 programs. Without averaging, the school's POS2 implementation level would fall into the medium POS2 implementation range. This school, however, was the only one in which using the average POS2 program ratio did not accurately reflect the three-year trend.

Table 2.4
Three-Year Average Number of POS2 Programs, School Enrollment, Ratio of Students to Programs and POS2 Implementation Groups, 2009 - 2011

School Name	Average Number POS2 Programs 2009-2011	Average Total School Enrollment 2009-2011	Average POS2 Program Ratio 2009-2011	POS2 Program Implementation Level Groups
Laurel	14	2,044	146	Low
Poplar	14	1,988	145	Low
Apple	4	452	113	Medium
Elm	11	997	94	Medium
Orchid	23	1,393	60	High
Redwood	13	907	68	High
Azalea	8	527	63	High
Iris	15	806	55	High
All Schools	12.8	1,139	93	--

Four schools fall into the High POS2 implementation level: Orchid, Redwood, Azalea, and Iris. The school with the lowest average POS2 program ratio was Iris. There was not much change at Redwood over the study period as the school began with a low ratio and maintained about the same ratio across the three school years, with a slight decrease in ratio due to a slight drop in enrollment. Nor were there any large changes at Azalea in terms of the average POS2 program ratio over the time period. However, it appeared that the development of POS2 programs at these schools may have begun prior to our study period, because they started with such low ratios, and the schools were maintaining already established POS2 programs during those school years.

Iris was an interesting case because not only did their enrollment drop, but their number of POS2 programs also dropped. Yet Iris still continued to have a low ratio and therefore a high implementation level of POS2 programs. One explanation for this may be that the school started with a low ratio in 2008-2009.

Orchid was also different from other schools in terms of POS2. This school had a drop in enrollment over the study period but also saw the second largest increase in POS2 programs. This increase in programs seemed to be the result of the convergence of some unique factors at the school. Orchid had a long-term commitment to offering CTE programs on its campus. The structure for career pathways had already been put into place prior to EEDA through implementation of the Southern Regional Education Board's High Schools That Work (HSTW) program. The passage of EEDA only strengthened this orientation. But the real impetus for the increase in their efforts on career pathways and curriculum integration, as reported by staff during interviews, came from the receipt of funding for Smaller Learning Communities. Staff reported that the school redesigned the curriculum around clusters and organized their small learning communities around clusters of related pathways. Each smaller learning community contained relevant content teachers for the clusters, such as for business and marketing, and core academic teachers were assigned to each academy and were co-located for better coordination.

The development of POS2 programs was one outcome of this effort, which was then reportedly strengthened through the policies put in place by EEDA.

POS2 completers. The calculation of POS2 completers comes closest to how the SLDS data were coded for analysis of POS1 students. Based on the definition used by the SDE CATE office, a POS2 completer is a secondary student who has earned *all* of the required units in an identified CATE program, which must include at least four Carnegie units of credit within that program. The distribution of completers across clusters for the 2008-2009 and 2010-2011 school years is outlined in Figure 2.4. In both years across sample schools, there were by far the largest percentages of completers in POS2 programs in the Health Science cluster. Higher percentages of completers between the two school years were also found in the Hospitality & Tourism (primarily in Culinary Arts) and Architecture and Construction (mainly in general building construction) clusters. The largest increase in the percentage of completers was in POS2 programs in the Science, Technology, Engineering, & Mathematics (STEM) cluster, in large part due to the increase in enrollment in Project Lead The Way (PLTW).

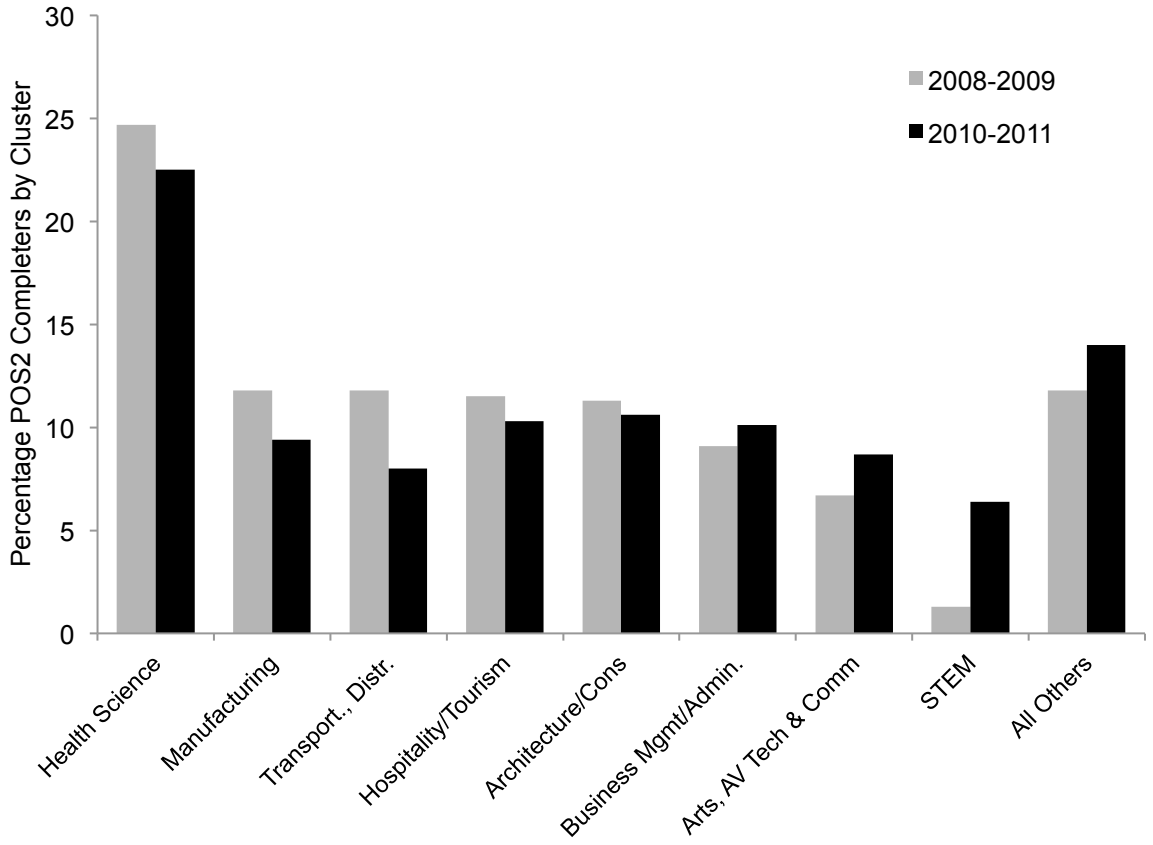

FIGURE 2.4. Percentage of completers by POS2 program cluster by year, 2008-2009 and 2010-2011.

Across sample schools, the average number of POS2 completers increased from 47 to 55, an increase of 17% between the 2008-2009 and 2010-2011 school years. Figure 2.5 shows the trends in number of POS2 completers at each school for each of the school years over the three-

year period. As shown, at five of the eight schools, there was an increase in the number of POS2 program completers. Two of the five schools, Laurel and Poplar, had much higher net increases over the three-year period than the other schools (200.0% and 65.5%, respectively). The other three schools had similar, more moderate, increases that ranged from about 10% to 16% in the number of POS2 completers over the period. Three schools had a decline in number of POS2 completers over the three-year period. The largest decrease occurred at Azalea, with a 46.2% decrease in number of POS2 programs between those school years.

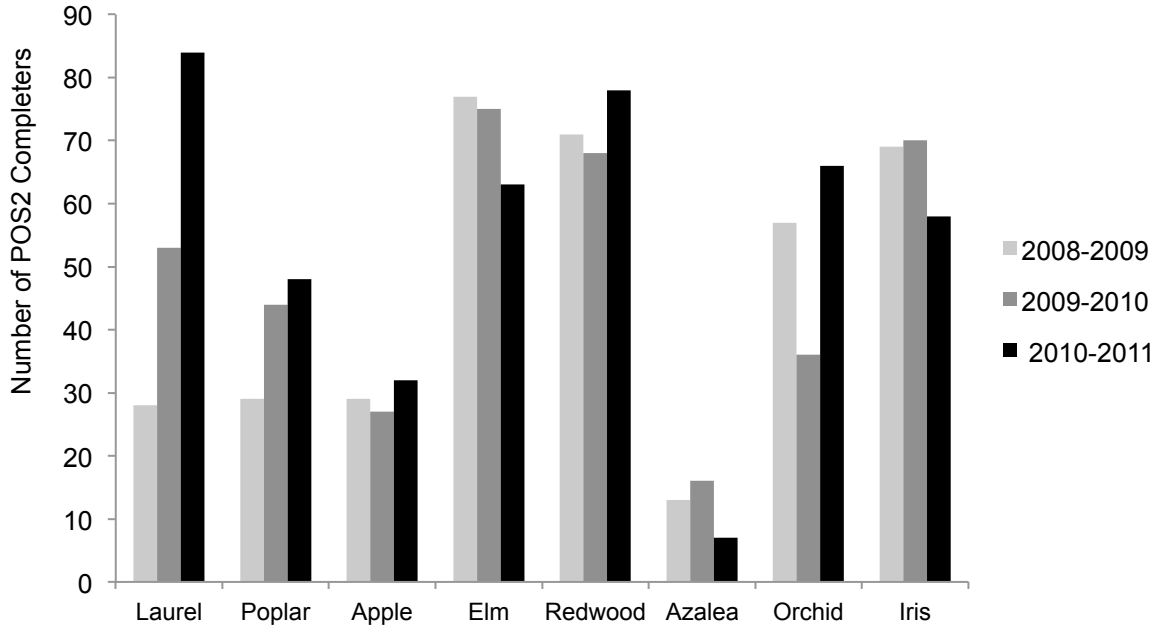

FIGURE 2.5. Number of POS2 completers for all students, 2009-2011.

The school with the most consistent trends across POS2 variables was Laurel. During that three-year period, the number of POS completers increased substantially as did the number of POS2 programs, whereas the ratio between students and POS2 programs declined substantially.

The patterns for other schools, however, were not as consistent across POS2 variables. Among the four schools that were categorized as High POS2 implementation schools, only two of these schools, Orchid and Redwood, had modest increases in the number of POS2 completers over that three-year period. On the other hand, Azalea and Iris both had decreases in the number of POS2 completers, with almost a 50% decrease at Azalea in POS2 completers over the time period. Our earlier discussion of economic challenges and loss of teachers, programs, and courses helps to explain the drop in number of completers for Iris. It was not as clear why the drastic reduction occurred at Azalea. During that period, there was growth in both enrollment and the number of POS2 programs, though only a modest increase in POS2 programs at the school.

Poplar, a school that had the same number of programs in 2010-2011 as in 2008-2009 and an increase in the POS2 program ratio, experienced the second-highest percentage gain in number of POS2 completers. It is possible that knowledge of and interest in POS2 programs increased

due to EEDA and better information dissemination for programs, but further investigation is needed to understand the trends at this school.

POS2 completers as percent of eleventh- and twelfth-grade enrollment. When comparing changes across schools in completer rates, apparent differences may be due to changes in enrollment rather than in the number of students actually completing programs. To take enrollment into consideration, we calculated the percentage that POS2 completers were of the total number of eleventh and twelfth graders at a school for each school year. Only eleventh and twelfth graders were used in the calculation because completion of a POS2 program is not usually possible until at least the eleventh grade. Percent POS2 completers is therefore the total number of reported POS2 completers at any sample school for the year divided by the total eleventh- and twelfth-grade enrollment at the school for that year.

The average percentage of POS2 completers as a percentage of eleventh- and twelfth-grade enrollment across schools was around 12% in both the 2008-2009 and 2010-2011 school years. The highest percentage of POS2 completers by the 2010-2011 school year was 18.8% at Redwood, and the lowest was at Azalea, with 2.6% POS2 program completers.

The trends and amount of change across schools varied, as it did for other POS2 variables, as shown in Figure 2.6. Five of the eight schools had increases in percent POS2 completers, with substantial increases at two schools, Laurel and Poplar. Laurel had a steady increase over the period, and the increase at Poplar occurred between the 2008-2009 and 2009-2010 school years and remained the same through the 2010-2011 school year. One school, Apple, had a moderate increase in percent POS2 completers, whereas for the remaining schools, Orchid and Redwood, the increase was minimal. Percent of POS2 completers declined at the other three sample schools. The most dramatic decrease occurred at Azalea between the 2009-2010 and 2010-2011 school years.

Because we were interested in the difference between two cohorts of students at our schools, the Class of 2009 (pre-policy) and the Class of 2011 (early-policy), percent POS2 completers was estimated for each cohort. These are cohort estimates rather than true cohort percentages, given the way in which the percentages were calculated. Unlike for POS1 students, the calculation of these percentages was based on any students who were reported as completers of POS2 programs in a given year by the SDE CATE office, regardless of their grade level. The cohort estimates were based on an assumption by the study team that the majority of students that completed POS2 programs in either 2009 or 2011 were seniors, and therefore members of the two cohorts, but could include students from younger cohorts as well. Developing these cohort estimates also allowed for some comparison between POS1 students and POS2 completers, which we discuss in a later section of this technical report.

The estimates for the percent POS2 completers from each of the two cohorts are outlined in Table 2.5. At only three of the sample schools did the percentage of POS2 completers increase between the 2009 Cohort and the 2011 Cohort, and these increases were small. Little change was found between the two cohorts at two schools. At the other three sample schools, percent POS2 completers declined between the two cohorts.

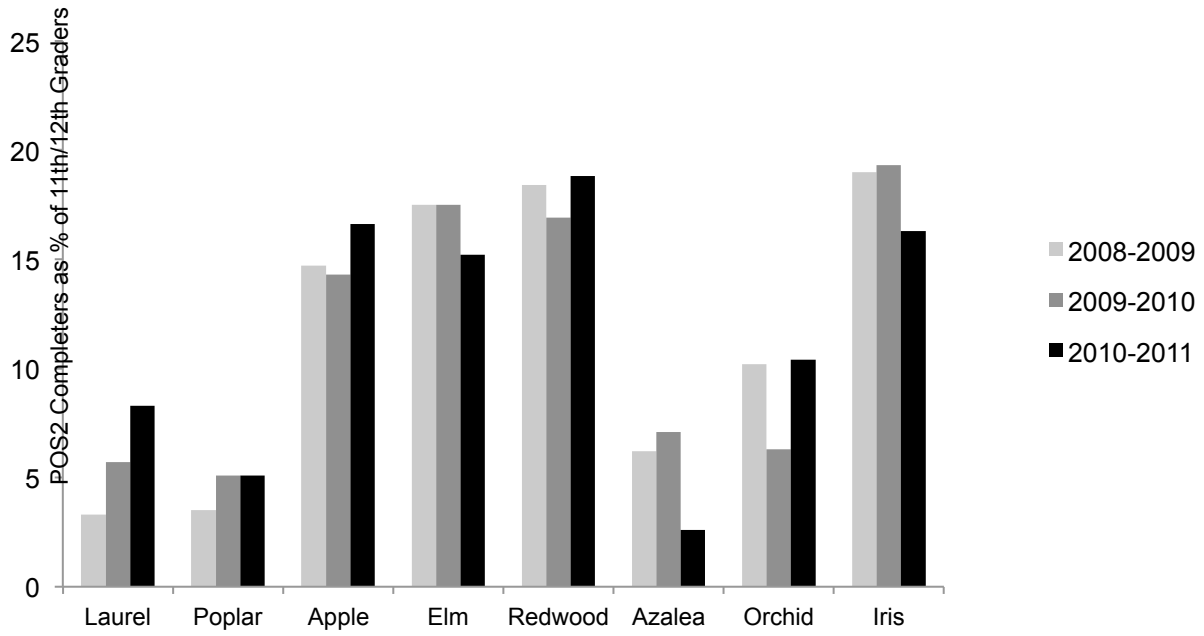

FIGURE 2.6. POS2 completers as percentage of 11th and 12th graders by school, 2009-2011.

Table 2.5
Estimated Percentage POS2 Completers by Cohort[a] by School and POS2 Program Implementation Level

School	2009 Cohort	2011 Cohort	POS2 Change	POS2 Program Implementation Level Groups
Orchid	10.2	10.4	0.2	High
Redwood	18.4	18.8	0.4	High
Azalea	6.2	2.6	-3.6	High
Iris	19.0	16.3	-2.7	High
Apple	14.7	16.6	2.2	Medium
Elm	17.5	15.2	-2.4	Medium
Laurel	3.3	8.3	5.0	Low
Poplar	3.5	5.1	1.6	Low
Total	11.6	11.7	0.1	--

[a] These do not represent true cohort figures such as those for POS1 students. We made an assumption that most of the students completing a POS2 program in 2008-2009 would be seniors and thus members of the Class of 2009. The same assumption was made about the figures for the Class of 2011.

At all four High POS2 program implementation schools, based on the ratio of students to POS2 programs, either there was essentially no change between the cohorts on percent completion or declines in completion. In fact, Azalea had the largest decrease in percent POS2 completers. As was discussed previously, this lack of change or even slight decline in program completers may indicate that programs were already in place prior to EEDA to which both the 2009 cohort and 2011 cohort had access. This could mean that both cohorts at these schools had similar access to

POS2 programs and the courses allowing them to complete them. Orchid, however, had a relatively large increase in the number of programs over that time period, yet there was little change in the number of completers over the three school years. This may indicate a lag in access to programs and courses over the period as new programs were established, which meant that students were not able to complete a program before they graduated. Or, it is also possible that the programs were not adequately promoted to students.

Consistent with other trends described above, Laurel had the largest increase in percent POS2 completers between the two cohorts, although the increase was still relatively small. As shown in Figure 2.7, there was no real relationship between having a low ratio of enrollment to POS2 programs and the percentage of POS2 completers. Increasing the availability of POS2 programs did not necessarily lead to increases in POS2 program completion by students.

Comparisons between POS1 and POS2 data sources. As discussed, POS1 and POS2 are not directly comparable but instead provide alternative measures of POS. We would generally expect the two POS measures to show similar changes over time and thus can examine whether the same trends appear to be occurring in cohorts within and across schools. The percentage of POS1 students completing logical course sequences in a single career cluster were compared to the percentage of POS2 completers, as outlined in Table 2.6. Although there were slight differences between the two data sources and more substantial ones on three schools, no statistically significant differences were found between POS1 and POS2 for the Class of 2009 cohort and no significant differences were found between POS1 and POS2 for the Class of 2011 cohort.

Table 2.6
Percent POS1 Students (Special Formula)[a] and Percent POS2 Completers by Cohort and School

	Percent POS1 Students		Percent POS2 Completers			
School	2009 Cohort	2011 Cohort	2009 Cohort	2011 Cohort	POS1 Change	POS2 Change
Apple	5.8%	24.5%	14.7%	16.6%	18.7%	2.2%
Azalea	7.9%	5.0%	6.2%	2.6%	-2.9%	-3.6%
Elm	22.0%	17.4%	17.5%	15.2%	-4.6%	-2.4%
Iris	33.5%	31.1%	19.0%	16.3%	-2.4%	-2.7%
Laurel	3.0%	9.9%	3.3%	8.3%	6.9%	5.0%
Orchid	13.4%	8.7%	10.2%	10.4%	-4.7%	0.2%
Poplar	1.2%	0.5%	3.5%	5.1%	-0.7%	1.6%
Redwood	20.9%	19.3%	18.4%	18.8%	-1.6%	0.4%

Note: POS1 SDE SLDS Students: POS1 students are students who completed 4 or more credits in a logical progression of courses designated as CTE courses by the Career and Technical Education (CATE) office of the South Carolina State Department of Education (SDE) that were included within a single career cluster. POS2 Completers: A CATE Concentrator who has earned *all* of the required units in a CATE program identified by the assigned CIP Code. A state-recognized CATE program must include 4 or more Carnegie units of credit in CATE courses which lead to a career goal. (SDE CATE DEFINITIONS (Secondary) (Local Plan Instructions, *Career and Technology Education Local Plan,* For Fiscal Year 2009-2010 (FY 10)). Both exclude cosmetology and nail technology programs. [a] Calculation for percent POS1completion for this table differs from that used earlier (Table 2.2). Rather than using tenth-twelfth grade enrollment as the denominator, twelfth-grade enrollment was used as the

denominator to make it more closely approximate the denominator used for POS2 and thus, more comparability between the two measures.

Percentages at three schools resulting from these two data sources were more dissimilar than for the others: Apple, Iris, and Orchid. As described in the section on POS1 findings, the differences between the two data sources at Apple appeared to be an anomaly in the POS1 data. At Iris, the trends in data between POS1 and POS2 were similar; there were a consistently larger percentage of POS1 course progression completers than POS2 program completers. After exploring the number of POS1students (course sequence completers) and POS2 completers (POS2 program completers), the number of student completers identified in each data source were very similar. The difference appeared to be the total enrollment figure used to calculate the percentage, with the POS1 cohort enrollment figure being much smaller than that used for POS2, making the resulting percentage of POS1 completer students higher than for POS2. There appeared to be at least two contributing factors to differences in POS1 and POS2 estimates between the cohorts from the two data sources at Orchid. First, POS1 course sequences did not include cross-cluster programs and there were a number of those at Orchid, particularly for the 2010-2011 school year. Second, the POS1 course sequences also appeared to exclude completers taking courses at the school district career center who were included in the POS2 count.

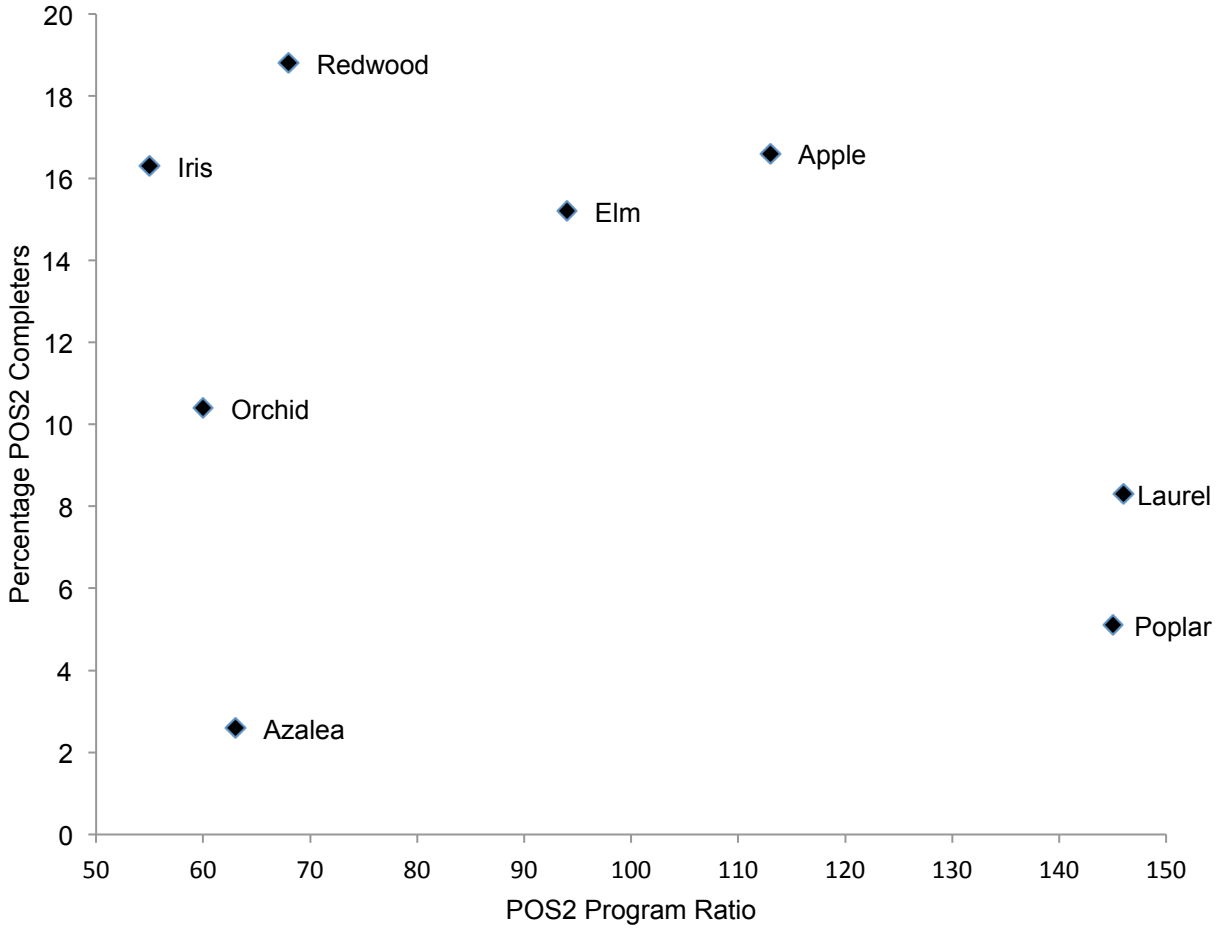

FIGURE 2.7. Percentage POS2 completers by POS2 program ratios.

Overall participation in POS2 programs. In addition to looking at trends in the number of POS2 programs and POS2 program completers, we also wanted to explore trends in overall participation in these types of programs between 2008-2009 and 2010-2011. The SDE CATE office defines three types of participants in state-recognized CTE programs that were described earlier in this section: participants, concentrators, and completers. Unduplicated counts of these groups were collected from the SDE CATE office for each of the three school years and these data were combined to calculate the total number of students enrolled in POS2 programs in each of these years. The total number of participants for a given year was then divided by the school's total enrollment for that year, resulting in the percentage of POS2 participants for each school for each of those three school years.

Overall, the average total enrollment in POS2 programs between 2008-2009 and 2010-2011 was 62.3%, a majority of students. However, there was a decline in participation in these programs at sample schools over the three-year period, from a high of 65.5% of all students participating in a POS2 program in 2008-2009 to 58.2% of all students participating in 2010-2011, an 11.1% decrease in overall POS2 program participation. At all but one school, Poplar, overall CTE enrollment declined over the period. The most substantial decreases came at Azalea (down 32%), followed by Iris (down 26%). These trends were consistent with patterns we described at these schools on other POS2 variables. Although overall enrollment in these programs declined over the period, still at least half of the students enrolled at each sample school had taken at least one POS2 program course over the study period, with an average range from 50.0% of students participating at Poplar to 73.4% of students participating at Iris.

POS2 participation rates relative to overall enrollment varied across schools over the study period, as highlighted in Figure 2.8. Rates at individual schools also fluctuated from year to year. Some of this variation was due to declining enrollment at some of the schools over this period (Orchid, Redwood, Apple, Iris, and Elm), making the relative participation rates vary regardless of growth or decline in number of POS2 programs. From the figure, it appeared that two schools, Iris and Poplar, experienced increases in overall percent POS2 program participation over the study period. Iris, however, as mentioned above, had a decline in POS2 enrollment over that period. Their apparent gain in percentage of POS2 enrollment was due to a larger decline in overall enrollment (down 12.5%) than in POS2 enrollment (down 5.6%) between those years.

There was an increase in participation in POS2 programs at Poplar over the study period. Poplar, which had the lowest participation rate in 2008-2009, experienced a net gain of approximately 13% in POS2 enrollment over the three-year period. But Poplar still had the lowest overall average percentage of POS2 participants of any school over the study period, with 50% of their student body taking at least one POS2 program course.

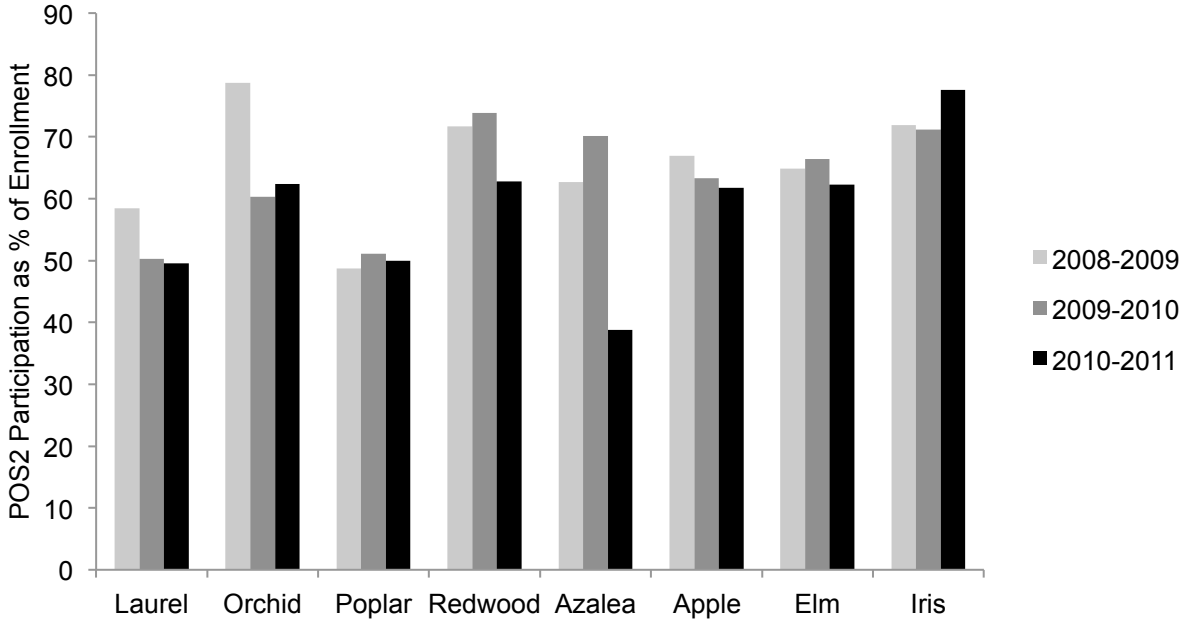

FIGURE 2.8. Total participation in POS2 programs as percentage of school enrollment by school by year, 2009-2011.

The two schools with the greatest drop in percentage of POS2 program participation were Azalea and Orchid. The decline in percentage participation in POS2 programs at Azalea mirrored trends found in other POS2 variables. Orchid, on the other hand, saw increases in some aspects of POS2 program participation and implementation and declines in other areas. Even with the decrease in enrollment in these programs, however, Orchid still had the third highest average percentage of students participating in POS2 programs, 67.4%. This was partially due to the fact that they started with the highest percentage of students participating during the 2008-2009 school year, with almost 80% of the student body taking at least one course in a POS that year.

These trends contradict reports of students and staff during site visits; there was a perception at a number of schools that not only had awareness of CTE increased, but also that CTE course-taking by students had changed and/or increased during the study period. At least half of students were taking at least one POS2 program course by the 2010-2011 school year. However, the numbers of students participating steadily declined or stayed the same during that period at all but one school.

It may be the case that some teachers *were* seeing more students in their classes, even if overall enrollment wasn't increasing—that is, if IGPs were in fact channeling students to more, and perhaps more diverse, POS2 courses. In addition, teachers at a number of schools reported more appropriate placement of students in their and other POS2 courses/programs—that may have influenced their perception of an increase in participation rates. Students may have been more aware of CTE courses as options and assumed that there was more participation or changes in the types of students participating—such assumptions may have changed their perceptions of the amount of participation in POS2 programs.

POS3 Student-Level Variable

To allow for a slightly different angle on POS participation, an additional variable, POS3, was created from responses to the *Student Engagement/POS Experiences Survey*. Students were asked on the survey about how often they had taken CTE courses (such as culinary arts, cosmetology, construction, graphic communication, or health science courses) during high school. Students were grouped into two categories: students who self-reported that they had taken three or more CTE courses were categorized as *CTE students* and students who self-reported that they had taken none or one or two CTE courses during high school were categorized as *non-CTE students*.

It is important to note before reviewing the resulting groupings that these CTE and non-CTE groupings developed for POS3 analyses cannot be directly compared to those of completers from either POS1 and POS2 due to the very different nature and sources of these data. POS1 data are archival data from the SDE SLDS and POS2 data are archival data from the SDE CATE office. POS3 data are from surveys administered to students in the two target cohorts that were administered to as many of the students in the cohort in the appropriate grade level as possible—they do not represent random samples of the cohort. The POS 3 variable was created primarily for analysis of the student survey data.

As shown in Table 2.7, overall, the distributions of responses for seniors in the Class of 2009 and seniors in the Class of 2011 are not significantly different, with approximately 30% of students reporting taking a CTE course three or more times by the end of their senior year (the time of survey administration).

Table 2.7
Student Reports of the Number of Times They Took CTE Courses While in High School

Percentage of respondents	Senior Class of 2009 % (*N*)	Senior Class of 2011 % (*N*)
Non-CTE (Never, 1-2 Times)	71.16 (708)	70.38 (644)
CTE (3 or More Times)	28.84 (287)	29.62 (271)
Total	100.00 (995)	100.00 (915)

Note. Source: *Student Engagement/POS Experiences Survey*, from administrations with cohorts in the spring of their senior year. The data does not include multiple responses, missing responses, or not applicable responses.

Table 2.8 shows the differences in percentages of students who self-reported taking three or more CTE courses by the end of high school by cohort and school. These differences generally mirrored the trends we found in these schools on various POS2 variables. Azalea had a large decrease in the number of POS2 program completers and Laurel had a large increase in the number of POS2 program completers between the time the 2009 cohort took the survey as seniors and the time when the 2011 cohort took the survey as seniors. Three schools had trends in survey reports counter to those in the school archival data, but it was difficult to discern the reason for these differences. One reason may be that seniors are often difficult to reach at the end of the school year, when the surveys were administered. At Redwood and Azalea, students taking CTE courses would have been off-campus at the career center and would not have been administered the survey there. Some students may have been completing internships and been

mainly off-campus or might have already completed academic core course requirements and thus were not in the classes that were surveyed.

Table 2.8
Percentage POS3 Students of Class of 2009 and Class of 2011 Surveyed as Seniors by School

School Name	Percent POS3 Class of 2009	Percent POS3 Class of 2011	POS3 Difference in Percent 2009-2011
Elm	38.0	36.9	-1.1
Poplar	21.0	24.3	3.3
Azalea	29.7	14.5	-15.2
Iris	20.8	25.4	4.6
Laurel	18.6	30.5	11.9
Apple	40.2	39.4	-0.8
Orchid	27.3	28.2	0.9
Redwood	41.8	36.2	-5.6
Total	29.7	29.4	-0.3

Study-Defined Perkins IV POS (POS4)

As we have discussed, we faced challenges applying the Perkins IV core elements to the career majors and CTE programs in our sample schools. One challenge was that EEDA encompasses more than just CTE courses and programs and we needed to develop measures that could be applied across the entire high school curriculum. Another was that the elements of Perkins IV POS, as outlined in the law and supporting implementation materials provided by OVAE, were not sufficiently well-defined to allow for easy translation into direct measures for each element.

To address these challenges, we decided to operationalize the Perkins IV core elements for the purposes of the study and construct a study-defined variable for Perkins IV POS (POS4). To develop more specific criteria and guidelines for POS4, we reviewed a number of sources (see Technical Appendix B, Study Design section). Based on these reviews, we developed criteria for each of the four core elements to use in the examination of each sample school's career majors/programs to determine if they met these criteria. We restricted our review to only those career majors that were considered to be state-recognized CTE majors. Next, based on the study-developed criteria, we examined these state-recognized CTE majors to discern which of these met the set criteria.

To conduct these reviews, we drew upon various data sources including information gleaned from on-site interviews and focus groups conducted during the two site visits with guidance personnel, teachers, principals, and assistant principals; content analyses of school archival and web materials on available courses, majors, and career clusters, and on career development and planning; analyses of school responses to a Clusters & Majors checklist; and information compiled from an SDE CATE annual report.

Our original intention was to analyze elements of these CTE majors related to the study-developed criteria at two points in the study: once at the beginning of the study, using data from the 2008-2009 school year and the Fall of 2009 and then again during the final study year, 2011-

2012. However, we were unable to collect adequate comparable data for this variable for the 2010-2011 school year. Therefore, the findings presented here are only from the early years of the study, but do reflect majors available to our primary cohort, the Class of 2011, during their tenth- and eleventh-grade years.

As shown in Table 2.9, a total of 175 CTE majors/programs were identified as being available at sample schools during the 2008-2009 school year, with an average of about 22 CTE majors/programs identified per school. There was a range across schools in the number of total CTE majors/programs identified during that school year. Apple had the lowest number of identified programs, with 12 CTE majors/programs during that school year, whereas the highest number were identified at Orchid, which had 44 CTE majors/programs.

Table 2.9
Number of CTE School Majors/Programs Identified and Number and Percent Reviewed, 2008-2009

School	Total CTE Majors/Programs	Total Eligible/Reviewed CTE Majors/Programs	Percent CTE Majors/Programs Eligible for Review
Orchid	44	22	50.0
Poplar	24	11	45.8
Laurel	22	11	50.0
Iris	22	18	81.8
Redwood	18	13	72.2
Elm	17	9	52.9
Azalea	16	14	87.5
Apple	12	8	66.7
Total	175	106	60.6

Of the total programs, 106 (60.6%) met the criteria to be eligible to be reviewed for evidence that they met the criteria for a POS4, with a wide range in number eligible across schools. At all but one school, at least 50% or more of the programs were found to be eligible for further review. Poplar, which had the lowest percentage considered eligible for further review, had 45.8% of its CTE majors/programs identified as eligible for further review. The two schools with the highest percentage found eligible for review were Azalea (87.5%) and Iris (81.8%). One eligibility criterion that eliminated a number of majors/programs was the requirement that the major/program be treated as a major/program by the school and be advertised in some school materials available to students, so that students would be aware of its availability.

Using the study-developed criteria for the four core Perkins IV elements to review eligible programs, of the 106 CTE majors/programs found to be eligible for review, only nine (11.8%) met the criteria for all four elements to be considered POS4 majors/programs. And, as shown in Table 2.10, these POS4 were found at only two (25%) of the eight sample schools, Redwood and Iris. Six POS4 were identified at Redwood out of the 13 eligible CTE majors/programs—46.2% of all eligible CTE majors/programs and one-third of all identified CTE majors/programs offered at that school for the 2008-2009 school year. All of these POS4 were offered at the school's career center partner. There were three POS4 identified at Iris, representing 17% of eligible CTE

majors/programs and 14% of all CTE majors/programs offered at that school for the 2008-2009 school year. All of these POS4 were offered in partnership between the school and the local community college; courses were offered to students on either the high school or community college campus using the same community college faculty. At both schools, more POS4 programs were found in the Manufacturing cluster than any other career cluster. The other career clusters in which POS4 were identified were Arts, AV Technology, & Communications, Hospitality & Tourism, and Transportation, Distribution, & Logistics. Interestingly, three of the majors/programs identified at these two schools were the same majors/programs—Machine Technology, Welding Technology, and Automotive Technology—and were primarily in the Manufacturing cluster.

Table 2.11 summarizes the findings across schools on each of the four core elements and how many of the eligible CTE major/programs at each sample school met our POS4 criteria for each element. The element for which schools met the least number of study-developed criteria was Element 2. To be considered to have met this element, a CTE major/program had to meet all three criteria developed for that element. None of the CTE majors/programs at five of the schools met all three criteria. For one criterion, having all core and major courses be considered "college prep," none of the CTE majors/programs at half of the schools met this criterion. This criterion was generally an "all or nothing" proposition, because all schools offered the same list of core academic courses for each of the majors/programs. All four of these schools were still offering some below college prep-level courses to students and included these courses on each major's IGP as courses that could be taken to meet graduation requirements. It was decided that if only one of the core academic courses listed in the IGP lists for majors was a non-college prep course, then all courses were not considered college prep for the school's majors/programs—therefore, none of the school's majors/programs met this criterion.

Table 2.10
CTE School Majors/Programs that Met the Four Core Perkins IV Elements, Based on Study-Defined Criteria

School	2008-2009 POS4	Career Cluster	Location of Program
Redwood	Graphic Communications	Arts, AV Technology & Communications	CC
	Culinary Arts	Hospitality & Tourism	CC
	Core Electronics	Manufacturing	CC
	Machine Technology	Manufacturing	CC
	Welding Technology	Manufacturing	CC
	Automotive Technology	Transportation, Distribution & Logistics	CC
Iris	Machine Technology	Manufacturing	HS[a]
	Welding Technology	Manufacturing	HS[a]
	Automotive Technology	Transportation, Distribution & Logistics	HS[a]

Note. CC = career center; HS = high school. [a] Available in partnership with local community college on both the high school and community college campus.

Table 2.11

Number of CTE Majors/Programs that Met Requirements for Perkins IV POS (POS4), 2008-2009

	CTE Majors/Programs		Element 1	Element 2				Element 3	Element 4				TOTAL
Sample School			**Incorporate and align secondary and postsecondary**	**Include academic and CTE content in coordinated, non-duplicative progression of courses elements**				**Include dual credit or concurrent enrollment or other options to receive college credit**	**Leads to credential after postsecondary training/education or leads to 2- or 4-year degree**				**Number Study-Defined Perkins-IV POS**
	Total 2008-2009 CTE Majors/ Programs[a]	**Total Eligible/ Reviewed 2008-2009 CTE Majors/ Programs[b]**	**Has an active/current major-specific written articulation agreement spelling out alignment OR Offers at least one dual credit/enroll or TAP course in major**	**Coordinated progression of courses: at least 4 course sequence to complete major**	**All core and major-required courses are "college prep"**	**Major-specific required courses aligned with industry standards**	**Met all 3?**	**At least one dual credit/enroll or TAP course offered in major OR AP courses if listed under required courses for major**	**Results in industry-recognized or sponsored credential -- at post-secondary level**	**Results in 2-year degree**	**Results in 4-year degree**	**Met at least one?**	
Laurel	22	11	3	0	11	5	0	3	0	4	2	4	0
Orchid	44	22	5	4	22	12	4	4	2	10	10	10	0
Poplar	24	11	6	6	0	8	0	4	2	3	3	3	0
Redwood	18	13	9	10	13	13	10	9	2	11	7	11	6
Azalea	16	14	10	2	0	11	0	10	1	8	4	8	0
Apple	12	8	5	1	0	5	0	5	1	4	3	5	0
Elm	17	9	5	4	0	5	0	5	2	7	5	7	0
Iris	22	18	7	10	18	13	8	7	1	11	3	11	3
Total #	175	106	50	37	64	72	22	47	11	58	37	59	9
Avg. #	21.9	13.3	6.3	4.6	8.0	9.0	2.8	5.9	1.4	7.3	4.6	7.4	--

[a] Total includes the majors/programs reported in the school catalog's 2008-2009 catalog or registration materials that were reported as eligible for CTE funding in South Carolina by the state CTE office, programs with enrollment that matched a South Carolina CTE program CIP Code, and/or programs that the South Carolina CTE office reported had concentrators in that program at that school for the 2008-2009 school year. [b] Based on meeting one of 5 options and 1 additional requirement.

As such, all of the CTE majors/programs at those schools did not meet that criterion. A high percentage of CTE majors/programs also did not meet the first criterion for Element 2, the inclusion of a coordinated progressive sequence of at least four courses required to complete that major/program.

Table 2.12 shows the number and percentages of eligible CTE majors/programs across sample schools that met various criteria. On average, a little less than one third (29.3%) of the eligible CTE majors/programs met criteria for three of the four elements. At only two schools, Azalea and Apple, did at least half of the eligible CTE majors/programs meet criteria for three of the four elements. For the other schools, percentages ranged from 13.6% at Orchid to 44.4% at Elm.

Although on average, almost half (47.2%) of the eligible CTE majors/programs either included at least one dual credit option or had some type of articulation agreement for postsecondary training or college credit, the percentages across schools varied widely. Around 70% of majors/programs at Azalea and Redwood offered some type of college credit or postsecondary training option. Percentages at the other schools ranged from a low at Orchid of 22.7% to 62.5% at Apple.

A little over half of the eligible CTE majors/programs across schools were reported to lead to some type of postsecondary training or education or a two- or four-year degree. Again, there was a great degree of variation across sample schools. At Poplar, only a little over one fourth (27.2%) of eligible CTE majors/programs were reported to lead to postsecondary education, training, or degrees, whereas at Redwood, the vast majority (84.6%) of eligible CTE majors/programs reportedly led to postsecondary options. In addition to Poplar, two other schools had fewer than half of their eligible CTE major/programs lead to postsecondary options. At the other schools, at least half of the eligible CTE majors/programs were reported to lead to postsecondary options.

Not surprisingly, Redwood, which had six POS4s, had the highest or close to the highest percentages of eligible CTE majors/programs that had dual credit options, majors/programs that were reported to lead toward postsecondary options, and majors/programs with coordinated sequences of courses. At Iris, on the other hand, the other school with POS4s, eligible CTE majors/programs did not consistently have many of the elements. Other schools had majors/programs that were high on some elements but low on others. For example, Azalea had the highest percentage of eligible CTE majors/programs with dual credit options but one of the lowest percentages of majors/programs with coordinated sequences of courses. Apple had relatively large percentages of eligible CTE majors/programs with dual credit options and majors/programs that were reported to lead to postsecondary education/training/degrees but had one of the lowest percentages of eligible CTE majors/programs with coordinated sequences of courses.

Table 2.12

Number of Eligible CTE School Majors/Programs That Met Some of the POS4 Elements, 2008-2009

School	Number Eligible/Reviewed CTE Majors/Programs *N*	Number of Perkins IV POS *N*	Number of Eligible CTE Majors/Programs Meeting 3 of 4 Elements *N* (%)	Percent Eligible CTE Majors/Programs with Dual Credit Options and/or Some Type of Articulation Agreement *N* (%)	Percent Eligible CTE Majors/Programs with Coordinated Sequences of Courses *N* (%)	Percent Eligible CTE Majors/Programs Leading to Post-Sec Training/Education/ Degree *N* (%)
Laurel	11	0	2 (18.2)	3 (27.3)	0 (0)	4 (36.4)
Orchid	22	0	3 (13.6)	5 (22.7)	4 (18.2)	10 (45.5)
Poplar	11	0	2 (18.2)	6 (54.5)	6 (54.6)	3 (27.3)
Redwood	13	6	4 (30.8)	9 (69.2)	10 (76.9)	11 (84.6)
Azalea	14	0	8 (57.1)	10 (71.4)	2 (14.3)	8 (57.1)
Apple	8	0	4 (50.0)	5 (62.5)	1 (12.5)	5 (62.5)
Elm	9	0	4 (44.4)	5 (55.6)	4 (44.4)	7 (77.8)
Iris	18	3	4 (22.2)	7 (39.0)	10 (55.6)	11 (61.1)
Total	106	9	31 (29.3)	50 (47.2)	37 (34.9)	59 (55.7)

Table 2.13 illustrates the relationship between policy level of implementation (LOI) groups and POS4. As outlined, there was some relationship between LOI and the number of POS4s identified at schools and the percentage of eligible CTE majors/programs that met the study-defined criteria for at least three of the four elements of POS4, as operationalized by the study team. The school found to have the highest number of POS4s, Redwood, was a high LOI school, whereas the other school with POS4s was a medium LOI school. The two schools with 50% or more of their eligible CTE majors/programs that met criteria for at least three of the four elements of POS4, Azalea and Apple, were medium LOI schools. The other high LOI school, Orchid, however, had the lowest percentage of eligible CTE majors/programs that met criteria for at least three of the four elements of POS4. And one school Elm, a low LOI school, had a higher percentage of eligible CTE majors/programs that met criteria for at least three of the four elements of POS4 than several of the medium LOI schools.

Table 2.13
Number of Eligible CTE School Majors/Programs That Met POS4 Elements by LOI and POV, 2008-2009

School	Number Eligible/ Reviewed CTE Majors/ Programs *N*	Number of POS4 *N*	Percentage of Eligible CTE Majors/Programs Meeting 3 of 4 POS4 Elements (%)	LOI Level	POV Level
Redwood	13	6	30.8	High	Medium
Iris	18	3	22.2	Medium	High
Azalea	14	0	57.1	Medium	Medium
Apple	8	0	50.0	Medium	High
Elm	9	0	44.4	Low	High
Laurel	11	0	18.2	Medium	Low
Poplar	11	0	18.2	Low	Low
Orchid	22	0	13.6	High	Medium
Total	106	9	29.3		

The relationship between the level of community economic resources (POV) groups and POS4 is also shown in Table 2.13. There was a stronger relationship between POV and the number of POS4s identified at schools and the percentage of eligible CTE majors/programs that met the study-defined criteria for at least three of the four elements of POS4, as operationalized by the study team. The two schools found to have POS4s were a medium and a high POV school. In addition, the schools with higher levels of poverty tended to have higher percentages of their eligible CTE majors/programs meet the criteria for at least three of the four elements of POS4. On the other hand, two schools with some of the lowest percentages of their eligible CTE majors/programs that met the criteria for at least three of the four elements of POS4, Laurel and Poplar, were low POV schools.

District- and School-Identified CATE Perkins IV POS (POS5 and P0S6)

We did not assume that the district-identified CATE Perkins IV POS used by districts to receive Perkins funding for the 2008-2009 school year would necessarily be one of the career majors/programs in our schools for that school year; thus we developed criteria to examine their presence. As outlined in Table 2.14, at only two of the schools was the district POS determined as meeting all of the criteria to be considered a POS5.

Table 2.14
2008-2009 District-Identified CATE Programs for Perkins IV Funding Purposes Meeting Requirements for District Perkins IV POS

School	District-Identified CATE Perkins IV Major/Program	Met All Requirements for POS5
Laurel	Project Lead The Way	No
Orchid	Project Lead The Way	No
Poplar	Project Lead The Way	No
Redwood	Health Science Technology	No
Azalea	Health Science Technology	Yes
Apple	Health Science programs (no specific major/ POS identified)	No
Elm	Health Science programs (no specific major/ POS identified)	No
Iris	Auto Mechanics	Yes

Another way we attempted to identify Perkins IV-type POS was to ask school staff during the Fall of 2009 school site visits which of their career majors/programs had the best secondary-postsecondary linkages at the time of our visit. School responses appear below in Table 2.15.

In all but one of the schools, Health Science was identified as having strong ties to postsecondary training and/or two- or four-year degree programs. These programs also usually included opportunities for students to work toward certifications in First Aid, CPR, and/or as Certified Nurse Aides while in high school and take courses to prepare students to take the Pharmacy Technician exam after graduation. Three schools identified their culinary arts program and three of their business programs, particularly accounting, as having the best links with postsecondary. PLTW was mentioned by the three schools whose districts identified this program as their Perkins IV-type POS for funding purposes. These are also the most college-prep oriented schools in our sample. Seven of the eight sample schools identified the district's Perkins IV-type POS used for funding purposes as one of their majors with the strongest secondary-postsecondary ties. Programs identified at only two of the schools met the study-defined criteria for POS4. And, not all of the POS4 majors/programs identified at these two schools were reported by school staff as having strong secondary-postsecondary links. At Iris, the district program was not mentioned as having strong secondary-postsecondary links by school staff, but the program did meet the requirements to be both a POS5 and a POS4.

Table 2.15
Majors/Programs That Schools/Career Centers Reported Having Strongest Secondary-Postsecondary Links for 2008-2009 School Year (POS6)

School	School-Reported Strong Secondary-Postsecondary Links (POS6)	District-Identified Perkins IV Major/Program for Funding Purposes	Met Requirements for POS5	Met Requirements for POS4
Laurel	Health Sciences			No
	Culinary Arts			No
	Project Lead the Way (PLTW)	PLTW	No	No
Orchid	Health Sciences, particularly CNA program			No
	PLTW	PLTW	No	No
	Business, particularly Accounting			No
Poplar	Health Sciences			No
	Engineering Design & Technology (PLTW)	PLTW	No	No
	Visual Arts & Design			No
Redwood & Arbor Career Center	Health Science	Health Science Technology	No	No
	Culinary Arts			Yes
Azalea & Woodland Career Center	Health Science	Health Science Technology	Yes	No
	Horticulture			No
Apple	Culinary Arts – most emphasized			No
	Building Construction – most emphasized			No
	Health Science	Health Science Programs	No	No
	Horticulture			No
Elm	Health Science	Health Science Programs	No	No
	Business, Accounting & Marketing			No
Iris	Accounting			No
	Administrative Support Services			No
	Machine Tool			Yes
	Welding			Yes

	Auto Mechanics	Yes	Yes

Relationships between LOI and POS1 and POS2

In this section, we explore the question of whether EEDA may be helping to facilitate the development of Perkins IV-defined POS by examining the relationship between sample school LOI scores and our various measures of POS, including POS1 and POS2. As described earlier, these measures are drawn from three different data sources and approach POS from several different angles.

LOI and percentage of students completing a POS1 course sequence. Analysis of the percentage of 2011 SLDS cohort POS1 students and a school's level of policy implementation uncovered a small positive association between the two. Higher implementation levels were often associated with higher percentages of POS1 students, but the trend was not consistent across all schools. This inconsistency is illustrated in Figure 2.9, in which high percentages of identified POS1 students are shown to be in Low LOI (policy implementation) (60-69), Medium LOI (70-79), and High LOI (80-89) sample schools. There was also a school in the high LOI group with a lower percentage of POS1 students than several of the Medium LOI schools.

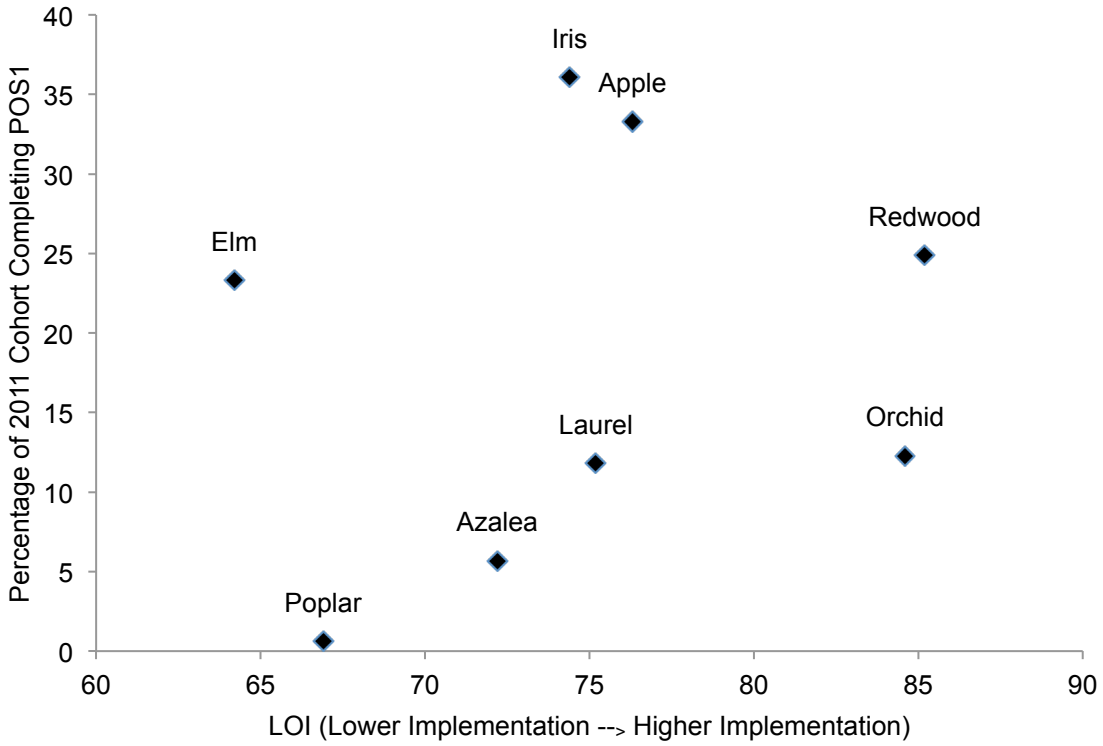

FIGURE 2.9. Percentage of SLDS cohort 2011 completing POS1 by LOI.

LOI may not have had anything to do with overall percentage of students completing POS1 course sequences because the schools started at very different points prior to EEDA. We might expect the change in the percentage of POS1 students from the 2009 (pre-policy) to 2011 (early-policy) cohorts to be more closely related to policy implementation. Table 2.16 presents the

change in the percentage of POS1 students between the two cohorts, ordered from the school with the highest level of policy implementation to the school with the lowest level. Interestingly, only two of the schools had increases in the percentages of POS1 students, although we might have expected to see most or all of the schools see increases in percentages of POS1 students. Both of the schools with increases in percentages of POS1 students fall in the top half of Medium policy implementation scores. This suggests some association between higher EEDA policy implementation and increases in the proportion of students completing POS1 course sequences.

Table 2.16
Percentages of POS1 Students by Cohort by Implementation Level and Differences in Percentages

School	2009 Cohort (%)	2011 Cohort (%)	Difference	EEDA Implementation
Redwood	27.2	24.9	-2.4	High
Orchid	17.8	12.3	-5.4	High
Apple	8.2	33.3	25.1**	Medium
Laurel	4.0	11.8	7.8**	Medium
Iris	38.6	36.1	-2.4	Medium
Azalea	9.4	5.7	-3.7	Medium
Poplar	1.6	0.6	-1.0	Low
Elm	29.5	23.3	-6.2	Low
Total	15.0	15.1	0.1	

Note. Caution should be used in interpreting data from Azalea and Poplar because the number of POS1 students at each of these schools is less than 10. ** $p < .01$.

LOI and the number of students who completed a POS2 program and the number of POS2 programs. As described earlier, data for the POS2 variables are from the SDE's CTE office and represent data on state-certified CTE programs and enrollment in those programs over the study period. Unlike for POS1 students, the number of completers is not based on specific cohorts but includes any student at a sample school that is considered by the state to be a concentrator, completer or participant in a state-approved CTE program in a given school year. Students could be in any grade, but are most likely juniors and seniors during each school year.

Similar to the relationship between POS1 students and LOI, there was a slightly positive association between the level of policy implementation and the percentage of POS2 completers at sample schools. As shown in Figure 2.10, overall, as the level of policy implementation at a school increased, the percentage of POS2 completers also tended to increase. However, there were at least two schools that had either much lower or much higher percentages of completers than expected; Azalea had a much lower than expected percentage of POS2 students, whereas Elm had a much higher than expected percentage of POS2 students. Finally, the two High LOI schools did experience an increase in percentage of POS2 students between the 2009 and 2011 school years, but the increase was only slight. Patterns at the Medium and Low implementation schools were not consistent.

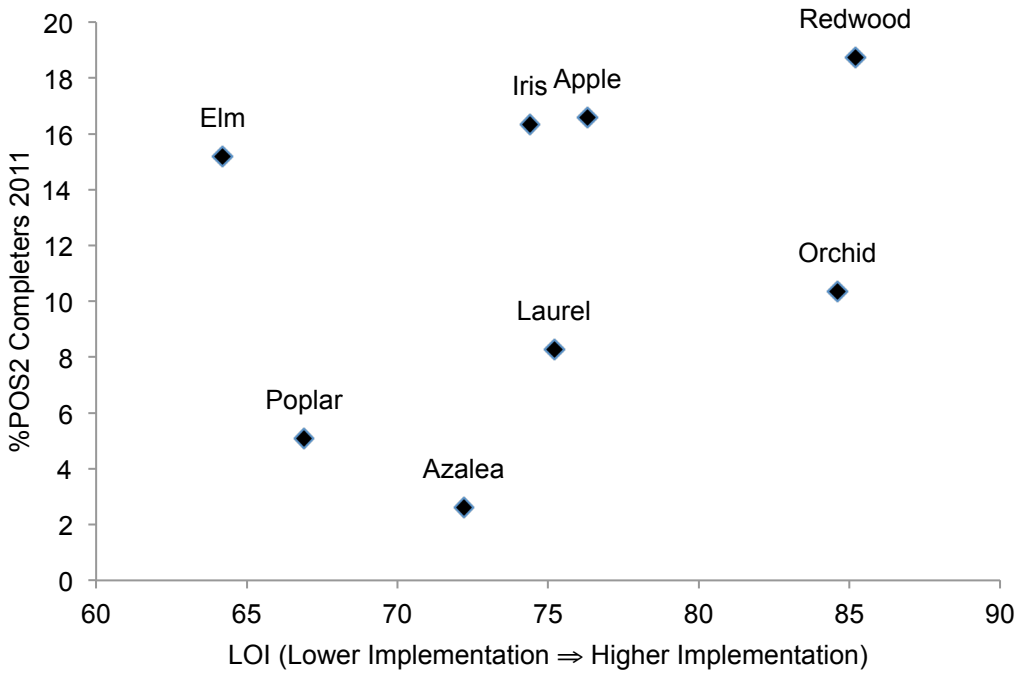

FIGURE 2.10. Percentages of POS2 completers in 2010-2011 by school and LOI.

Table 2.17 shows the changes in percent of POS2 completers (comparing the 2008-2009 school year with the 2010-2011 school year) by implementation level. As noted, there did not seem to be a pattern in the relationship between level of implementation and changes in the percentage of students who completed POS2 programs. In general, at High implementation schools, there were very small increases in the number of students who completed POS2 programs. For the four Medium LOI schools, two experienced slight increases (5.0% and 2.2%), and two experienced decreases of almost the same size. Similarly, for both the Low LOI schools, one experienced a slight decrease (2.4%) whereas the other experienced a slight increase (1.6%) in the percentage of POS2 completers.

To assist with comparisons in number of programs across schools, we calculated a ratio of a schools' total average enrollment between 2008-2009 and 2010-2011 to the average number of POS2 programs available at a school between those school years (POS2 program ratio). The lower the ratio of enrollment to POS2 programs at a school, the higher the number of programs relative to enrollment and thus, we assumed for the purposes of this study, the higher the implementation of CTE programs at that school.

There was a slightly negative association between LOI and POS2 program ratios, where, in general, the higher the level of LOI, the lower the number of students to POS2 programs, although there was a high degree of variation among Medium and Low policy implementation schools.

As shown in Figure 2.11, a slight negative association was found between level of policy implementation (LOI) and the POS2 program ratio. In general, the higher the LOI, the lower the number of students to POS2 programs. Where there were lower numbers of students per POS2

programs (lower POS2 program ratios), such as at Iris, we considered this as an indication of a generally higher level of POS2 program implementation at the school, and the potential for better availability of POS2 programs for students. All of the schools generally followed this trend, although there was a high degree of variation among Medium and Low policy implementation schools. Laurel, in particular, did not follow the general pattern because it had the highest POS2 program ratio, indicating a low student to program ratio, even though it was a Medium policy implementation school.

Table 2.17
Changes in Percentage POS2 Students by Cohort, Ordered by EEDA Policy Implementation Level (LOI)

School	2009 Cohort (%)	2011 Cohort (%)	Percent Difference	EEDA Implementation (LOI)
Redwood	18.4	18.8	0.4	High
Orchid	10.2	10.4	0.2	High
Apple	14.7	16.6	2.2	Medium
Laurel	3.3	8.3	5.0	Medium
Iris	19.0	16.3	-2.7	Medium
Azalea	6.2	2.6	-3.6	Medium
Poplar	3.5	5.1	1.6	Low
Elm	17.5	15.2	-2.4	Low

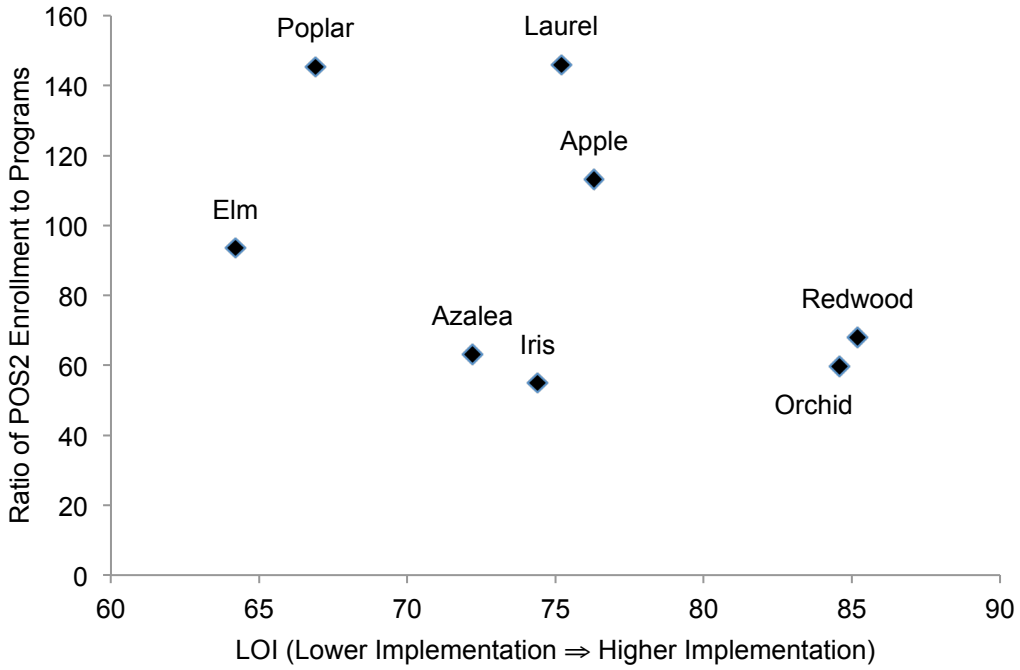

FIGURE 2.11. Ratios of school enrollment to number of POS2 programs, 2009-2011 averages, by school and LOI.

Relationships between specific LOI facets and POS variables. Information gathered through our interviews about the development and maintenance of POS suggested that, even though the association between total LOI levels and POS variables was small, there might be stronger associations between some of the individual facets of policy implementation and POS variables. (The implementation of each facet is discussed in Technical Appendix A.) Given staff perspectives gleaned during interviews and focus groups, of particular interest were two facets.

Facet 2 centers around the integration of rigorous academic and career-focused curricula, the organization of the high school curriculum into career clusters and majors, the development of IGPs for all students, and the provision of opportunities for students to participate in work-based experiences. We expected that schools that had begun work on aspects of this facet before and/or during the early stages of EEDA, which would be reflected in a higher score on this facet in 2008-2009 when data were collected, would also have more POS2 programs in place and thus a lower average enrollment to POS2 program ratio by the end of the 2010-2011 school year.

As expected, there was evidence of a strong relationship between the score on this facet and a school's POS2 program ratio. As illustrated in Figure 2.12, the lower the ratio of enrollment to POS2 programs, the more likely that elements of this facet were in place. Schools in which staff described early starts on cluster development and/or commitment to POS2 program development had higher scores on this facet. Redwood and Azalea had low ratios in large part due to partnerships with local career centers in which POS2 programs were well established prior to EEDA. The staff at Iris not only were committed to the development of the POS2 programs but also benefitted from the established programs of their partner community college that were available to their students. Orchid, as discussed earlier, had a long-term commitment to offering CTE programs on its campus and the foundation for clusters and majors; thus POS2 programs were already being put into place prior to EEDA.

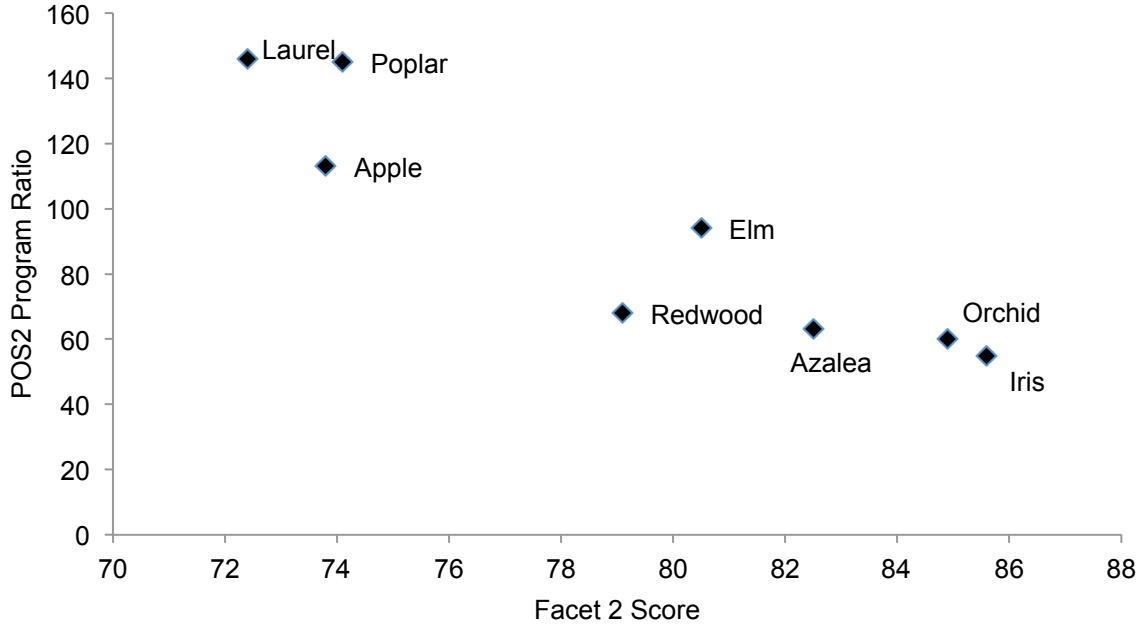

FIGURE 2.12. POS2 program ratios by scores on Facet 2: Career-focused curricula integration.

Laurel, the school that was designed around clusters and majors and thus would be expected to have a higher score on this facet and a lower enrollment to POS2 program ratio, appeared to be the exception to this relationship. However, earlier noted, Laurel's POS2 program ratio was misleading because the school was still relatively new when data were first collected; its numbers of programs drastically increased between 2008-2009 and 2010-2011, dropping the ratio at the school from 285:1 to 99:1. This put the school in the medium level of implementation on this facet and more in line with the pattern of other schools committed to implementation of elements of this facet.

A similar association was not found between the percentage of POS2 completers and scores on Facet 2.

The second facet that the team thought might be more highly associated with the ratio of enrollment to POS2 programs and also the percentage of POS2 completers was Facet 4. Facet 4 pertains to the implementation of evidence-based high school reform, which for all of our sample high schools meant the implementation of HSTW. Staff at schools like Orchid and Laurel mentioned that implementing HSTW gave them a big boost in implementing career-focused education and organizing curricula around career clusters and majors. We expected there to be a relatively strong relationship between higher scores on this facet and higher percentages of POS2 completers and lower POS2 program ratios and lower POS2 program ratios. Figures 2.13 and 2.14 illustrate the patterns in these variables across schools.

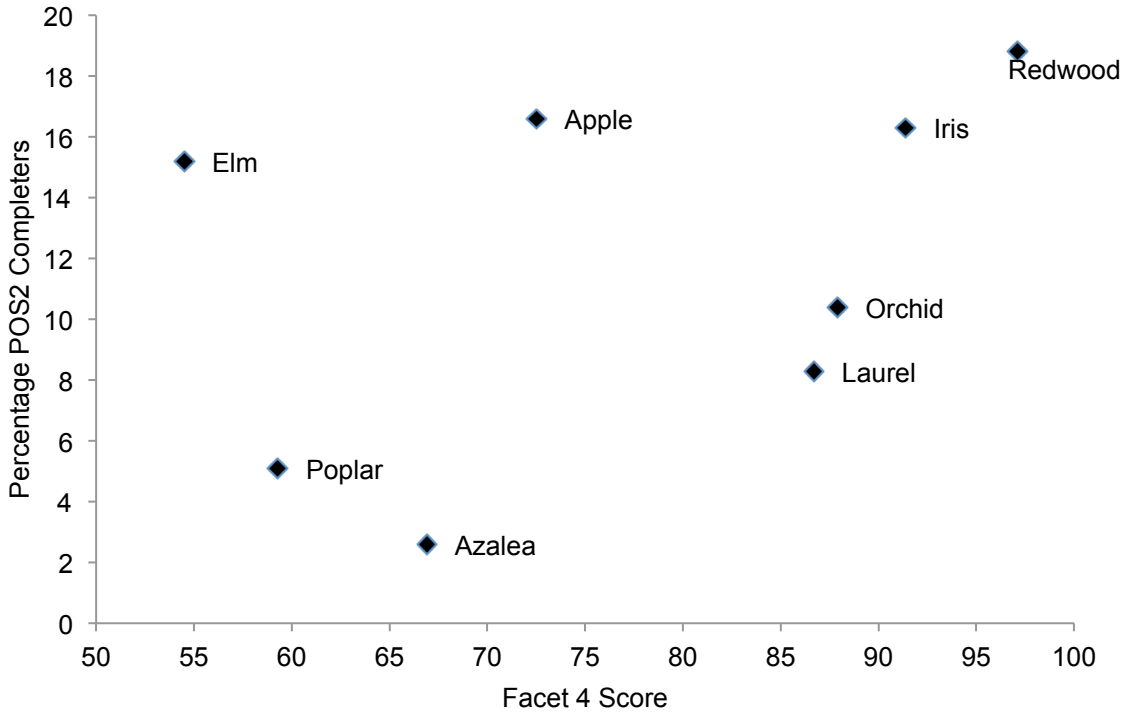

FIGURE 2.13. Percentage POS2 completers by scores on Facet 4: High school reform.

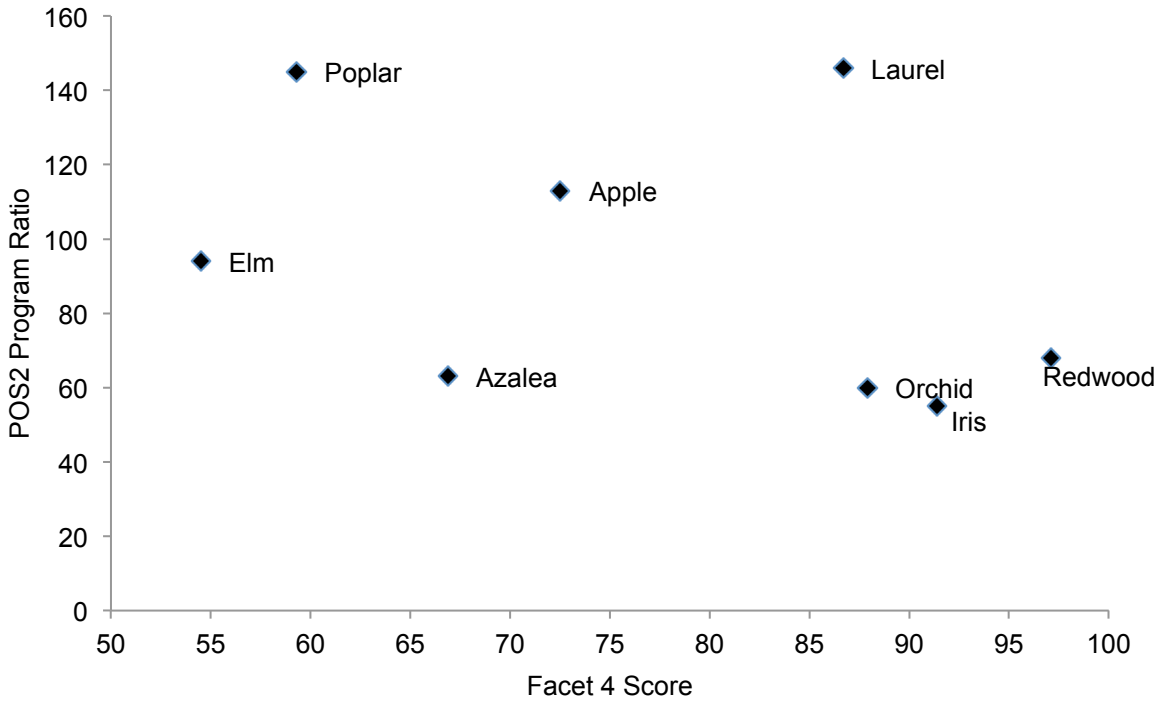

FIGURE 2.14. POS2 program ratios by scores on Facet 4: High school reform.

There was a small positive association found between the percentage of POS2 completers at a sample school and the school's scores on Facet 4, as outlined in Figure 2.13. This indicated that there was some relationship between the extent of implementation of HSTW at schools and the percentage of POS2 completers, in which schools that were found to be farther along in implementation were more likely to have higher percentages of POS2 completers. However, this relationship was stronger among schools with higher levels of implementation of this facet, whereas there was a lot of variation among schools with lower levels of implementation of this facet.

A similar but small association was also found between the ratio of student enrollment to POS2 programs at a school and the school's score on Facet 4, as shown in Figure 2.14. Similar to the pattern found for percentage of POS2 completers, the association was stronger for schools with higher levels of implementation of Facet 4 than for those with lower levels of implementation. Laurel, again, followed the pattern more closely than indicated in the figure due to the use of the average ratio over the three years and not the ratio in the last year that data were collected.

Although there was a strong relationship between the level of implementation of HSTW and both the POS2 programs ratio and percentage POS2 completers at Orchid, it was not as strong as might be expected. Staff told us that the structure for career pathways had been put into place prior to EEDA through implementation of HSTW and that the passage of EEDA only strengthened this orientation. But because the real impetus for the increase in their efforts on career pathways and curriculum integration, as reported by staff during interviews, came from

the development of Smaller Learning Communities, it lessened the impact of this facet on the school's POS outcomes.

In addition to an association between Facets 2 and 4 with some of the POS variables, there was also a slight negative association between the increased role of guidance personnel in career planning (Facet 3) and the POS2 program ratios. The higher the school scored on the increased roles of counselors in career education at the school, the lower the ratio between enrollment and POS2 programs, thus indicating better availability of POS2 programs to students at the school. The relationship was relatively weak, but strongest for those schools with the highest scores on this facet (it was less consistent for the other schools). No association was found between this facet and the percentage of POS2 completers.

Relationships between POV and POS1 and POS2. Schools with lower levels of community resources resulting in higher poverty (POV) scores consistently had the greatest proportion of POS1 students, whereas schools with higher levels of community resources (and lower POV scores) had fewer POS1 students. A similar pattern was found for POS2 program completers for the 2010-2011 school year. Schools with higher POV levels tended to have a higher percentage of POS2 completers than schools with lower POV levels. No clear connection, however, was found between the POV level and the number of POS2 programs at a school. Evidence was mixed as to an association between POV and ratios of school enrollment to POS2 programs (POS2 program ratios). The two schools with the lowest POV levels not only had smaller percentages of POS2 completers than other schools, but also had much higher POS2 program ratios than other schools. The pattern among the Medium and High POV schools was not as clear cut. The Medium POV schools tended to have similar POS2 program ratios but varied percentages of completers, whereas the High POV schools had exactly the opposite pattern. These relationships of poverty to POS variables are described in more detail in the next section.

The Influence of Local Economic Resources

Our second research question asked: "What impact does the level of local economic resources have on the implementation of EEDA and the development and implementation of POS?" As described in the Study Design section of Technical Appendix B, the eight sample schools were chosen to be diverse in community economic conditions. Ratings of community economic conditions for site selection were based on a poverty index from the 2007-2008 School Report Cards issued by the SDE and Census of Population data from 2000. When updated school data and community economic data were available, the original POV figures were revised to capture changes in local economies that may have occurred between 2000 and 2009. Table 2.18 shows that once put into an index, the order of the rankings of the sample schools stayed close to what the original selection data showed. It should be noted, however, that because the poverty index figures are not absolute, but are relative to other schools within the WIAs considered for inclusion in the study, if one area prospered, the index could show more relative improvement in that area and a reduction in conditions in other areas because they were relatively indexed.

The school that experienced the most dramatic changes in local economic conditions was Laurel, which experienced an overall improvement in economic conditions. Though located in a rural area of the state, Laurel is fairly close to one of the larger cities in the state. Over the years, it

may have benefited from that proximity. However, looking at community economic data for the community in which it is located, the economy appeared to have been quite volatile over the past several years, with wide fluctuations in both unemployment and per capita income. The community is fairly small, so changes in the economy—such as a major industry moving in or out—had a stronger impact per capita. A large industry employer fairly close to Laurel may also have had some impact. Whatever the cause, the community in which Laurel is located appeared to have experienced some influx of prosperity. Poplar, Laurel, and Orchid were the study schools that were closest to (or located within) larger urban areas of the state. The urban areas of the state may have been better able to capitalize on changes in economic opportunities than the rural portions of the state; proximity to an urban area may have benefited nearby communities. One of our more urban sample schools, Orchid, was originally included as a high-poverty cluster school. Orchid's site selection poverty index score was 9; it was thus ranked as having the fourth most economically challenged community location. After our adjustments for new school poverty indices and census estimates of community poverty, Orchid switched places in poverty ranking with Redwood. Redwood, located in a smaller, more rural community, took on a relatively higher poverty ranking than Orchid between our 2000 and 2009 ratings.

Table 2.18
Original and Revised Community Poverty Indices per School

School	Original Site Selection Poverty Cluster: 2000	Original Community Poverty Index 2000	Revised Community Poverty Index 2009	Change in Index[a]
Poplar	Low-to-moderate	2	2	0.0%
Laurel	Low-to-moderate	4	2	50.0%
Azalea	Low-to-moderate	4	5	-25.0%
Redwood	Low-to-moderate	6	8	-33.3%
Orchid	High	9	7	22.2%
Elm	High	12	10	16.7%
Apple	High	12	11	8.3%
Iris	High	12	12	0.0%

[a] Positive numbers in the Change in Index column represent improvements in conditions relative to other schools in the areas of the state we considered for this study.

Overall Trends by POV

In addition to school-specific qualitative and quantitative data, anecdotal evidence of the effect of poverty on policy implementation was collected during site visits. One of the requirements of the EEDA is that every student, beginning in eighth grade, is to attend a yearly IGP meeting with a guidance counselor and a parent or guardian present. Guidance personnel at one of the schools with low levels of school and community resources noted that parents in lower income and rural communities had transportation problems or difficulty taking time off work to attend meetings. There were also reports from several schools that information on IGP meetings and the process was not consistently reaching all parents. Various factors can hinder the ability of schools to get information out to parents, including lack of home resources such as computers in lower income homes. On the other hand, during a site visit interview at one of the lower poverty (more

affluent) schools, guidance personnel reported that many of their students' parents pushed dual credit and AP courses and college prep. For those parents, the IGP meetings might not be a priority. This information at this lower poverty school was given in the context of why more students were not signing up for CTE classes. With students trying to take as many high level, college credit earning, core curriculum classes, it is difficult to schedule the courses needed for CTE POS.

The study team reviewed some of the mandated activities of the policy, including the IGP meetings, and included questions in the *Student Engagement/POS Experiences Surveys* to investigate whether local poverty is related to the degree to which those activities were observed across the sample schools. The team looked at student-level data from the student surveys (Class of 2009 as seniors and the Class of 2011 as sophomores and as seniors) and also analyzed SLDS (Class of 2009 cohort and Class of 2011 cohort) data across levels of the school community poverty index. Below are some highlights from various data sources.

Career clusters, majors, career planning, and IGPs, by POV. Across the state, schools reported to the state that over 98% of all students at all grade levels (eighth-twelfth grades) had IGPs in place for 2010-2011 (South Carolina Department of Education, 2011, S. Moore, personal communication). For our SLDS cohorts, we find that 100% of the students in the SLDS 2011 cohort across all schools had prepared an IGP at some point between ninth and twelfth grades. Even some students in the SLDS 2009 cohort had IGPs, though the Class of 2009 would not have been required to have IGPs. Table 2.19 illustrates the percentage of students within the SLDS cohorts who had an IGP at some point between ninth and twelfth grade.

Table 2.19
Percentages of Students in SLDS Cohorts Who Completed an IGP Sometime in High School, Ordered from Lower to Higher POV

	2009 Cohort (Percent)	2011 Cohort (Percent)	Difference
Poplar	0.6	100.0	99.4
Laurel	39.8	100.0	60.2
Azalea	92.7	100.0	7.3
Redwood	0.0	100.0	100.0
Orchid	0.5	100.0	99.5
Elm	0.0	100.0	100.0
Apple	0.0	100.0	100.0
Iris	0.0	100.0	100.0
Total	14.2	100.0	85.8

On the on-site *Student Engagement/POS Experiences Surveys*, students were asked if they had put together an IGP plan. For the Class of 2011 as sophomores and seniors, the percentages of students responding "yes" to putting together an IGP or four-year plan were higher at High poverty schools than at Moderate or Low poverty. The percentages of students at Moderate poverty schools across all three groups of students responding yes were also higher than those at Low poverty schools (Table 2.20).

It should be noted that members of the Class of 2009 at all schools in South Carolina were not required to have IGPs. It is surprising that a majority of seniors in the Class of 2009 indicated on the *Student Engagement/POS Experiences Survey* that they had put together a career plan. Some schools across the state did have other types of career planning tools in place prior to EEDA and some actually implemented the EEDA policy for classes ahead of schedule. It is therefore possible that some of the Class of 2009 may have actually had EEDA IGPs, but it is also possible that some members of the Class of 2009 had other types of high school course planning tools and thus responded "yes" to that survey question.

Table 2.20
Student Survey Question: "Have You Put Together a "Career Plan" or 4-Year 'Individual Graduation Plan (IGP),' that Outlines a Series of Activities and Courses that You Will Take throughout High School?"

	Percentage of Respondents	Senior Class of 2009 (N = 986) % (N)	Sophomore Class of 2011 (N = 1388) % (N)	Senior Class of 2011 (N = 905) % (N)
High Poverty (N = 949)	Yes	52.1 (162)	76.7 (263)	78.6 (232)
	No	34.7 (108)	13.1 (45)	8.8 (26)
	Don't Know	13.2 (41)	10.2 (35)	12.5 (37)
	Total	100.0 (311)	100.00 (343)	100.0 (295)
Moderate Poverty (N = 1222)	Yes	52.1 (221)	66.8 (275)	66.6 (257)
	No	30.7 (130)	17.7 (73)	17.4 (67)
	Don't Know	17.2 (73)	15.5 (64)	16.1 (62)
	Total	100.0 (424)	100.00 (412)	100.0 (386)
Low Poverty (N = 1108)	Yes	49.4 (124)	56.9 (360)	60.3 (135)
	No	31.9 (80)	22.4 (142)	21.4 (48)
	Don't Know	18.7 (47)	20.7 (131)	18.3 (41)
	Total	100.0 (251)	100.0 (633)	100.0 (224)

Note. Does not include multiple responses, missing responses, or not applicable responses.

An indication of how far along our sample schools were in getting their electronic IGP (eIGP) systems up and running may be found by looking at early district data, provided by SDE in Spring 2008. According to 2008 data on schools' progress toward implementing the eIGP system, three of our original four high poverty schools are in districts that were a little over half as far along on a scale of 0-8 as districts in which three of the four Low/Moderate poverty schools are located. The anomalies, in terms of levels of poverty and eIGP progress, are Iris and Azalea, as shown in Table 2.21. The district in which Iris is located was farther along toward eIGP implementation than districts where the other High poverty schools in our sample are located. The district in which Azalea is located was not as far along as districts where the other Low to Moderate poverty schools are located.

The *Student Engagement/POS Experiences Survey* included two questions on the selection of career clusters and selection of high school majors within the career clusters. The EEDA policy

requires students to select, by the end of the eighth grade, a career cluster in which to focus, and by the tenth grade, a high school major within that cluster. Students may change clusters and majors at any time. Cluster and major selections are recorded on the student IGPs. Tables 2.22 and 2.23 present information on students' self-reports of selection of clusters and majors, from the student surveys of Class of 2009 as seniors and the Class of 2011 as sophomores, and seniors, by level of POV. It's not surprising that the percentages of "yes" answers across both of these questions and across all three levels of POV are higher for the sophomores. The survey was administered just after the students' sophomore school year. Most of them, therefore, would have just completed their tenth-grade IGPs, in which selection of a major would have been required. What is interesting that for both questions ("Have you selected a career cluster?" and "Have you selected a major?"), the greatest percentages of "yes" answers were from the sophomores and seniors (Class of 2011) at the high poverty schools. This finding could indicate higher implementation of this portion of the policy at high poverty schools, or it could indicate that the students in the high poverty schools are more likely to recall selecting a cluster and major.

Table 2.21
District Progress toward Electronic IGP Implementation, 2008

School	School Poverty Cluster Determined Prior to Site Selection: High Poverty or Low to Moderate Poverty	Progress in District Toward eIGP Implementation as of 2008, Original Scale of 0-8, Grouped into 4 Levels
Apple	High	Mid Level - 3
Elm	High	Mid Level - 3
Orchid	High	Mid Level - 3
Iris	High	Mid Level - 4
Azalea	Low-to-moderate	Low Level - 2
Laurel	Low-to-moderate	Mid Level - 4
Poplar	Low-to-moderate	Mid Level - 4
Redwood	Low-to-moderate	Upper Level - 4

Note. Personal communication with State Department of Education. Progress by districts statewide was provided on a scale of 0-8. Schools were not identified. Levels were determined by the study team based on status information provided. Statewide, 6% of the 86 reporting districts were at Level 1 (had not begun/little work on getting eIGP system - lack of equipment and/or training); 10% were at Level 2 (schools generally connected to the system - some equipment, software and data processing in place, some training); 27% were at Level 3 (schools testing the system – using data and testing entry/transmission, etc.); and 50% were at Level 4 (schools near full production and use of eIGP system, e.g. curriculum converted to production, security in production, or using system to create student eIGPs).

Review of SLDS data shows that health sciences is the most popular cluster listed on student IGPs for the SLDS 2011 cohort (Class of 2011 students who were at one of our sample schools each of three years tenth, eleventh, and twelfth grade). Science, technology, engineering, and mathematics (STEM) and arts, audio video technology and communications follow health sciences in popularity for that cohort. Figure 2.15 illustrates these findings. Note that the data illustrated in Figure 2.15 are from the tenth-grade IGPs for our defined 2011 SLDS cohort.

Table 2.22
Student Survey Question: "Have You Selected a Career Cluster to Plan for?"

	Percentage of Respondents	Senior Class of 2009 (*N* = 1020) % (*N*)	Sophomore Class of 2011 (*N* = 1442) % (*N*)	Senior Class of 2011 (*N* = 929) % (*N*)
High Poverty (*N* = 980)	Yes	84.8 (278)	89.3 (317)	88.2 (262)
	No	11.3 (37)	6.2 (22)	6.1 (18)
	Don't Know	4.00 (13)	4.5 (16)	5.7 (17)
	Total	100.0 (328)	100.0 (355)	100.0 (297)
Moderate Poverty (*N* = 1255)	Yes	78.5 (339)	86.7 (365)	84.8 (341)
	No	12.3 (53)	6.4 (27)	7.5 (30)
	Don't Know	9.3 (40)	6.9 (29)	7.7 (31)
	Total	100.0 (432)	100.0 (421)	100.0 (402)
Low Poverty (*N* = 1156)	Yes	81.5 (212)	82.0 (546)	80.9 (186)
	No	6.9 (18)	6.0 (40)	10.0 (23)
	Don't Know	11.5 (30)	12.0 (80)	9.1 (21)
	Total	100.0 (260)	100.0 (666)	100.0 (230)

Note. Does not include multiple responses, missing responses, or not applicable responses.

Table 2.23
Student Survey Question: "Have You Selected a High School Major Within That Career Cluster?

	Percentage of Respondents	Senior Class of 2009 (*N* = 994) % (*N*)	Sophomore Class of 2011 (*N* = 1409) % (*N*)	Senior Class of 2011 (*N* = 898) % (*N*)
High Poverty (*N* = 947)	Yes	54.9 (173)	69.7 (241)	68.9 (197)
	No	28.3 (89)	14.2 (49)	16.4 (47)
	Don't Know	16.8 (53)	16.2 (56)	14.7 (42)
	Total	100.0 (315)	100.0 (346)	100.0 (286)
Moderate Poverty (*N* = 1225)	Yes	46.8 (199)	61.3 (252)	51.7 (201)
	No	31.3 (133)	16.6 (68)	23.1 (90)
	Don't Know	21.9 (93)	22.1 (91)	25.2 (98)
	Total	100.0 (425)	100.0 (411)	100.0 (389)
Low Poverty (*N* = 1129)	Yes	52.8 (134)	60.4 (394)	58.7 (131)
	No	22.4 (57)	15.5 (101)	19.7 (44)
	Don't Know	24.8 (63)	24.1 (157)	21.5 (48)
	Total	100.0 (254)	100.0 (652)	100.0 (223)

Note. Does not include multiple responses, missing responses, or not applicable responses.

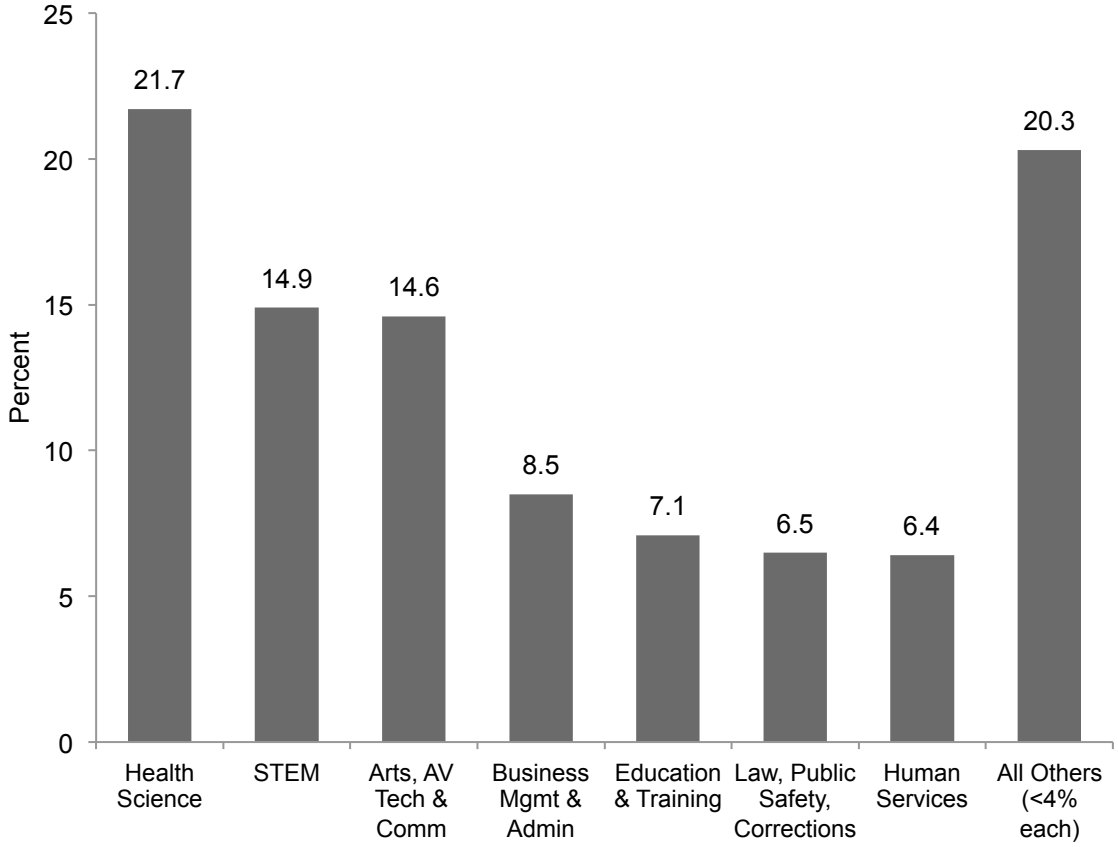

FIGURE 2.15. IGP major clusters chosen in 10th grade by SLDS 2011 cohort.

Table 2.24 presents the top IGP career clusters by poverty level and implementation level, excluding health sciences. Health sciences is among the top two most popular areas for each of the eight schools, regardless of LOI level or POV level, with 12 to 27% of students across schools choosing a major in the health sciences cluster for their tenth-grade IGPs. STEM was popular at the Medium and Low poverty schools, but not so much at the High poverty schools. Arts, audio-video technology & communications and business, management & administration were popular across schools of all poverty and implementation levels (similar to health sciences).

IGP data from the SLDS 2011 cohort, show that as of tenth grade, about one-third of the 2011 cohort planned to complete their selected majors. About 40% indicated that as of tenth grade, they were just declaring a major, without an intention to complete the major at that point. Less than one-third of the IGPs had missing data on intentions to complete a particular major as of tenth grade.

IGP intentions do not appear to be clearly related to POV (Table 2.25). Two schools in the most disadvantaged communities (POV indices of 9 to 12) had relatively high percentages of students planning to complete majors (73.1% and 95.5%), but one did not (33.3%). The school with the most intended completers as of tenth grade (Apple, 95.5%) was on the high end of the poverty scale (POV index = 11). Apple also had the second highest percentage of POS1 students (33%). However, the school with the highest percentage of POS1 students (Iris, 36%) and the highest

POV (POV = 12) was the school with 33.3% of tenth graders intending to complete their career majors in high school. This could be an indication that intentions were highly related to actual completion at this school or it could indicate lower expectations of completion or there could be some other explanation. One of the Low POV schools (Poplar, POV = 2) only had 5.4% of their tenth graders planning to complete their high school majors, whereas the other Low POV school (Laurel, POV = 2) had 47% of their students planning to complete their majors.

Table 2.24
Top IGP Career Clusters (Excluding Health Sciences): 10th Grade IGPs of 2011 SLDS Cohort

	EEDA Policy Implementation (LOI) Level		
POV Level	Low (60.0-69.9)	Medium (70.0-79.9)	High (80.0-89.9)
High (9-12)	Arts, AV Tech & Comm; Business, Mgmt & Admin	Arts, AV Tech & Comm; Human Services; Education & Training	
Medium (5-8)		Arts, AV Tech & Comm; Education & Training; Architec & Construction	STEM; Human Services; Education & Training
Low (0-4)	STEM; Business, Mgmt & Admin	STEM; Arts, AV Tech & Comm	

It should be noted that completion of majors is not a requirement. Some schools may encourage completion of majors through special recognitions or certificates of completion at graduation. The study group heard about this in one of the pilot interview schools, but we did not find that this was highlighted as a practice at any of our sample schools. (This, however, was not specifically investigated.) SLDS data showed that Cohort 2011 students who stated that they planned to complete their chosen major were almost twice as likely to complete a logical 4-course CTE progression, and be considered POS1 completers for this study, than students who reported that their major was "Declaration Only" (significant at the $p < 0.001$ level). However, 81% of intended major completers in the cohort did not complete a POS1.

Table 2.25
Percentages of 10th Grade IGPs of SLDS 2011 Cohort Indicating Intentions to Complete Majors

	LOI		
POV Level	Low (60.0-69.9)	Medium (70.0-79.9)	High (80,0-89.9)
High (9-12)	73.1% (Elm)	95.5%, 33.3% (Apple, Iris)	
Medium (5-8)		91.4% (Azalea)	41.7%, 20.0% (Orchid, Redwood)
Low (0-4)	5.4% (Poplar)	47.0% (Laurel)	

The EEDA policy does not require, encourage, or discourage *completion* of high school majors, and allows students to switch majors and clusters declared on their IGPs at any time during high school. At least a couple of high school seniors mentioned during focus group interviews that they thought it was better to change majors in high school rather than in college. One student

talked about how she had been in one career area, but found out that it wasn't what she thought it would be and thus switched into something she likes much better. Analyzing SLDS data for the 2011 cohort, we found that the percentage of students who switched IGP career clusters between tenth grade and twelfth grade varied across high schools from 21% at Iris High to 55% at Elm High. Both Iris and Elm fall on the high side of the community poverty scale (Figure 2.16).

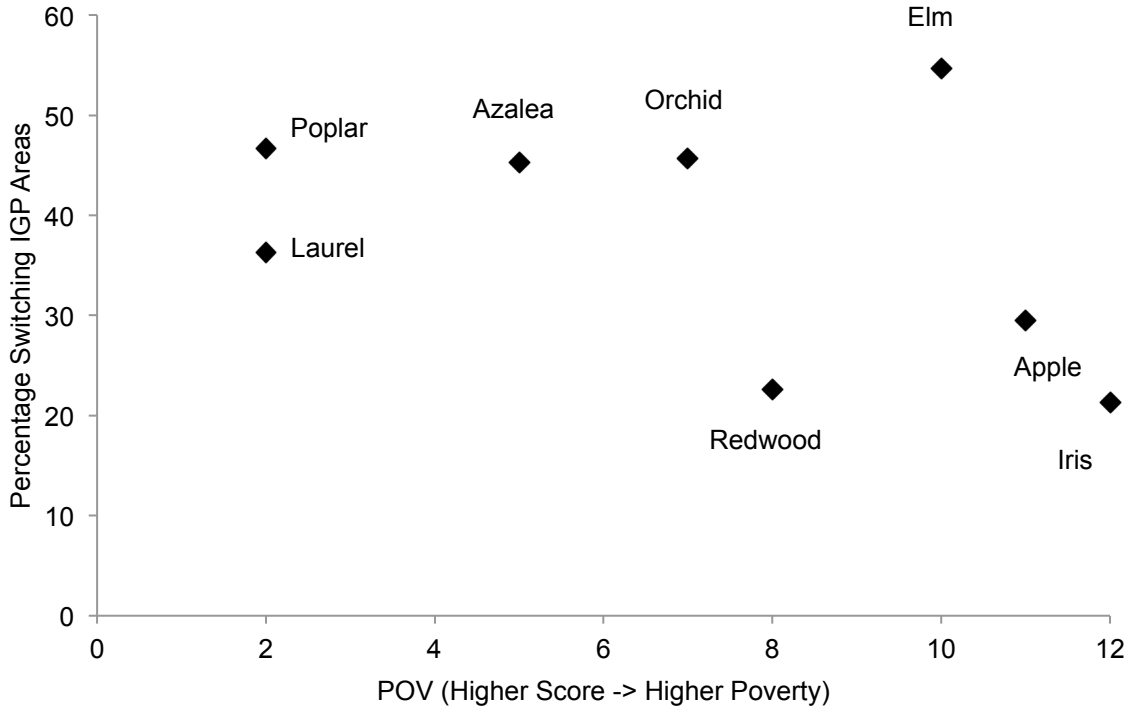

FIGURE 2.16. Percentages of SLDS cohort 2011 students at sample schools whose IGPs indicate a change in career cluster between tenth-grade IGP and twelfth-grade IGP, by POV.

There could be any number of reasons why a student would switch clusters between tenth grade and twelfth-grade. More switching between clusters may be related to being in a community with more employment options. Perhaps students recognize more variety in career paths open to them in communities where more people are working in more varieties of jobs. As mentioned earlier, both Poplar and Orchid are located fairly close to one of the larger cities in the state. Laurel and Elm are also fairly close to larger cities as is Azalea. Redwood, Apple and Iris are not as close to more populated areas of the state. Switching clusters could also show more emphasis on exploration of careers. However, switching clusters could show lack of clarity in options or lack of adequate guidance/direction. Not switching clusters during high school could indicate an increased sophistication toward career options during the course of high school in the more disadvantaged or more rural areas, whether due to the IGP process or something else. Or it could indicate less variety in options apparent to students in these geographical areas. Both switching and not switching could be related to a lack of available courses. Switching could be related to poor access to courses in certain clusters; a student in a higher grade level may find that he/she has taken all the courses desired or available in a certain cluster and then change to another for the course options or there could be other reasons.

Student focus group data provide some insight into how the IGP is used in ways perhaps not captured when only looking at career plans. Reviewing student focus group transcripts from Apple, one of the more remotely located schools, there are indications that the IGP provides more than just a career path for the students. At this school, in particular, other things were mentioned. One student at Apple said "It [the IGP pr**o**cess] caused me to sit with my mom and counselor to plan." Another Apple student said "It [the IGP process] influenced us to be serious with school…not playtime." Another said "The [IGP] process has helped me realize that I need math." Clearly, there is more going on during the IGP process than career planning. At Poplar, one of the schools with students who switched clusters the most, student focus group transcripts include statements about meeting each year with the counselor and the counselors' doors always being open. The emphasis from the student's point of view seemed to be more about trying things and discovering interests, rather than focusing on one particular career cluster, major, or POS throughout high school.

Career planning. Focusing again on the results of the *Student Engagement/POS Experiences Survey*, some data related to clusters, majors and IGPs did not vary significantly across school community poverty levels. The number of times that seniors in the Class of 2011 from High, Moderate, and Low poverty schools talked with a guidance counselor when putting together a career plan or IGP did not significantly differ, with between 50% and 60% indicating they had spoken with their guidance counselor three or more times while putting together this plan. Also, for all levels of the poverty indicator score, a majority of seniors in the Class of 2011 indicated that a guidance counselor was the most helpful in developing a career plan (59.2% in High poverty schools, 61.6% in Moderate poverty schools, and 55.3% in Low poverty schools) and this did not vary significantly across POV.

Students were asked if they had discussed particular topics including courses to take, going to college, possible jobs or careers for adulthood, finding a job after high school, steps necessary to pursue a career, and applying for college or vocational/technical school with their guidance counselor between the start of the ninth grade and the time the survey was administered. Of these topics, seniors in the Class of 2011 at the three levels of POV differed in their responses of discussing going to college ($p = 0.001$), finding a job after high school ($p < 0.001$), steps necessary to pursue a career ($p < 0.001$), and applying for college or vocational/technical school ($p = 0.033$). Table 2.26 presents any differences related to the community poverty index to these questions on the *Student Engagement/POS Experiences Survey* about what was discussed with guidance counselors. The table presents comparisons of responses from the Class of 2009 as seniors and the Class of 2011 as sophomores and seniors.

Responses to questions involving talking to counselors about four of the topics listed in Table 2.26. (items b, d, e, and f) appear to vary depending on POV. Students in schools in mid-POV communities reported more that they had talked to guidance about going to college as well as applying to college and steps to pursue their careers. Students in Low POV communities reported much less talking to guidance about finding a job after high school, a good bit less talking to guidance about steps necessary to pursue their careers and somewhat less talking to guidance about going to college, compared to both the mid and high POV groups. Community poverty does not seem to be related to items a or c, students talking to guidance about what

courses to take in high school or possible jobs or careers as an adult. However, it is interesting that seniors from the Class of 2009 in the Low POV (more affluent) communities had a much lower percentage who reported talking to guidance about possible jobs or careers as an adult, compared to the Moderate and High POV schools than the seniors from the Class of 2011 reported on that topic compared to their counterparts in Moderate and High poverty schools.

Table 2.26
Student Survey Question: "Between the Start of 9th Grade and Now, Have You Talked to a School Guidance Counselor about the Following Topics?"

	Percentage "Yes" Respondents	Senior Class 2009 % (*N*)	Sophomore Class 2011 % (*N*)	Senior Class 2011 % (*N*)
High Poverty	a. What courses to take this school year (*N* = 970)	89.0 (290)	88.9 (312)	94.5 (277)
	b. Going to college (*N* = 969)	87.0 (281)	74.2 (261)	88.1 (259)
	c. Possible jobs or careers when you are an adult (*N* = 963)	69.9 (225)	63.4 (222)	74.2 (216)
	d. Finding a job after high school (*N* = 964)	55.4 (179)	42.7 (149)	54.8 (160)
	e. Steps necessary to pursue your career (*N* = 964)	72.6 (236)	68.9 (239)	76.7 (224)
	f. Applying for college or vocational/technical school (*N* = 967)	82.8 (269)	48.9 (171)	80.8 (236)
Moderate Poverty	a. What courses to take this school year (*N* = 1248)	92.1 (395)	90.7 (381)	93.7 (374)
	b. Going to college (*N* = 1246)	91.3 (390)	76.9 (323)	94.7 (378)
	c. Possible jobs or careers when you are an adult (*N* = 1238)	80.7 (343)	70.1 (295)	78.3 (307)
	d. Finding a job after high school (*N* = 1245)	59.4 (253)	39.2 (165)	53.3 (212)
	e. Steps necessary to pursue your career (*N* = 1243)	77.5 (330)	66.8 (279)	78.5 (313)
	f. Applying for college or vocational/technical school (*N* = 1244)	87.3 (372)	50.5 (212)	87.4 (348)
Low Poverty	a. What courses to take this school year (*N* = 1124)	93.3 (238)	93.3 (600)	94.5 (213)
	b. Going to college (*N* = 1121)	87.5 (223)	66.9 (428)	87.2 (197)
	c. Possible jobs or careers when you are an adult (*N* = 1118)	58.3 (148)	59.9 (383)	70.7 (159)
	d. Finding a job after high school (*N* = 1121)	32.6 (83)	29.0 (186)	31.1 (70)

e. Steps necessary to pursue your career (*N* = 1114)	55.1 (140)	58.1 (370)	60.1 (134)
f. Applying for college or vocational/technical school (*N* = 1119)	76.6 (196)	37.5 (239)	81.3 (183)

Note. Does not include multiple responses, missing responses, or not applicable responses.

POV and LOI

The concepts of LOI and POS have already been introduced and discussed. The study team plotted POV against LOI and POS variables to see if any relationships were obvious. A discussion of relationships between the level of local economic resources in each school's community (POV) and the levels of policy (LOI) will be presented first, and in the next section relationships between POV and POS measures at each school are discussed.

As shown in Figure 2.17, there appears to be no clear relationship between the level of community economic resources (POV) and the level of EEDA implementation (LOI) at the schools.

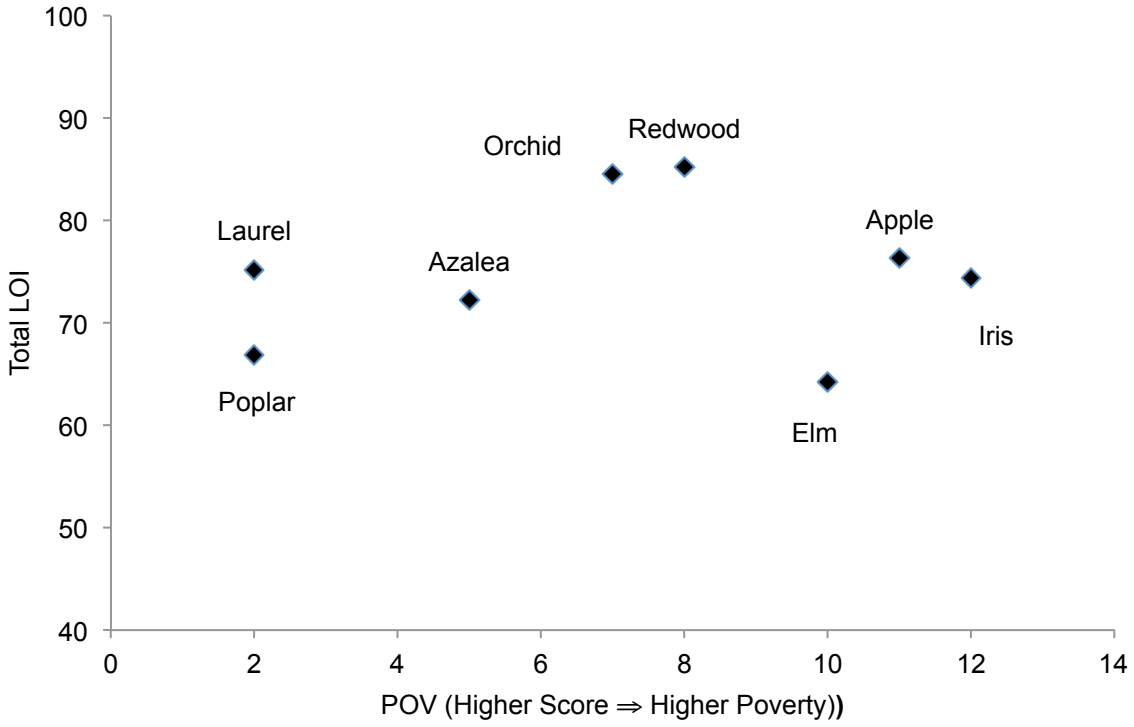

FIGURE 2.17. School community poverty index (POV) by school EEDA policy LOI.

To investigate the association of specific facets of the EEDA with community economic conditions, we created six scatter plots, each with an LOI (level of policy implementation) facet score as a dependent variable and the POV variable (community economic index) as the independent variable. (See Part II of this report for a full discussion of the six facets of policy

implementation.) The results from these analyses were simply exploratory, to see if any trends surfaced. Again, no strong relationships appear between POV and the facets of LOI; however, there are a few interesting notes related to POV. Most of the slight relationships noted were positive (indicating higher poverty associated with higher implementation), which, although contrary to the expected relationship between the lack of resources and the ability to implement a reform policy, could indicate more perceived need for college and career-readiness reform in the higher poverty schools. There were, however, slightly negative relationships noted between POV and two facets (Facet 1 and Facet 5). That could indicate that for those facets, community poverty could have slightly more of a negative impact on the ability to implement those parts of the policy. Facet 5 was defined as the facilitation of education/business relationships and dissemination of information. The relationship between Facet 5 and POV was very slightly negative. Facet 1 states that all schools are required to identify students at risk of dropping out of school using the criteria defined by the State Board of Education, and to adopt one or more of the evidence-based strategies identified by the Board to assist identified students. Again the relationship between Facet 1 and POV was very slightly negative and not significant. However, if these two portions of the policy are more of a challenge in the higher poverty schools, it could indicate that these are areas that need addressing. Figure 2.18 shows the scatter plot of POV and LOI facet 1.

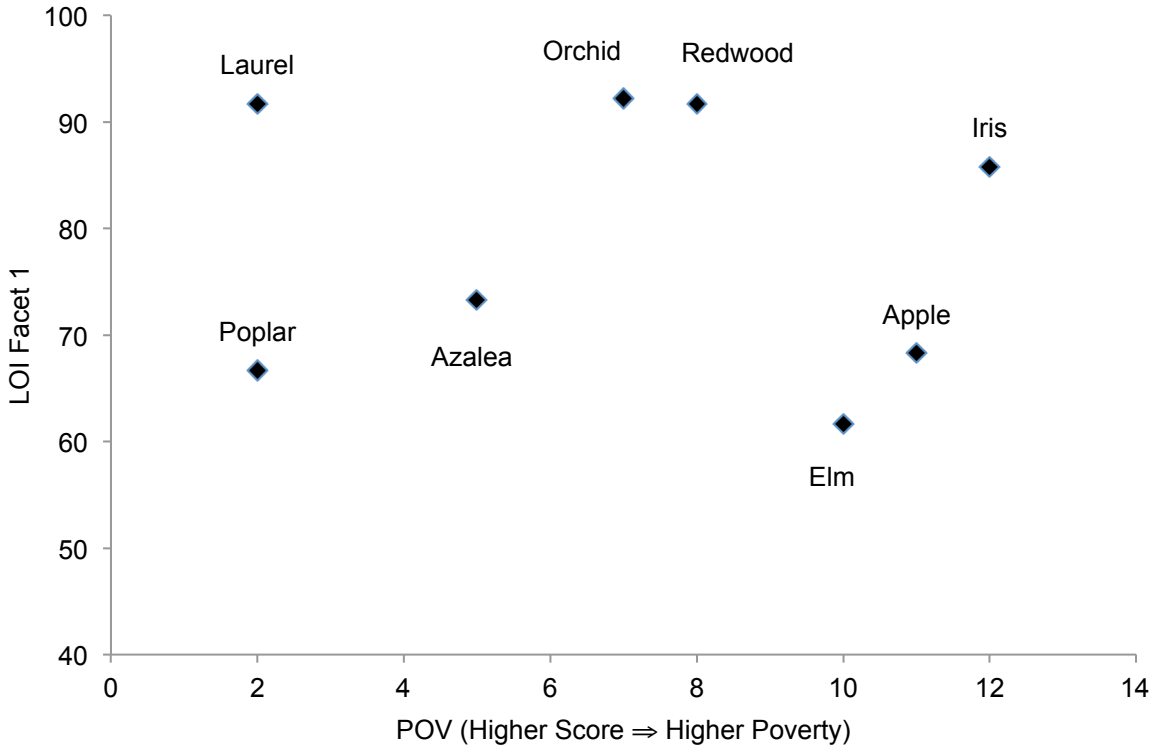

FIGURE 2.18. School community poverty index (POV) versus facet 1 of the EEDA policy implementation level (LOI): Assist high-risk students.

Facet 2 of LOI measures integration of rigorous academic and career-focused curricula, organized into career clusters and majors. High schools must implement at least three career clusters (which may be chosen from the 16 federally defined career clusters), organize curricula

around these three clusters, and create majors within them. All students are required to take 17 core academic courses. Students should meet these requirements with courses that best fit their selected major/career cluster. School districts must provide work exploration guidance activities and career awareness programs that combine counseling on career options and experiential learning with academic planning to assist students throughout their high school years in fulfilling their IGPs. Every eighth grader will design an Individual Graduation Plan (IGP) that will serve as a guide for academic, career, and postgraduation transition planning. The IGP is to be developed with input from guidance personnel, parents, and students.

Facet 2 (see Figure 2.19) is the most strongly associated with POV, of the six facets, though there is still not a significant relationship. It was more strongly related to POV than total LOI was. As with total LOI, there was a slightly positive relationship noted between facet 2 and LOI, meaning that the higher the level of community poverty, the greater the implementation of this facet. The fact that there is a stronger relationship between facet 2 and POV, as compared to other facets and total LOI, could indicate that the elements of this facet do not require many resources, but that is not a likely explanation. Providing experiential learning and work exploration would require resources as would the other elements of facet 2. And although the guidance requirements are one part of the state policy actually funded by the state, these guidance elements are more covered in facet 3, i.e., not captured as much in facet 2. That leaves one more likely explanation to the fact that facet 2 is positively associated with community poverty and that is that the elements of facet 2 may be deemed by the schools and the districts themselves to be more needed in high poverty areas and thus resources (both monetary and non-monetary) are funneled into these activities.

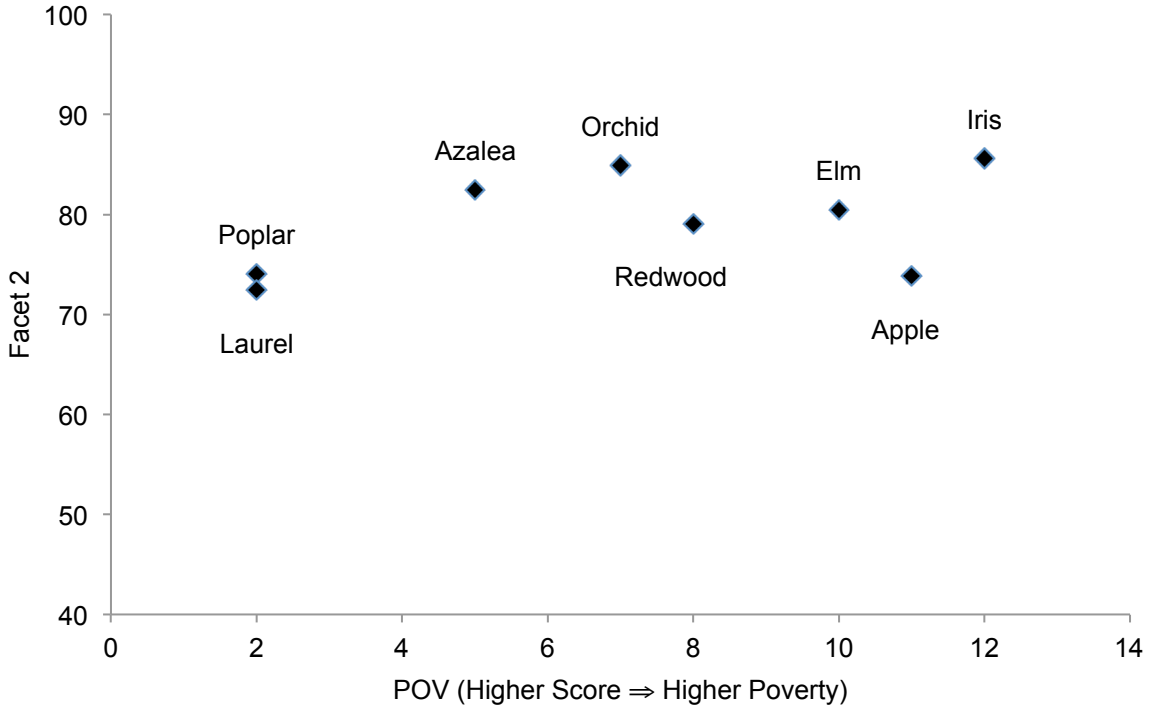

FIGURE 2.19. School community poverty index (POV) by facet 2 of the EEDA policy implementation level (LOI): Career-focused curricula integration.

POV and POS1, POS2 and POS3. The relationship between POS1 students (those completing 4 course sequences in a CTE program) and POV is quite strong. Figure 2.20 shows POV and the percentage of POS1 students in the 2011 cohort (students who were twelfth graders in 2010-2011 and who had been at one of the sample schools for three consecutive years – tenth, eleventh, and twelfth grades). More disadvantaged schools have the greatest proportion of students completing POS1s, whereas less disadvantaged schools have fewer POS1 students.

In order to illustrate three variables, Figure 2.20 also includes markers indicating LOI scores of schools. The lack of an obvious relationship between LOI and CTE completion is discussed in more detail with regard to Research Question 3. It is interesting to note, however, that when POV levels are similar, such as for Laurel and Poplar; Azalea, Orchid and Redwood; or Apple, Elm and Iris, LOI does seem to be related to CTE program completion. Note that Redwood, though grouped in the same LOI level as Orchid, had a higher LOI score than Orchid and indeed had the highest LOI score of the eight sample schools.

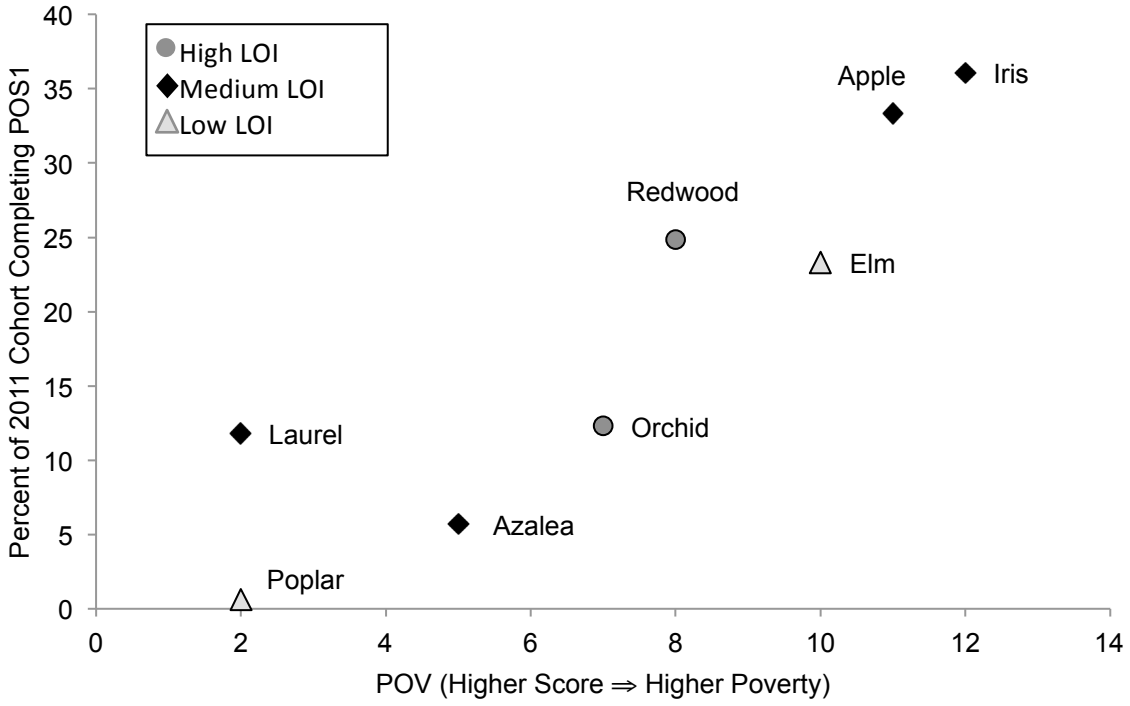

FIGURE 2.20. SLDS Cohort 2011 POS1 completion by community poverty index, with LOI noted.

Similarly, Figure 2.21 shows data from the state CATE office on number of CTE completers by year, there tends to be a positive relationship between POV and the percentage of POS2 completers (number of completers as a percentage of eleventh- and twelfth-grade enrollment). The higher the community poverty index (a higher index indicates greater poverty), the greater the percentage of POS2 completers. By the twelfth grade for the Class of 2011 (school year 2010-2011), students in this cohort would have had the opportunity to have been identified by the state CATE office as completers. For our percentage of POS2 students, the number of CTE completers at each school for the school year 2010-2011 was divided by the eleventh- and

twelfth-grade enrollment at each school to control for school size.

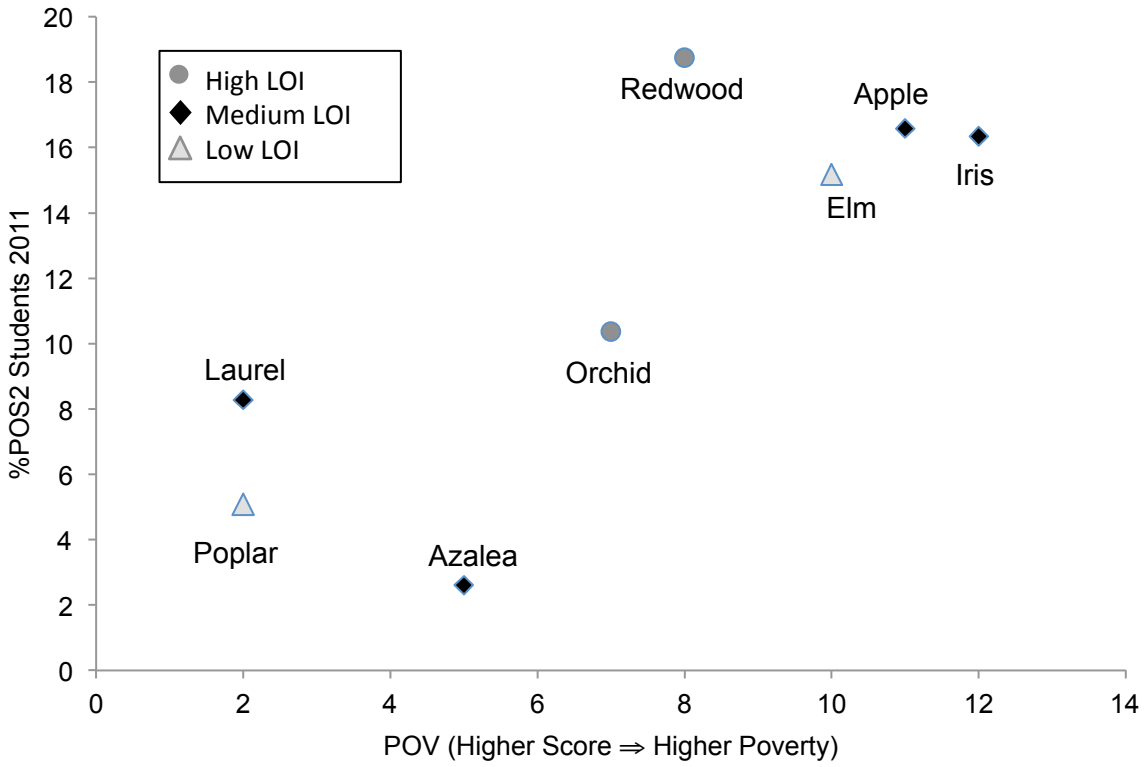

FIGURE 2.21. Percentage of POS2 completers by school, by POV, 2010-2011 school year, with LOI noted.

When looking at POS2 from the number of programs point of view (Figure 2.22), the relationship to poverty is not as clear. In general, there is a negative relationship between the POS2 programs ratio and POV, i.e., the higher the POV, the lower the ratio of enrollment to programs, but this is very inconsistent across schools. Recall that a lower POS2 ratio indicates more programs per enrollment, so a Low POS2 programs ratio indicates more program options for students. Iris, Redwood, Orchid and Azalea are the schools with the lowest POS2 program ratios and thus the most program offerings per student. Poverty varies for these schools (POV = 12, 8, 7, and 5 respectively), although none of these schools is a Low POV school. It is, nevertheless, difficult to see a clear connection between POV and the number of POS2 programs at schools. As a note, LOI might be expected to be related to number of programs because program availability was a small part of LOI calculation. The two schools with the highest LOI (Redwood and Orchid) do indeed fall low in regards to the y, or POS2 ratio axis, indicating that POS2 program offerings are greater compared to enrollment at these two schools. However Azalea and Iris are Medium LOI schools and their POS2 ratios are also low.

As illustrated in Figure 2.23, the schools located in less economically disadvantaged communities (Laurel and Poplar) not only have a higher ratio of school enrollment to POS2 programs available, but also have smaller percentages of POS2 completers than other schools. Laurel had the highest average yearly growth in number of POS2 programs at their school

(nearly doubling their numbers of programs with concentrators each year between 2009 and 2011). The lower figures in the earlier years of the POS2 programs ratio average penalize Laurel in terms of *average* numbers of programs over the time period.

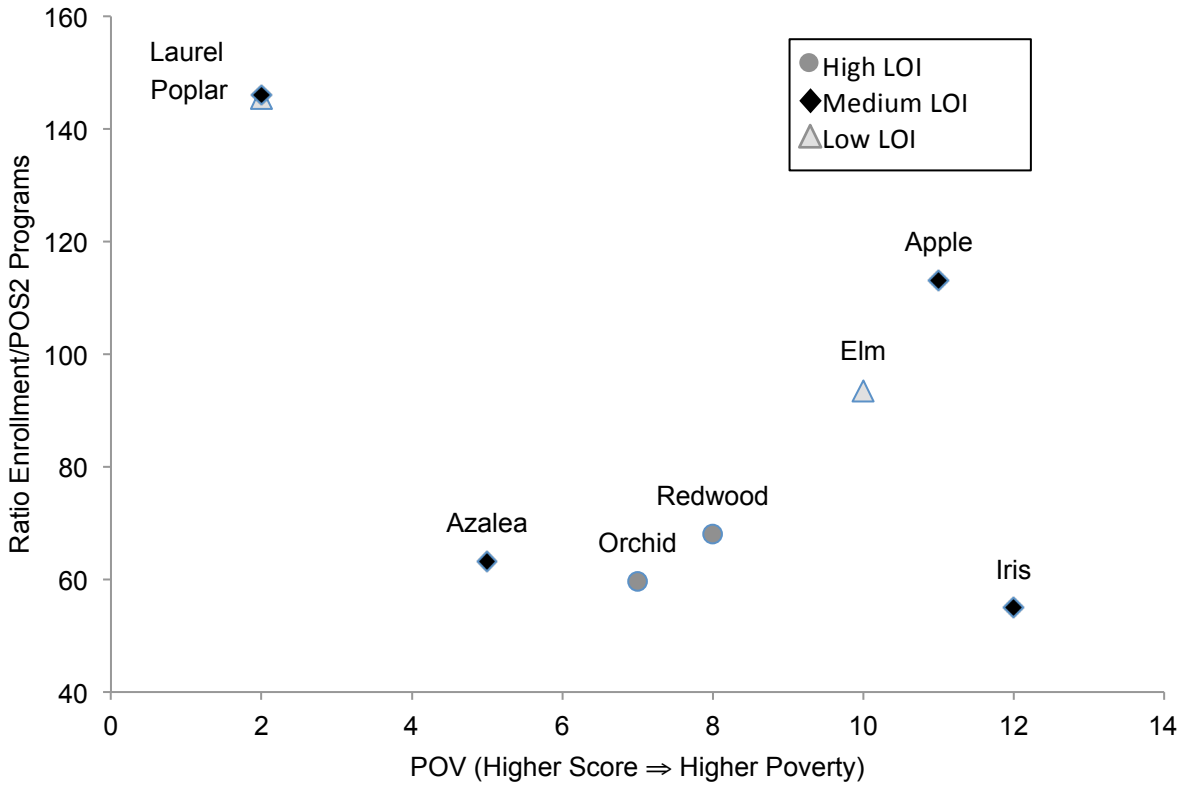

FIGURE 2.22. Ratio of school enrollment to POS2 programs, 2009-2011, by POV, with LOI noted.

Again, Figure 2.23 illustrates that the highest poverty schools (Iris, Elm, and Apple--and Redwood would be 4th in order of POV) have similar percentages of POS2 completers, but the POS2 program offerings ratios vary, with Apple having the fewest programs related to school enrollment (120 students are enrolled at Apple High for each POS2 program offered) in that group. One explanation for this is that Apple High is the most remotely located school in our sample. It is extremely difficult for the students at Apple High to make arrangements to go off campus for CTE programs. The school is also small and so the capacity to offer programs is limited.

The Moderate-POV schools (Azalea and Orchid—Redwood would be on the low end of Moderate) appear to offer a similar percentage of POS2 programs compared to their enrollment, but the percentage of POS2 completers varies. If we bring LOI into this equation, we note that Redwood's LOI is 85.2; Orchid's is 84.6 (the two highest policy implementers) and Azalea's is 72.2. Thus, there could be some positive relationship between LOI and POS2 completers, when program offerings are controlled. Redwood heavily utilizes a career center, and although Orchid students have access to a career center, few students use it. Azalea High also has a career center associated with it, but the percentages of POS2 students and programs were lower for that

school. The guidance director at Azalea indicated to us when we first visited the school that he was thrilled to be learning more about what was offered at the career center and to be able to present those pathways to students with more knowledge about career options and appropriate curriculum. Apparently, in previous years guidance counselors at that school had not had as much opportunity to learn about the curriculum at the career center and that may have been the case for students as well.

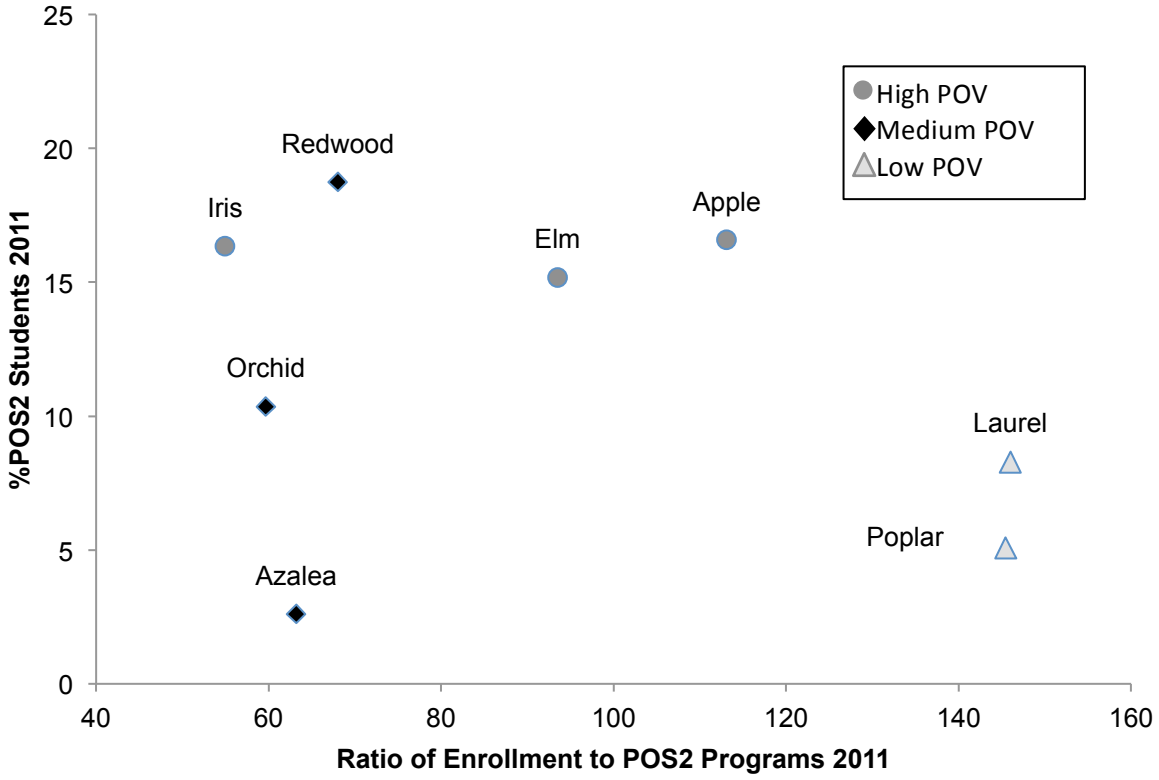

FIGURE 2.23. 2010-2011 percentage of POS2 completers by the ratio of average school enrollment to POS2 programs, with community poverty index (POV) noted.

Using students' responses on The *Student Engagement/POS Experiences Survey* to a question about the number of CTE courses taken, students were categorized into two POS3 categories: those who reported having taken three or more CTE courses and those who reported having taken none or one to two CTE courses. Those taking three or more CTE courses were identified as POS3 students. Only the surveys of the seniors (Class of 2009 and Class of 2011) are relevant for this analysis because few sophomores at most schools would have not had a chance to have taken three or more CTE courses. Looking at the POS3 percentages at schools, we see that POV is also a factor related to percentages of students who self-report that they have taken three or more CTE courses by last semester of their senior year. Figure 2.24 shows a slightly positive relationship between POV and the percentage of POS3 students in the Class of 2011 as seniors student survey cohort.

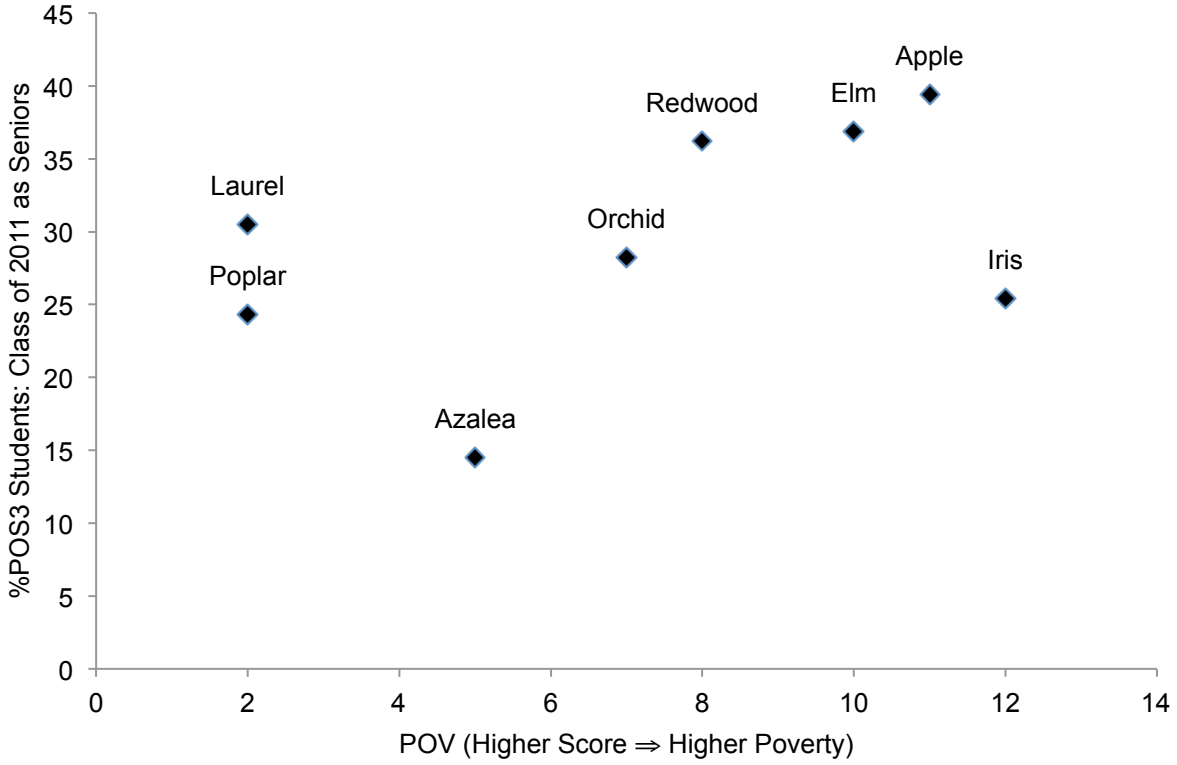

FIGURE 2.24. Percentages of students who self-reported that they had been in three or more CTE courses (POS3 students)--seniors from the Class of 2011, by school, by POV.

Considering differences between the *Student Engagement/POS Experiences Survey* responses to the question about the number of CTE courses taken, for the two senior cohorts (Class of 2009 and Class of 2011 as seniors), we can examine the relationship between POV and changes in students' CTE courses taking. As seen in Figure 2.25, the schools in the least disadvantaged communities (Poplar and Laurel) showed increases in the percentages of high school twelfth graders who reported having taken three of more CTE classes (POS3 students). Including Iris as the other school with fairly large increases in percentages of POS3 students, those three schools had the lowest percentages in 2009, so perhaps the fact that they were lower to begin with accounts for some of the increase between the years. Both Azalea and Redwood have students who take classes off campus at career centers. The *Student Engagement/POS Experiences Survey* for either or both administrations could have undersampled or oversampled CTE students, depending on whether CTE students were more likely to be on the main campuses or away at the career centers when the surveys were given at these two schools. Also, another factor that could have affected the student cohorts is that although waiting to survey seniors was considered the best solution to give students enough time to have taken more CTE classes or completed POS, often twelfth graders are not on campus as much during their final year of school. This, too, could have contributed to under or oversampling of certain students.

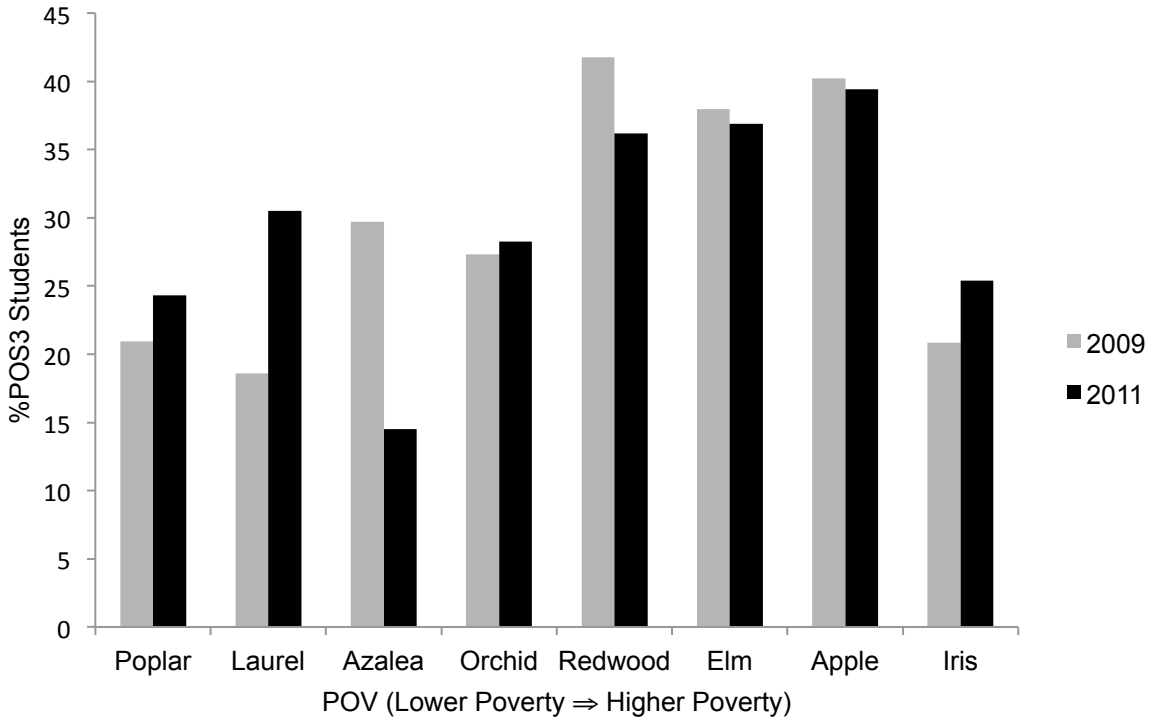

FIGURE 2.25. Percentages of students who self-reported that they had been in three or more CTE courses (POS3 students), classes of 2009 and 2011 seniors, by school. (Schools arranged on chart, left to right, less POV to higher POV.)

The response rates for the student surveys of the classes of 2009 and 2011 as seniors are shown in Table 2.27. Redwood had a much lower response rate for 2009 compared to 2011. Azalea's was more consistent between the two years, but because it is a smaller school, the drop from 76% in 2009 to 63% in 2011 is noteworthy. Both Poplar and Laurel had low response rates for both years; however, those schools do not have career centers so the students missed were possibly more mixed regarding CTE concentration.

Impacts of EEDA and Perkins IV Implementation

Our third research question asked: "What impact does the implementation of EEDA and the POS required by Perkins IV have on student high school outcomes and postgraduation preparation and plans?" Some of the findings related to this research question have been presented, others are discussed in Part II, and some observations related to POV are presented here.

Student Outcomes and POV

Community economic conditions seem to be significant when students were asked three questions regarding having a high school major and career cluster. The *Student Engagement/POS Experiences Survey* asked if having a high school major and career cluster "made me more likely to want to come to school." Across all three groups of survey respondents (Class of 2009 as seniors, Class of 2011 as sophomores, and Class of 2009 as seniors), greater percentages of

students in higher poverty schools agreed or strongly agreed with that statement and more students in lower poverty schools disagreed or strongly disagreed.

Table 2.27
Response Rates from the Student Engagement/POS Experiences Survey of the Classes of 2009 and 2011 as Seniors

School	Senior Class of 2009 Response Rate [a, b, c]	Senior Class of 2011 Response Rate [a, b, c]
Redwood	0.38	0.65
Azalea	0.76	0.63
Apple	1.07[d]	1.17 [d]
Elm	0.72	0.72
Iris	0.62	0.79
Laurel	0.24	0.25
Orchid	0.99	0.72
Poplar	0.42	0.25
TOTAL	0.57	0.51

[a] The response rate was determined by a ratio of the number of surveys returned where respondents reported they were in the grade level appropriate for their class compared to the student headcount of enrollment in that class for the time period closest to survey administration (e.g., 135-day headcount for the Spring survey administrations and 45-day headcount for the Fall administration). [b] Sources of headcount data: 135-day headcount of twelfth graders, March 2009, South Carolina Department of Education; 45-day headcount of eleventh graders, November 2009, South Carolina Department of Education; 135 day headcount of twelfth graders, March 2011, South Carolina Department of Education. [c] Student surveys that appeared patterned were not included. [d] The response rates for Apple High senior classes was greater than one for both years because in 2009, 11 of those graduating were registered that year as eleventh graders and were included in survey administration. Although these students were instructed to report their grade as eleventh and not twelfth, a number of them reported twelfth as their grade level. And in 2011, 10% of respondents were eleventh, tenth, and ninth graders.

When asked if having a high school major and career cluster "made me less likely to want to drop out of school," more students at high poverty schools both strongly agreed and strongly disagreed with that statement though more strongly agreed than strongly disagreed, and more agreed than disagreed (Table 2.28). Greater percentages of students at moderate poverty schools agreed, but fewer strongly agreed. Greater percentages of students at Low poverty schools disagreed, but didn't indicate that they strongly disagreed.

When asked if having a high school major and career cluster "helped me get better grades," the higher the community poverty, the more students agreed or strongly agreed with that statement (Table 2.29).

More specifically, for Class of 2011 survey respondents, significant differences existed for four of the six statements in the level of agreement among seniors who reported having a high school major and career cluster in the Class of 2011 at High, Moderate, and Low poverty schools. Fewer seniors in the Class of 2011 reporting that they had a high school major and career cluster in the Low poverty schools agreed that they were more likely to want to come to school (54.9%) than seniors in the

Table 2.28
Student Survey Question: "How Much Do you Agree or Disagree with the Following Statement: Having a High School Major and Career Cluster has Made me Less Likely to Want to Drop out of High School"

	Percentage of respondents	Senior Class of 2009 (N = 577) % (N)	Sophomore Class of 2011 (N = 960) % (N)	Senior Class of 2011 (N = 561) % (N)
High Poverty (N = 676)	Strongly Agree	29.3 (60)	33.0 (86)	26.2 (55)
	Agree	34.6 (71)	32.6 (85)	40.0 (84)
	Disagree	17.6 (36)	14.6 (38)	12.9 (27)
	Strongly Disagree	18.5 (38)	19.9 (52)	21.0 (44)
	Total	100.0 (205)	100.00 (261)	100.0 (210)
Moderate Poverty (N = 708)	Strongly Agree	30.4 (66)	33.0 (90)	25.2 (55)
	Agree	39.2 (85)	40.7 (111)	47.7 (104)
	Disagree	14.3 (31)	14.7 (40)	8.3 (18)
	Strongly Disagree	16.1 (35)	11.7 (32)	18.8 (41)
	Total	100.0 (217)	100.0 (273)	100.0 (218)
Low Poverty (N = 714)	Strongly Agree	15.5 (24)	25.1 (107)	21.1 (28)
	Agree	34.8 (54)	40.4 (172)	40.6 (54)
	Disagree	34.8 (54)	19.7 (84)	24.1 (32)
	Strongly Disagree	14.8 (23)	14.8 (63)	14.3 (19)
	Total	100.0 (155)	100.0 (426)	100.0 (133)

Note. Does not include multiple responses, missing responses, or not applicable responses.

Moderate poverty schools (72.9%) and High poverty schools (73.0%; p = 0.004). Approximately 72.9% of seniors in the Class of 2011 from Moderate poverty schools agreed that they were less likely to want to drop out of school, compared to 66.2% from High Poverty schools and 61.7% from Low poverty schools (p = 0.003). A majority of seniors in the Class of 2011 from High, Moderate, and Low poverty schools agreed that having a high school major and career cluster helped them to get better grades (75.2%, 74.8%, and 59.5%, respectively; p = 0.008). Similar proportions of seniors in the Class of 2011 from High, Moderate, and Low Poverty schools agreed that having a high school major helped to make connections between what is studied and the type of career students want (86.0%, 89.9%, and 80.3%, respectively) and made it more likely that they would take courses needed for the future (90.0%, 89.9%, 82.0%, respectively). Fewer seniors in the Class of 2011 from Low poverty schools (51.9%) agreed that having a high school major and career cluster made it more likely that their parents got involved in the selection of courses than High and Moderate poverty schools (71.4% and 64.7%, respectively; p = 0.029). Seniors in the Class of 2011 from High, Moderate, and Low poverty schools did not have significantly different agreement about teachers making the subject matter interesting and useful (71.2%, 69.6%, and 71.7%, respectively) or about teachers making connections between what they are teaching and how it applies in the real world (73.8%, 71.6%, and 70.1%, respectively).

Table 2.29
Student Survey Question: "How Much Do You Agree or Disagree with the Following Statement: Having a High School Major and Career Cluster has Helped Me Get Better Grades"

	Response	Senior Class of 2009 (*N* = 574) % (*N*)	Sophomore Class of 2011 (*N* = 954) % (*N*)	Senior Class of 2011 (*N* = 559) % (*N*)
High Poverty (*N* = 675)	Strongly Agree	16.7 (34)	15.7 (41)	17.1 (36)
	Agree	60.8 (124)	60.5 (158)	58.1 (122)
	Disagree	17.7 (36)	21.1 (55)	19.5 (41)
	Strongly Disagree	4.9 (10)	2.7 (7)	5.2 (11)
	Total	100.0 (204)	100.0 (261)	100.0 (210)
Moderate Poverty (*N* = 703)	Strongly Agree	21.5 (46)	18.5 (50)	12.8 (28)
	Agree	57.0 (122)	53.5 (145)	61.9 (135)
	Disagree	15.9 (34)	26.2 (71)	19.7 (43)
	Strongly Disagree	5.6 (12)	1.9 (5)	5.5 (12)
	Total	100.0 (214)	100.0 (271)	100.0 (218)
Low Poverty (*N* = 709)	Strongly Agree	3.2 (5)	11.4 (48)	6.9 (9)
	Agree	42.3 (66)	48.8 (206)	52.7 (69)
	Disagree	39.7 (62)	32.7 (138)	29.0 (38)
	Strongly Disagree	14.7 (23)	7.1 (30)	11.5 (15)
	Total	100.0 (156)	100.0 (422)	100.0 (131)

Note. Does not include multiple responses, missing responses, or not applicable responses.

With regard to the SLDS data, data on Cohort 2011 students who had completed four-course CTE sequences (Cohort 2011 POS1 students) were analyzed to see if these students were enrolling in and completing AP, IB or dual credit courses. POS1 students were less likely to take any AP/IB courses, and for students who do take at least one advanced academics course, POS1 students earn fewer than half as many credits in these courses as non-POS1 students.

Cohort 2011 POS1 students were, however, much more likely to take dual credit courses. Among students who took dual credit courses, the average number of credits earned was approximately the same for POS1 and non-POS1 students.

The eight sample schools provide a great deal of variation in AP/IB taking patterns among Cohort 2011 POS1 students, but not so much for non-POS1 students. For non-POS1 students, the schools are fairly similar, with 25 to 35 percent earning at least one credit in an AP or IB course. The exception is Iris High (the school in our sample with the highest community poverty level), where there are no students (POS1 or non-POS1) who are reported to have taken an AP or IB course. With regard to POS1 students, there is greater variation across schools. Four of the sample schools have no POS1 students who completed a credit in an AP or IB course, whereas three of the schools have more than 15% of POS1 students taking AP or IB courses. The percentage of POS1 students (middle column of data in Table 2.30) taking AP/IB courses does not appear to be related to poverty level, as the schools with more than 15% of POS1 students in AP/IB include one High-poverty school (Apple), one Low-poverty school (Laurel), and one

school with Moderate poverty levels (Orchid). As a reminder, for POS1 calculations, the student cohorts were defined as students who had been at the school three consecutive years (tenth, eleventh, and twelfth grades) at least ten days per year. POS1 students were identified as having earned 4 CTE credits in a logical sequence of at least 3 courses within a single career cluster.

Table 2.30
Percentage of Cohort 2011 POS1 and Non-POS1 Students Taking AP/IB, by School, ordered from Less POV to More POV (POV is equal for Poplar and Laurel)

	Non-POS1 Students (Percent)	POS1 Students (Percent)	Percent Difference
Laurel	29.7	18.6	-11.1*
Poplar	35.4	0.0	-35.4**
Azalea	26.5	0.0	-26.5**
Orchid	25.0	23.3	-1.7
Redwood	26.3	4.5	-21.8**
Elm	28.0	0.0	-28.0**
Apple	32.7	15.4	-17.3*
Iris	NA	NA	NA
Total	27.6	8.6	-19.0**

Note. Numbers of POS1 students at Poplar and Azalea are fewer than 10 each. * $p < 0.05$. ** $p < 0.01$.

Table 2.31 provides the school-level data for dual credit course-taking by POS1 and non-POS1 students, again ordered from lowest POV to highest POV. At three of the eight schools, fewer than 1% of students enrolled in dual credit. Among the four schools with more substantial dual credit enrollment (Laurel, Redwood, Elm and Iris), there is significant variation; the percentage of students taking dual credit ranges from about 5% to 40%. Dual credit course-taking, however, does not appear to differ by poverty level or economic resources. The four schools with most dual credit course-taking have High, Moderate, and Low poverty levels. The three schools with less than 1% SLDS Cohort 2011 students taking dual credit are Low, Moderate and High POV schools.

Students' perceptions of the relationship between having a major and career cluster in high school and parental involvement in the selection of courses seem to be correlated to some degree with community poverty conditions. Students were asked on the *Student Engagement/POS Experiences Survey* if having a high school major or career cluster "made it more likely that my parents got involved in my selection of courses." A greater percentage of students at higher poverty schools agreed or strongly agreed with that statement. Site visit interviews with counselors indicated that this might have been the case for some of their students. The schools in some of the most economically challenged areas were seeing more parental participation due in particular to IGP conferences. However, some did mention economic hardships for parents in attending meetings (transportation, taking off work, etc.).

Table 2.31
Percentage of SLDS Cohort 2011 POS1 and Non-POS1 Students Taking Dual Credit, by School, ordered from Less POV to More POV (POV is equal for Poplar and Laurel)

	Non-POS1 Students (Percent)	POS1 Students (Percent)	Percent Difference
Laurel	8.9	11.6	2.8
Poplar	0.6	0.0	-0.6
Azalea	4.1	0.0	-4.1*
Orchid	0.5	0.0	-0.5
Redwood	39.8	40.9	1.1
Elm	17.8	5.4	-12.3*
Apple	0.0	0.0	0.0
Iris	11.2	25.0	13.8*
Total	8.9	16.0	7.1**

Note. The numbers of POS1 students at Poplar and Azalea are fewer than 10 each. * $p < 0.05$. ** $p < 0.01$.

Senior respondents to the Student Engagement/POS Experiences Survey, Class of 2011, from High and Moderate poverty schools had higher agreement with the statement that most of the information learned in school is useful in everyday life (69.1% and 56.5%, respectively) than in seniors in the Class of 2011 from Low poverty schools (46.1%; $p < 0.001$). Agreement to the statement that most of the information learned in school will be useful for college or further training among seniors in the Class of 2011 from High, Moderate, and Low poverty schools did not significantly differ with a majority agreeing or strongly agreeing (85.7%, 81.8%, and 81.5%, respectively; $p = 0.460$). Seniors in the Class of 2011 from High poverty schools had higher agreement with the statement that most of the information learned in school will be useful for a career (78.0%) than in seniors in the Class of 2011 from Moderate and Low poverty schools (61.1% and 56.6%, respectively; $p < 0.001$). The distribution of responses from seniors in the Class of 2011 regarding the number of times they were late for school significantly differed, with fewer seniors from High and Moderate poverty schools indicating they had never been late for school (20.9% and 18.6%, respectively) than seniors in the Class of 2011 from Low poverty schools (27.5%; $p = 0.015$). The distribution of responses from seniors in the Class of 2011 regarding the number of times they cut or skipped classes also significantly differed, with more seniors from High poverty schools indicating they had never cut or skipped classes (64.2%) than seniors in the Class of 2011 from Moderate and Low poverty schools (55.3% and 46.9%, respectively; $p < 0.001$). Slightly more seniors in the Class of 2011 from High and Moderate poverty schools reported that they were never absent from school (10.5%) than seniors in the Class of 2011 from Low poverty schools (6.6%, respectively; $p = 0.053$). The distribution of responses from seniors in the Class of 2011 regarding the number of times they went to class without homework significantly differed, with fewer seniors from Low poverty schools indicating they never went to class without homework finished (14.0%) than seniors in the Class of 2011 from High and Moderate poverty schools (26.4% and 18.7%, respectively; $p < 0.001$). A majority of seniors in the Class of 2011 from High, Moderate, and Low poverty schools

indicated they had gone to class without a pencil, paper, book, or other necessary supplies one or more times (55.9%, 58.8%, and 58.1%, respectively).

Several questions in the survey were geared toward discovering more details about student participation in activities to help them identify jobs or careers that may interest them. As outlined in Table 2.32, a majority of seniors in the Class of 2011 from High, Moderate, and Low poverty schools reported answering job- and career-related questions on a computer or filling out a questionnaire, researching different jobs and careers, researching different colleges, universities, or military branches, speaking with or visiting someone in a career that interests them, and being in a class where someone from a local business talked about working at their company or in their career. More seniors in the Class of 201 from Moderate and Low poverty schools reported researching different colleges, universities, military branches or technical/community colleges (91.1% and 89.8%, respectively) than seniors in the Class of 2011 from High poverty schools (83.9%; $p = 0.011$). Higher percentages of seniors in the Class of 2011 from Moderate poverty schools reported being in a class where someone from a local business talked about working at their company or in their career (76.4%) than from High and Low poverty schools (66.3% and 59.4%, respectively; $p < 0.001$). More seniors in the Class of 2011 from High and Moderate poverty reported touring a local business with a group from school (40.8% and 43.0%) than from Low poverty schools (25.6%; $p < 0.001$).

Table 2.32
Percentage of Seniors in the Class of 2011 Reporting Participation in Job or Career Identification Activities

Job or /Career Identification Activities	High Poverty Yes (%)	Moderate Poverty Yes (%)	Low Poverty Yes (%)
Answered questions related to jobs and careers on a computer or filled out a questionnaire.	82.6	83.0	86.6
Researched different jobs or careers.	86.0	86.8	88.0
Researched different colleges, universities, military branches or technical/community colleges.*	83.9	91.1	89.8
Spoke with or visited someone in a career that interests me.	65.9	71.0	70.4
Been in a class where someone from a local business talked about working at their company or in their career.**	66.3	76.4	59.4
Toured a local business with a group from my school.**	40.8	43.0	25.6

Note. Responses are from the *Student Engagement/POS Experiences Survey* administered to members of the Class of 2011at the eight sample schools in the Spring of 2011. *$p < .05$, **$p < .01$ (based on Chi-square analysis).

Students were asked about how much thinking and planning they had done for job-related activities. The students classified how much thinking and planning they had done into four categories: (1) I have not thought about or done this; (2) I have thought about doing this; (3) I have made plans to do this; and (4) I have already done this. There were no significant

differences in the responses of seniors in the Class of 2011 from High, Moderate, and Low poverty school regarding their thinking and planning on gathering information about jobs of interest, taking classes to help decide what kind of job they want, participating in school or out-of-school activities that will help in the decision about the kind of job wanted, and volunteering, interning, or working on a job to help find out the kind of job wanted in the future.

Students also reported whether or not they participated in work-based learning (WBL) experiences. The most reported work-based learning experiences were job shadowing or work-site visits and community service and the least reported experiences were co-ops and school-based enterprise. Table 2.33 summarizes the work-based learning experiences of seniors in the Class of 2011 from High, Moderate, and Low poverty schools. More seniors in the Class of 2011 from Low poverty schools indicated they had participated in an internship (29.0%) than seniors in the Class of 2011 from High and Moderate poverty schools (19.9% and 17.9%, respectively; $p = 0.004$). Fewer seniors in the Class of 2011 from Moderate poverty schools indicated they had participated in mentoring (12.2%) than seniors in the Class of 2011 from High and Low poverty schools (24.2% and 17.9%, respectively; $p = 0.002$). There were not significant differences in the proportions of seniors in the Class of 2011 from High, Moderate, and Low poverty schools who participated in co-ops, job shadowing or work-site visits, community service, or school-based enterprise. Similar percentages of seniors in the Class of 2011 from High, Moderate, and Low poverty schools indicated they had not participated in any of the work-based learning experiences provided (19.9%, 20.5%, and 23.2%, respectively).

Table 2.33
Percentage of Seniors in the Class of 2011 Reporting Participation in Work-Based Learning Experiences

Work-Based Learning Experiences	High poverty Yes (%)	Moderate poverty Yes (%)	Low poverty Yes (%)
Internship (work experience, but not necessarily part of a vocational, career, or technical class)**	19.9	17.9	29.0
Co-op (work experience at a local business in your high school major or career cluster)	11.0	9.2	8.0
Job shadowing or work-site visits (visits to work places to observe one worker or many workers)*	58.2	51.7	50.5
Mentoring (a match with an adult in your career area for advice and support)**	11.0	28.6	17.9
Community service (volunteer work to support your local community)	35.1	38.1	43.3
School-based enterprise (working in a business run by students or teachers from your school)	13.8	11.8	8.5
None of these	19.9	20.5	23.2

Note. Responses are from the *Student Engagement/POS Experiences Survey* administered to members of the Class of 2011 at the eight sample schools in the Spring of 2011. *$p < .05$, **$p < .01$ (based on Chi-square analysis).

Seniors in the Class of 2011 from High, Moderate, and Low poverty schools significantly differed in their responses to the number of courses they plan to take that will earn college credit

by the time they graduate from high school, with more seniors in the Class of 2011 from Low poverty schools indicating they would take none of these courses (28.0%) than seniors in the Class of 2011 from High and Moderate poverty schools (11.7% and 17.5%, respectively; $p < 0.001$). More seniors in the Class of 2011 from High and Low poverty schools indicated they had never taken an Advanced Placement course (49.3% and 53.2%, respectively) compared to seniors in the Class of 2011 from Moderate poverty schools (40.6%; $p = 0.016$). There were not significantly different responses among seniors in the Class of 2011 from High, Moderate, and Low poverty schools regarding the number of times they had taken vocational, career, or technical courses with a majority indicating they had taken one or more of these courses, as well as special education courses with a majority indicating they had never taken these courses. Seniors in the Class of 2011 were also asked how many vocational, career, or technical units they would have earned in their primary vocational, career, and technical program area; the distribution of responses to the number of units earned did not significantly differ among seniors in the Class of 2011 from High, Moderate, and Low poverty schools, with a majority in each level of poverty indicating they would take at least one unit or credit by the time they graduate from high school.

Seniors in the Class of 2011 from High, Moderate, and Low poverty schools significantly differed in their responses regarding the highest level of education they expect to complete with more seniors from Low poverty schools indicating they expected to complete at least a bachelor's degree (84.5%) than seniors from High and Moderate poverty schools (57.7% and 64.7%, respectively; $p < 0.001$). A majority of seniors in the Class of 2011 from High, Moderate, and Low poverty schools indicated their intention to enroll in a 4-year college or university, enroll in a 2-year community college, or transfer to a 4-year college or university the year after graduation (75.5%, 77%, and 83.3%, respectively), although the responses did not significantly differ. Seniors in the Class of 2011 from High, Moderate, and Low poverty schools regarding their plan to have a job at age 30 had similar responses, with a majority indicating they planned to have a job at age 30 and providing a legitimate job name (68.6%, 70.0%, and 70.1%, respectively).

Graduation Rates

In 2004, lacking a common measure to compare high school graduation rates across the country, Balfanz and Legters (2004) used a calculation called "promoting power" as an indirect measure of graduation rate. The formula was simply a comparison of the first year enrollment (either ninth or tenth grade, depending on the grade span of the high school) to the senior class enrollment. Balfanz and Legters found that more than two thirds of all of the high schools in the nation with the lowest promoting power (50% or less) were located in just 11 states. South Carolina was one of those 11 states. Five states led the nation in both total number and level of concentration of high schools with weak promoting power. South Carolina was one of those five states.

The Balfanz and Legters' 2004 report looked at the Class of 2002 seniors. In the most recent annual update to that 2004 report, data from the Class of 2009 were available. In the more recent report, Balfanz, Bridgeland, Bruce and Fox (2012) list South Carolina as a state leader in improving high school graduation rates. Between 2002 and 2009, slightly more than half of the

states across the United States made limited or no progress or even experienced declines in their graduation rates. Twelve states accounted for most of the gains in the national graduation rate. South Carolina was one of them. South Carolina was listed as the state making the third largest increase in graduation rates between 2002 and 2009 (8.1 percentage points, from 57.9% to 66%). The term Adjusted Cohort Graduation Rate (ACGR) was used in this 2012 report as well as "promoting power." Although South Carolina has been using the 2008 federal ACGR formula for graduation rate for several years, ACGRs were not available for all states for the 2012 report, so both figures were used, as appropriate. The 66% figure for 2009 was reported to be the ACGR for South Carolina for that year's cohort.

South Carolina's statewide report card for 2009 reports the statewide graduation rate to be 73.7%. As of 2007-2008, South Carolina's graduation rate formula did not match the federal formula because of an exception for students with disabilities (Alliance for Excellent Education, 2008). For 2009, even if the formula complied with the federal ACGR formula, the data going in to the formula could have been different due to the treatment of transfers in and out of schools and true dropouts within the formulas. Caution should be taken when comparing graduation rates from year to year as not only formulas but also data collection methods and sophistication of definitions and metrics have changed. Regardless of the method used, however, both Balfanz et al. (2012) and the state report cards indicate that there has been much improvement in promoting power or graduation rates in South Carolina over the last decade.

EdCounts publishes a national comparison of graduate rates called Cumulative Promotion Index (CPI). Currently data are available only through 2009. As shown in Figure 2.26, South Carolina has consistently been below the national average in graduate rates, although the increases since 2002 are obvious.

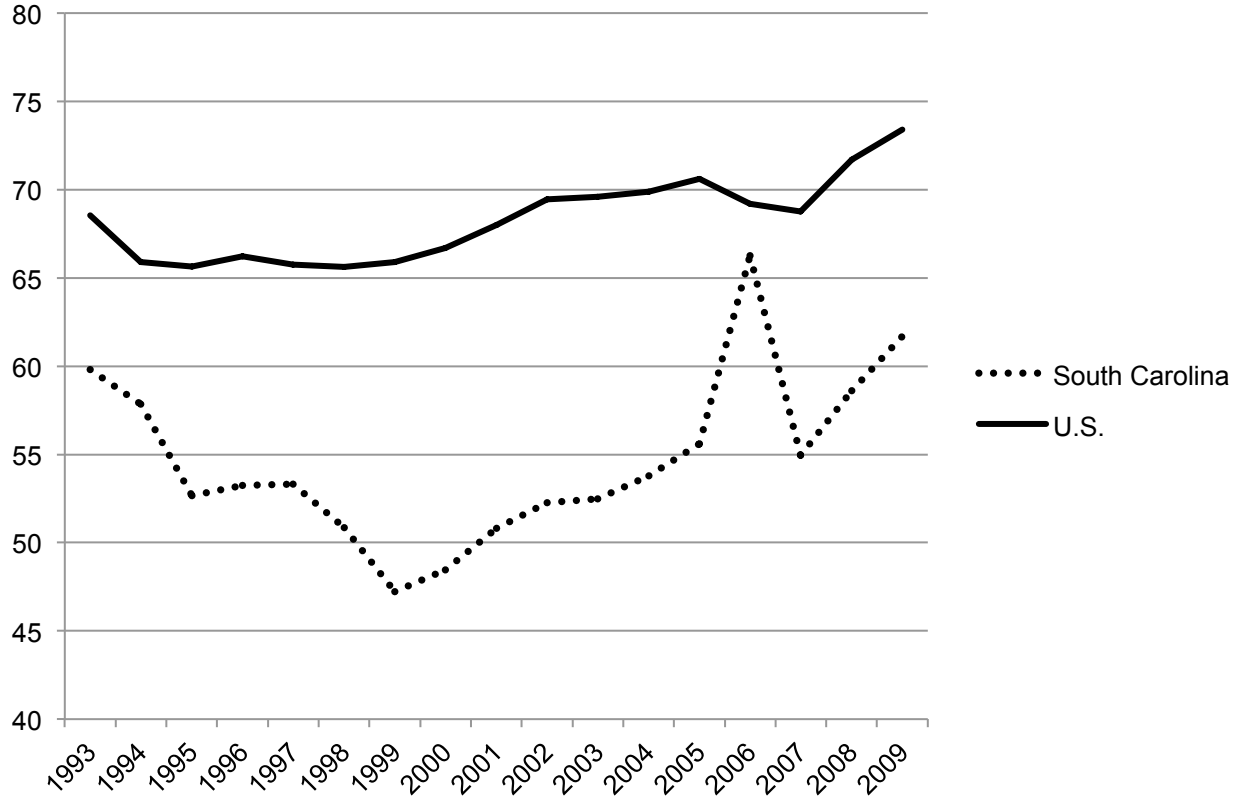

FIGURE 2.26. United States and South Carolina (statewide) graduation rate, cumulative promotion index (CPI). *Source*: http://www.edcounts.org/createtable/viewtable.php. Note that the spike in SC's data for 2006 may have been due to the fact that the state did not submit graduation data to the USDOE for 2006 and therefore estimates had to be used.

Starting with rates in 2009 from state report card data, comparisons can be made between averages of the eight sample schools to the statewide averages for four-year graduation rates. The data presented in Figure 2.27 averages the four-year graduation rates reported in the report cards over three years: 2009, 2010, and 2011. On average, the sample schools have slightly higher graduation rates when compared to the state's 73%, but some schools are lower than the state average and some are much higher. In all, our schools represent a spectrum of success with graduation rates and are representative of the state as a whole.

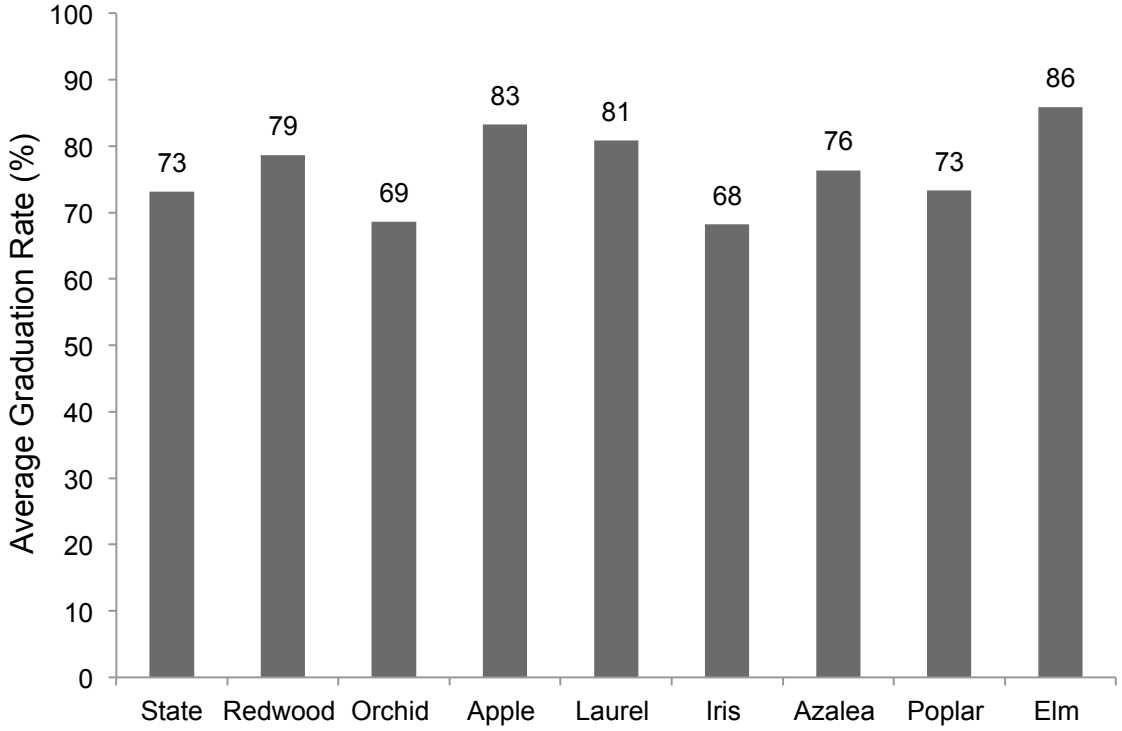

FIGURE 2.27. Average four-year graduation rates, averaged over three years (2009, 2010, and 2011), state and eight sample schools. *Source:* South Carolina Report Cards, 2009, 2010, and 2011.

For the remainder of this section, state report card data presenting four-year graduation rates will be used for consistency.

School level annual graduation rates fluctuate a great deal from year to year. All schools do not experience improvement or decline to the same degree or even in the same direction from year to year. Presenting the data through smoothed trend lines presents a simpler and clearer view of change over time, but the fact that there are dramatic fluctuations from year to year should not be lost. In other words, caution should be exercised when looking at a short time frame because a large increase or decrease in one year, for whatever reason, can lead to misinterpretations of trends.

Figure 2.28 presents the trends in four-year graduation rates between the classes of 2006 through 2011 for each sample school. Vertical bars have been added to show the first year that eighth graders were required by the EEDA policy to have IGPs and IGP meetings and the year in which these "EEDA babies" (term used by some state data staff to refer to Class of 2009 students) would have been expected to graduate if they took the four years. Overall downward trends in four-year graduation rates were found at four of the eight schools over this time period (Redwood, Iris, Azalea, and Poplar). Four schools (Orchid, Apple, Laurel, and Elm) showed overall slightly positive trends in four-year graduation rates, with Elm and Laurel experiencing the largest increases. As mentioned, a particularly high or particularly low graduation rate in any one year can make the interpretation of trends misleading. For example, Azalea experienced an outstanding graduation rate of 90% in one of the earlier years plotted. Over the time period

considered, Azalea's average graduation rate of 81% (which is still above the average of 77% for the eight sample schools) would present as a declining graduation rate from that high of 90%.

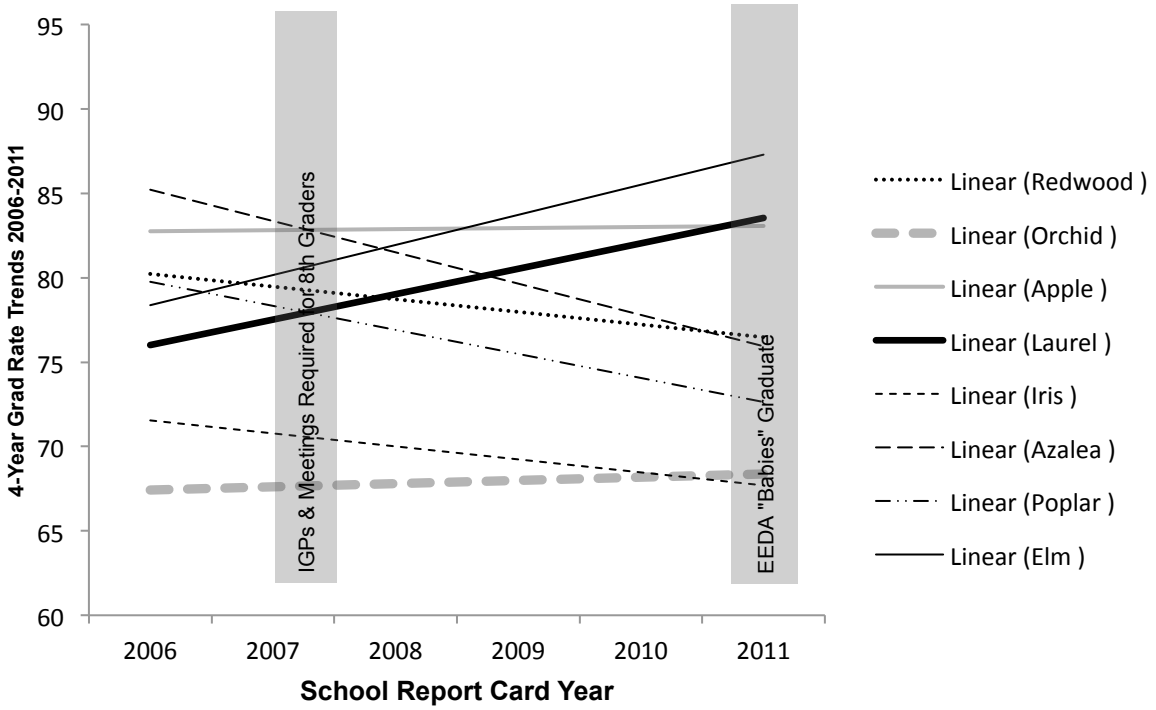

FIGURE 2.28. Trends in graduation rates, by school, by year, 2006-2011. *Note*: The data have been smoothed over the 2006-2011 time period and yearly fluctuations are not apparent.

Figure 2.29 highlights the trends for the most recent three years, which correspond to our study period (2009-2011). This time period includes graduation rates for the Class of 2009 (our control group with little exposure to the EEDA policy) and the Class of 2011 (our cohort with exposure to the policy since eighth grade, since 2006-2007). The trends in graduation rates between these years are for the most part positive. Only two schools (Redwood and Orchid) show negative trends over this period. However, even for those two schools, their average graduation rates were each one percentage point higher for the time period 2009-2011 compared to the entire period from 2006 to 2011. (Both of these schools experienced a high point in graduation rates in 2009 and thus show a negative trend from that point.)

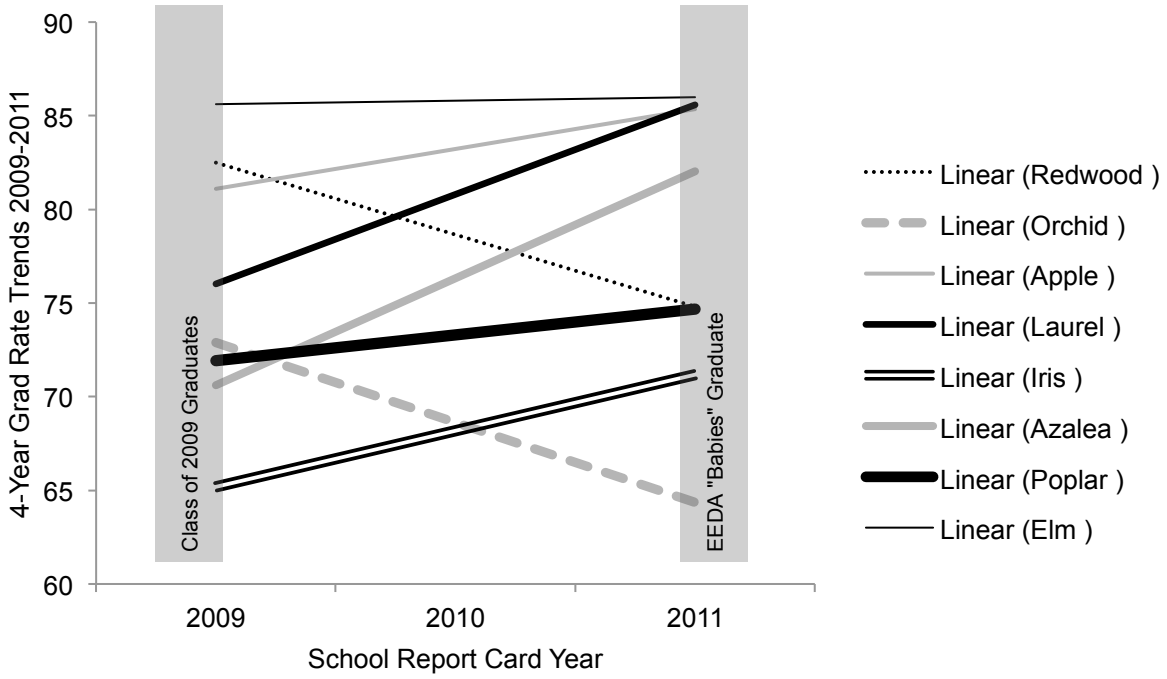

FIGURE 2.29. Trends in graduation rates, by school, by year, 2009-2011.

Although the graduation rates are trending upwards among the eight sample schools, the relationships between graduation rates and measures of policy implementation and POS are not so clear and may even be contrary to expectations. For example, looking at the average yearly difference between graduation rates at our schools between 2009 and 2011, compared to 2009 policy implementation at each school (LOI), there is a slightly negative relationship, indicating that, on average, higher LOI scores are associated with more negative change in graduation rates between 2009 and 2011. Figure 2.30 illustrates this. However the slightly negative relationship exists because of the two schools with the highest LOI (Redwood and Orchid). Recall that Redwood and Orchid both had a high point in graduation rates in 2009 and this accounts for most of the negative average change between 2009 and 2011 shown in the graph. Interestingly, without Redwood and Orchid, the graph would show a positive relationship between change in graduation rate and LOI. This illustrates the danger in looking at trends at the school level with an N of only eight. Therefore, the data will be presented in scatter plots and any slight relationships will be noted, but cause and effect should not be assumed.

Looking just at the graduation rates for the Class of 2011 by school compared to LOI, the relationship is also slightly negative as shown in Figure 2.31. However, again, caution is advised when interpreting these figures. A particularly high, or particularly low, graduation rate on either end of the time period, can result in a negative or positive change over time that can be misleading, and looking at only one year's data can also be misleading. The LOI score, too, is composed of many elements that may affect different populations in different ways.

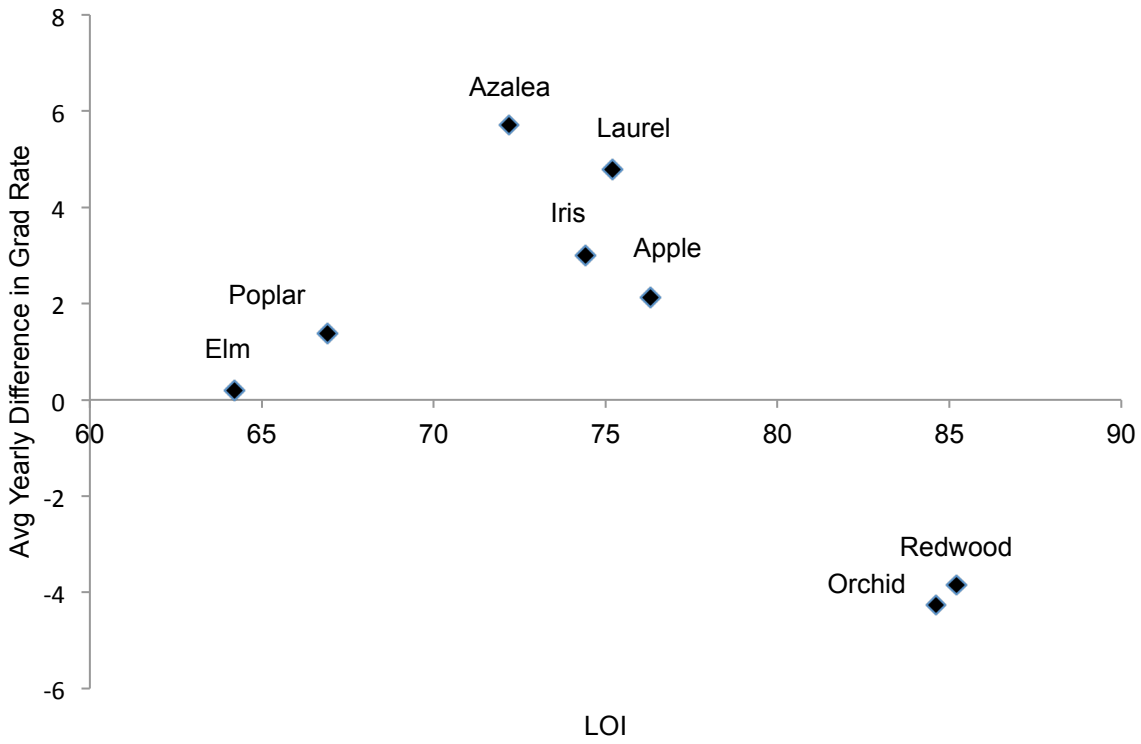

FIGURE 2.30. Average yearly difference in graduation rates 2009-2011 by school, compared to LOI by school.

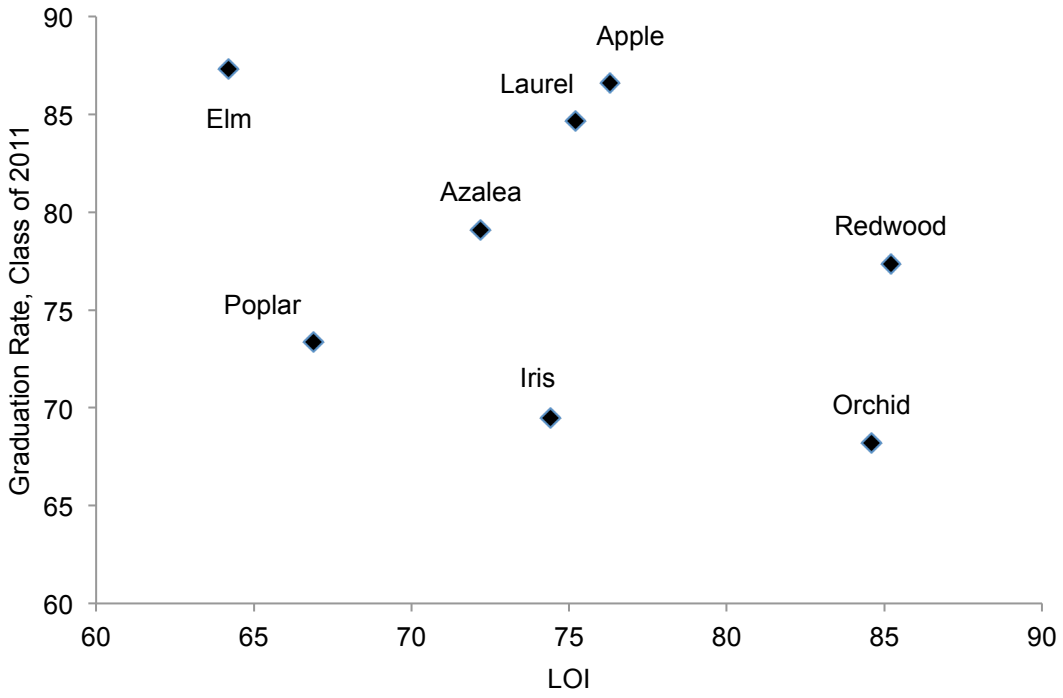

FIGURE 2.31. Graduation rates 2011 compared to LOI, by school.

In addition to these analyses, we also plotted the average yearly difference in graduation rates, 2009-2011, compared to our three most useful measures of CTE concentration: POS1 (from the SLDS data set), POS2 (from state reports of CTE concentrators at schools), and POS3 (from our *Student Engagement/POS Experiences Survey*). These figures are presented in Technical Appendix B. In reference to any POS students in these charts, the 2011 SLDS cohort, the Class of 2011 as seniors, and the 2010-2011 school year only are included. In each of the four charts, there is a slightly negative relationship between higher percentages of POS students and programs at schools and decreases in graduation rates. However, this varies widely from school to school.

In Appendix L, we also present a one-year snapshot of data plotting the Class of 2011 four-year graduation rates at the eight sample schools, compared to our three most useful measures of CTE concentration: POS1 (from the SLDS data set), POS2 (from state reports of CTE concentrators at schools), and POS3 (from our *Student Engagement/POS Experiences Survey*). Again, in reference to any POS students in these charts, the 2011 SLDS cohort, the Class of 2011 as seniors, and the 2010-2011 school year only are included. In each of these four charts there is a slightly positive relationship between the data on the x and y axes. This could be interpreted to mean that there could be a positive relationship between increased POS at a school and higher graduation rates (as of 2011). The third chart, however, contradicts this trend with its slightly positive relationship: fewer CTE program offerings are related to higher graduation rates. Again, these relationships are just slight and with an N or only 8, the main point is that there is variation among schools and some possible slight trends.

Finally, as we might expect, change in graduation rates between 2009-2011 appears to be loosely associated, , with local poverty; however, for our sample schools, more poverty is not always associated with a decrease in graduation rate as shown in Figure 2.32.

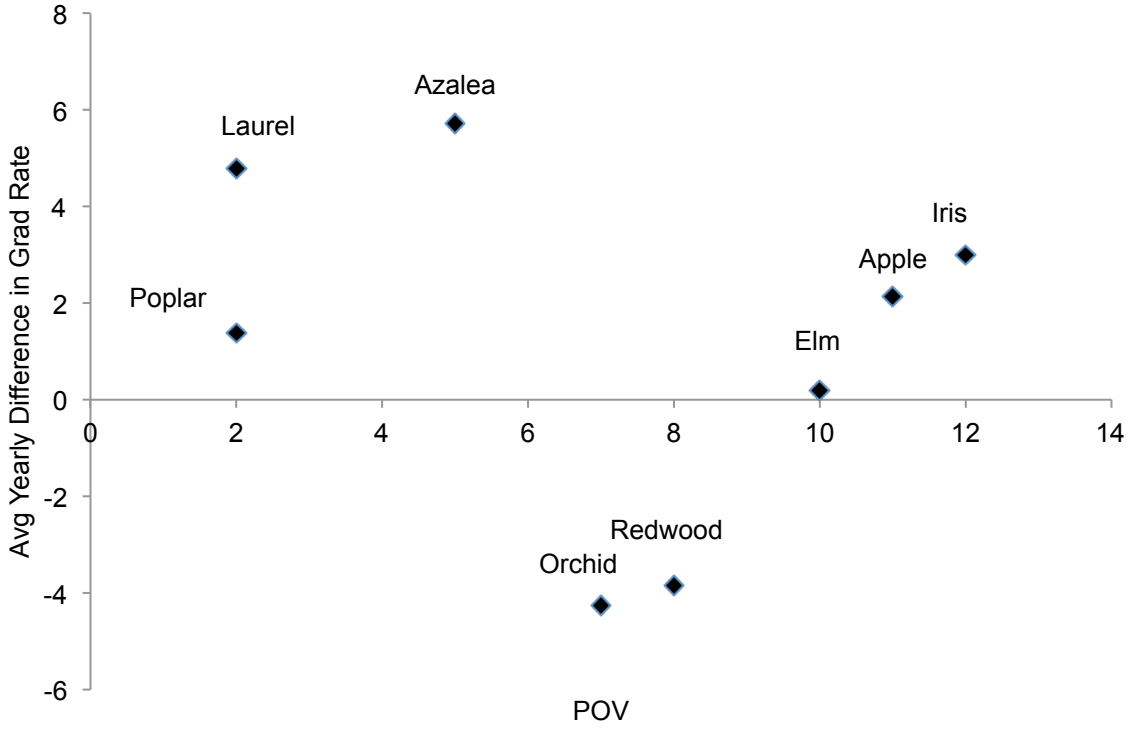

FIGURE 2.32. Average yearly difference in graduation rates 2009-2011 compared to POV.

Looking at the one-year snapshot of graduation rates at the schools for the Class of 2011 (Figure 2.33), however, there appears to be no relationship between local poverty and graduation rates.

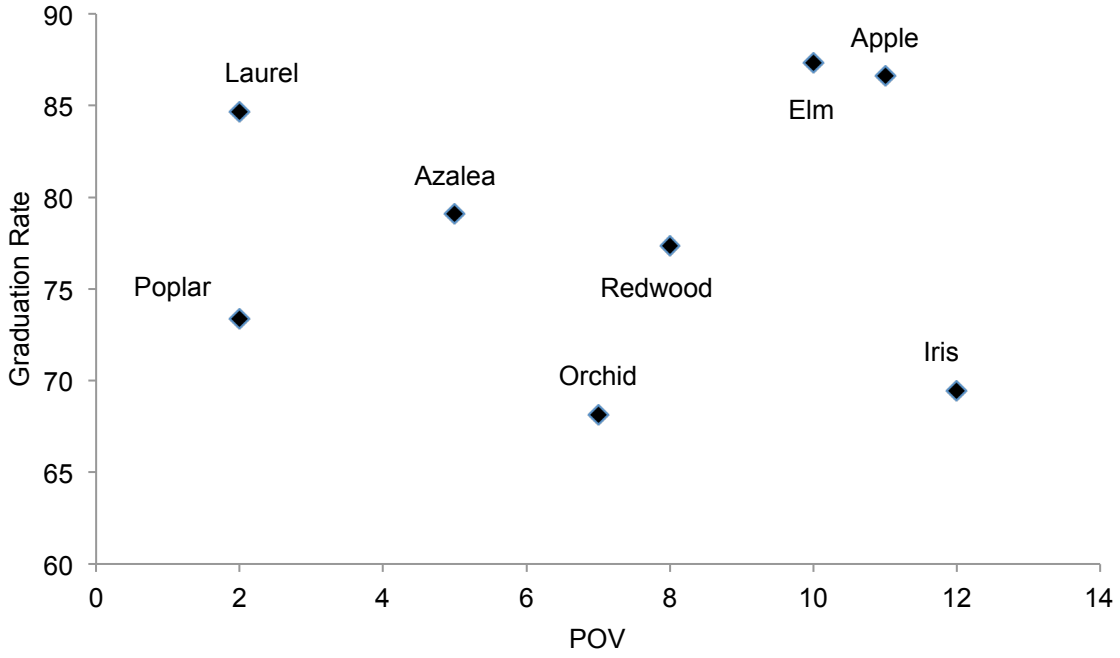

FIGURE 2.33. Four-year graduation rates, Class of 2011, compared to POV.

Chapter 3: Conclusions and Implications

In the preceding chapter, we presented, in detail, our findings from data collection and analysis of a variety of qualitative and quantitative data collected from our eight sample schools over the five-year study period. In this chapter, we summarize the findings that emerged from these analyses and how they help to address our research questions. As in Chapter 2, the discussion is organized around the three research questions. In addition, as we discussed and analyzed various data sources, 12 overarching themes emerged that help to encapsulate the major findings from this study. We present and briefly summarize these themes and then discuss our assessment of their implications for various stakeholders.

Research Question 1: To What Extent Does South Carolina's EEDA Facilitate the Development of POS?

We have discussed the challenges the study team faced in developing measures to be able to examine the presence of Perkins-IV defined POS programs at our sample schools. We described the quantitative proxy measures (POS1 And POS2) and the one qualitative, and more direct, POS measure that allowed us to examine trends in both student- and school-level data across schools to assess the presence and participation in possible POS. It is important to remember as we review major findings that EEDA is a much broader initiative than Perkins IV and that fact will impact patterns that were discovered. It was often hard to discern whether the presence of any POS in schools and trends across programs and student participation was a result of the EEDA policy, other factors, or some combination of factors. Although we began our study in the early stages of EEDA, some schools had already been implementing aspects prior to passage of the policy. In addition, during our study, there were many complex influences on the schools, including a deep economic recession, which had a major impact on the resources available at some of our sample schools. It is likely that POS development in schools was the result of a combination of the policy with a variety of other factors and circumstances at each of the sample schools, making it difficult to discern key factors.

We offer some observations about what we saw in schools relative to CTE programs and their alignment with Perkins IV elements, their possible influence on student outcomes and how these may have been influenced by the EEDA policy. The following is an outline of the key findings, which are then discussed in more detail in the remainder of this section.

Mixed Findings on the Development of POS

We found evidence of potential POS and varying levels of student involvement across sample schools and over the study period. However, the evidence was mixed and inconsistent across measures. The student- and school-level data collected and examined across a variety of data sources and approaches produced a mixed picture of the development of POS and student involvement in these across sample schools during our study period. There was evidence of the development of at least some aspects of Perkins IV-like POS in all sample schools and evidence that at least some portion of students at each of the sample schools were completing coursework in these POS.

There was variation across schools in the percentage of students completing CTE course sequences and slight to moderate decreases in percentages between the 2009 and 2011 cohorts. There were students found to be completing CTE course sequences across all schools, with an average of 15% of students in the 2011 cohort (previously defined as POS1 students) completing these sequences. But percentages varied widely across schools, ranging from less than 1% at one school to 36% at another. Given the emphasis in EEDA on the development of career majors and pathways, we expected at least a slight increase in the percentage of CTE course sequence completers between the 2009 (pre-policy) and 2011 (early-policy) cohorts at most schools. However, there was a definitive increase in completion between the two cohorts at only one of the sample schools (Laurel). The other schools experienced various degrees of decline in CTE course sequence completion between the 2009 and 2011 cohorts.

At five of the eight sample schools there was an overall increase in the number and percentage of state-defined CTE program completers over the study period, with large increases at two schools and moderate increases at the other three. In contrast to findings from the student-level cohort data, a majority of sample schools experienced an increase in the number of students completing state-defined CTE programs between the 2008-2009 and 2010-2011 school years. Only three of the sample schools experienced declines in CTE program completers over that period. The average percentage of state-defined program completers as a percentage of eleventh- and twelfth-grade enrollment across schools was around 12% in 2010-2011 school years, with a range from 3% at one school to 19% at another.

At least half of all students in sample schools took at least one state-defined CTE program course but overall CTE participation dropped at the sample high schools over the study period. By the 2010-2011 school year, at least half of the students enrolled at each sample school had taken at least one CTE program course over the study period. However, overall participation (both number of students taking at least one CTE course and overall enrollment in CTE courses) in state-defined CTE programs declined across seven of the eight sample high schools over the study period. Participation rates varied widely across schools, with some schools showing steady declines, some with fluctuations up and down, and others showing little change over the study period.

One of the reasons for an overall downward trend in CTE course taking at the high schools could be a result of increased opportunities for students to take introductory CTE courses in middle school. For example, all South Carolina students must take keyboarding as a requirement for high school graduation. Keyboarding is a one-half credit class that was once offered exclusively in high school. Many school districts now offer keyboarding in middle school. Being a required course, if more students opt to take keyboarding in middle school, the average number of CTE courses taken by students in high school will subsequently be affected. Other introductory CTE courses may also be migrating to the middle school. This is a school by school situation that varies across the state, but could explain some or even all of the decline in CTE participation across seven of the eight sample schools.

The downward trend in CTE enrollment also contradicts reports of students and staff during site visits, where there was a perception at a number of schools that not only had awareness of CTE increased, but also that CTE course-taking by students had changed and/or increased during the

study period. It may be the case that *some* teachers *were* seeing more students in their classes, even if overall enrollment wasn't increasing, if IGPs were in fact channeling students to more, and perhaps more diverse, CTE courses. In addition, teachers at a number of schools reported more appropriate placement of students in their courses and in state-defined CTE programs in general and that may have influenced their perception of an increase in participation rates.

Only two schools were found to have POS that met the study team's criteria for substantial evidence of the four Perkins IV core elements but progress was being made across schools in putting core elements into place**.** Evidence from the school-level variables on POS that explore trends in state-recognized CTE programs and participation in these by students over the study period also provide mixed results as to the existence and/or participation in POS-like programs over the study period. There was a substantial increase in the number of these CTE programs at only two of the eight sample high schools. In addition, at only two schools (Redwood and Iris) did the study team find CTE programs that met the team's criteria for the four Perkins IV core elements. Two other schools (Azalea and Apple), however, had at least half of their state-defined CTE programs that met criteria for three of the four Perkins IV core elements. In addition, there was evidence at all schools that one or more of the core elements were in place across a number of types of programs and reports by staff that efforts to further develop these elements was ongoing.

Most schools did not show consistent trends across our various POS variables over the study period. Some schools showed increases in some measures while showing declines in others. For example, Orchid had a large percentage increase in the number of state-defined CTE programs and a moderate increase in percentage of completers of those programs over the period, but a large drop in CTE participation over the period. Azalea had an increase in the number of state-defined CTE programs offered but had large decreases in both the number of completers of these programs and the overall number of students participating in state-defined CTE programs. Redwood, one of the two schools found to have study-defined Perkins IV POS, had a slight increase in percentage of state-defined CTE program completers but added no state-defined CTE programs during that period and experienced the largest decrease in overall CTE participation of any school.

These mixed trends in POS program development and student CTE course-taking and completion of state-defined CTE programs may reflect the early stage of policy implementation. At the time of our first site visits to schools in 2009, many schools were still developing majors and combining them with CTE programs and/or dropping program offerings to adjust to the policy during the study period and declines may just reflect this adjustment period. EEDA requires putting into place courses and POS across the curriculum and not just in CTE, and thus, courses offered for state-defined CTE programs may have been reduced temporarily while courses for other career majors/pathways were being put into place. Data showing schools that had an increase in the number of state-defined CTE programs but not a comparable increase in number of completers, such as at Orchid, may indicate that during this period there was a lag in access to programs and courses as new programs were being established, but enough courses were not yet in place to allow students to be able to complete a program before they graduated. It is also possible that the programs were not adequately promoted to students or students faced difficulties in accessing and/or scheduling courses needed to complete state-defined CTE

programs. The loss of faculty and resources due to the economic recession also impacted a number of our schools. For at least one-third of the schools, due to sample selection, progress had already been made on implementation of POS-like reforms prior to the study's start. This would have given both cohorts at some sample schools similar access to CTE programs and the courses allowing them to complete them. Some of the early implementation activities may have been due to policy passage but others due to factors, such as implementation of other reform measures that encouraged pathways development such as High Schools That Work or Smaller Learning Communities.

Findings at several of the schools help to illustrate trends and contributing factors to POS**.** Trends at five of the schools warrant comment here as illustrations of possible trends and contributing factors to POS development, or lack thereof, over the study period.

The school with the largest positive trends across POS variables was Laurel. During that three-year period, this school had the largest increases in the number of state-defined CTE programs and the number of completers of these programs of any sample school. Laurel was established around the time that EEDA legislation was being developed and the school was designed to meet the demands of the new policy and the curriculum was designed to be centered around career majors and clusters through High Schools That Work and Smaller Learning Communities. During interviews, the principal and staff reported having a high level of commitment to the EEDA policy and the development of career pathways. Given the school's focus and the short amount of time it had been operating, the steady increase in programs might be expected, as the high school had become more established and had time to develop more programs. Although the EEDA may have been the originating factor in the interest in development of POS, it is not clear if the policy continues to be the driving factor.

Orchid had the second largest increase in the number of state-defined CTE programs over the study period. The increase in programs over the period seems to be the convergence of several factors at the school. Orchid has had a long-term commitment to offering CTE programs on its campus. We were told by staff that this commitment developed because a large portion of their student body is poor and unlikely to be able to afford to go on to college. The school wanted to make sure that their students are prepared for work after high school graduation. Due to this commitment, the structure for career pathways had already been put into place at the school prior to EEDA through implementation of High Schools That Work. The passage of EEDA only strengthened this orientation. But the stronger impetus for the increase in their efforts on career pathways and curriculum integration, as reported by staff during interviews, came from the receipt of funding for Smaller Learning Communities. Staff reported that the school redesigned the curriculum around clusters and organized their small learning communities around clusters of related pathways. Each Smaller Learning Community contained relevant CTE content teachers for the clusters, such as for business and marketing, and core academic teachers who were co-located for better coordination. Development of state-defined CTE programs was one product of this effort, which was then reportedly strengthened through the policies put in place by EEDA, but the policy is only one contributing factor to the continued commitment to POS-type programs at this school.

At Iris, even in the face of a number of challenges, the school continued to have a low ratio of students to state-defined CTE programs, making these more available to students. These challenges, as described earlier, included the loss of school resources and one-third of its faculty combined with the redirection of efforts to improve basic test scores. The development of state-defined CTE programs at Iris pre-dated the study and possibly EEDA. Similar to the situation at Orchid, staff and faculty were highly committed to the pathways approach and the development of POS-type programs for reasons similar to those at Orchid. They are a high poverty school and many of their students do not go on to college and need to be career-ready upon graduation. They felt that the Pathways approach, along with the reforms of High Schools That Work, were important for the futures of their students.

In addition, Iris was one of the two schools that was found to have CTE programs that met study-defined criteria for the four Perkins IV core elements. Three of these study-defined Perkins IV POS were identified as offered to students at the school. The school is unique among our eight sample schools, with a community college located very close to the high school campus, making it easier for cooperation and sharing of faculty/courses so that the college serves in many ways as a career center for the high school. In fact, courses for the three majors/programs that were identified as study-defined Perkins IV POS are taught by faculty from the community college. The programs are based on local industry needs and South Carolina standards and students can do apprenticeships while taking courses and earn college credit for all three programs. All three programs prepare students for industry certifications as well as to go on in two- or four- year degree programs.

Redwood had six study-defined Perkins IV POS available through the school's partner career center which had close ties with a local community college. These ties included relationships between the faculty of this college and the teachers for these programs, and strong advisory groups that helped to promote the progression from the high school to the college programs. The fact that this school was also one of the early implementers of High Schools That Work (HSTW) and considered HSTW as "part of the fabric of their school" may also have contributed to school support of these POS.

It is doubtful whether either of these two schools with study-defined Perkins IV POS would have had them without their partnerships with career centers and/or community colleges. However, although having a partner career center or ties with a local community college may help boost the efforts to develop a POS, neither are the sole contributing factor to their development. Other schools in the study had ties to local community colleges and yet had not developed study-defined Perkins IV POS. In addition, at the other school with a career center, Azalea, no programs met all of the criteria for a study-defined Perkins IV POS, although it had the largest percentage of programs (57%) that met the criteria for three of the four elements. Staff at Azalea did not have the same close ties to either the career center or the local community college as did staff at Redwood. The difference in results for Redwood and Iris appeared to be the quality and depth of the collaboration they had with their partners. Partnerships are necessary to the development of POS, and the real key seems to be the nature and strength of the partnership.

Finally, regarding the least POS-focused of the sample schools, Poplar, added no new state-defined CTE programs over the period; yet it experienced the second highest increase in number

of completers of these programs and was the only school that experienced an increase in overall CTE program participation during the study period. Even with these increases, the school still had a relatively low percentage of state-defined CTE programs and completers of these programs. But these small increases are important to note here, because of the overall culture we found at Poplar. The school seemed more focused on four-year college preparation as opposed to expansion of CTE program options for students. It was noted during site visits in 2009 that there seemed to be stigma attached to taking CTE at this school. College-bound students were encouraged to take as many Advanced Placement (AP) courses as possible, rather than CTE courses, because few, if any, of the CTE courses carried AP credit.

Foundational Elements for POS Development

EEDA is helping to facilitate the development of some of the foundational elements considered necessary for POS development in sample schools. Although we did not find many POS at sample schools that met study-defined criteria for the Perkins IV core elements, our qualitative data revealed that components of EEDA are helping to build some of the foundational elements and framework considered necessary for the development and successful implementation of these types of POS. Various foundational elements were being put into place across our sample schools leading to the potential for the development of more POS in schools over time.

EEDA led to the development of several key initiatives that promoted alignment of secondary and postsecondary statewide: the South Carolina Course Articulation and Transfer System and the South Carolina Course Alignment Project. Our study results showed that such integration and alignment was more common at study schools with strong CTE programs. Strong relationships between high school career centers and local community colleges were also instrumental in creating strong course alignment. This was particularly the case when the local community college partners valued the links between the high school and college programs and coursework and were active partners in developing the high school curriculum and programs and in recruiting students. Schools with established advisory groups and partnerships with local businesses strengthened secondary and postsecondary alignment.

Although integration of academic and CTE content was occurring in some instances in some sample schools, other developments discussed above often influence the academic-CTE integration process. To increase integration, academic teachers and school counselors guiding students in the development of their course schedules and Individual Graduation Plans (IGPs) need to become more knowledgeable about CTE courses and programs. The IGP process has become a viable way in many of the sample schools to facilitate these discussions, reduce the stigma of taking CTE courses, and increase school staff's knowledge of CTE.

The successful integration of academic and CTE course content often relied on individual teachers to "champion" and implement such integration. That is, such integration tended to reflect individual preferences rather than institutional culture at most of our sample schools. These efforts were also more likely to occur in CTE than in non-CTE courses. Policies to encourage cross-curriculum integration succeeded with simple practices, such as providing common planning periods for CTE and academic teachers, having CTE and academic teachers physically located in close proximity to one another (i.e., in the section of the building) and

encouraging cross-discipline projects. Such arrangements allowed for more formal cross-curricular planning to occur and promoted synchronicities that would not have happened otherwise. At some schools, the cross-teaching of core courses and the sharing of faculty contributed to stronger alignment. Smaller Learning Communities also facilitated academic and CTE integration, especially in those schools where the communities were organized around particular career clusters.

A key barrier to developing rigorous POS in sample schools was the requirement that students must pass college-prep level core academic courses in order to meet South Carolina academic standards. Several staff and teachers at our sample schools described the inordinate amount of time and resources spent ensuring that low performing students pass these courses in order to graduate, regardless of whether or not they were CTE students. CTE teachers also reported that many students were inadequately prepared for the knowledge and skill levels required to be successful in their CTE courses. Students were particularly lacking math and reading comprehension skills. This lack of appropriate skills was noted across schools and across program areas and was not just an issue for low performing students but also for "average" students. One contributing factor was that some schools were still using CTE classes as "dumping grounds" for low performing and/or "problem" students. In addition, a number of CTE teachers attributed the presence of so many unprepared students in their courses to a lack of understanding of their school administration about the level of skills necessary to successfully complete these courses.

Although EEDA does not require a direct link between a career major and a postsecondary credential, there were still a number of career majors at every school that were reported to have a postsecondary component culminating in a credential, certificate, or degree at the postsecondary level. Overall, a little over half of the CTE school majors reviewed in sample schools were found to lead to and/or prepare students for postsecondary training, education and/or degrees in that area. In addition, all of the sample high schools or their partner career centers offered opportunities for students to earn industry-recognized credentials while in high school in at least one of their state-defined CTE programs, which gave students the possibility for a direct link to employment after graduation.

Even though there were strides being made at the state level, our study offers mixed findings regarding the influence of EEDA on opportunities for dual credit at our sample schools. There was wide variation across sample schools in the availability and taking of dual credit courses by all students, regardless of whether they completed CTE course sequences or not. All eight of our sample schools reported having at least a few dual enrollment agreements and credit transfer options with local postsecondary institutions in place during the time of our first site visits in 2008-2009 and all planned to continue to develop these options across a number of subject areas in the future. Even though dual credit options were available, students at all schools were not taking advantage of these options. At four of our sample schools, students completing CTE course sequences in either the 2009 or 2011 cohort did not take any dual credit courses. There were increases in the numbers of CTE course sequence completers taking dual credit courses between the 2009 and 2011 cohorts at only two schools. The two schools with the highest percentages of CTE course sequence completers taking dual credit courses in the 2011 cohort were the schools that were found to have study-defined Perkins IV POS. The percentage of non-

CTE course sequence completers taking dual credit courses also varied widely across schools and the percentages taking these courses remained relatively stable between the 2009 and 2011 cohort except at one of the schools. At the sample schools that were four-year college oriented, there was more emphasis on offering Advanced Placement courses than dual credit courses.

The development and maintenance of students' four-year IGPs emerged as an essential component of EEDA policy implementation and the promotion of POS in general. Through the IGP process, various sources indicated that students gained important skills in planning for careers and post-high school life. The process provided students an opportunity to think about their career goals and the types of courses and programs needed to achieve those goals. Guidance personnel, teachers as well as students all pointed to IGP development as a valuable tool for career counseling and planning. The IGP process helped to make it more likely that courses were related to students' interests and courses of study and encouraged students to begin planning for their post-high school careers, whether that involved postsecondary education or not. Counselors reported seeing a steady growth in students' knowledge of career pathways and majors over the period as a result of these efforts. Most students interviewed liked the fact that there was a process in place to help them think about and develop future career goals and that they could then select courses based on these goals. Many of these students reported that being able to select courses based on their interests made them more motivated to come to school and do well in their courses.

From comparisons to findings in the other NRCCTE POS studies, it appears that when emphasis on these types of plans increases, as under EEDA, students are likely to receive more academic and career guidance services. In addition, students in our sample schools most frequently identified school guidance counselors as the most helpful in the development of their IGPs, as compared to students in the other NRCCTE POS studies, who indicated that they found their parents most helpful in plan development. The higher percentages of students naming counselors in our sample schools suggest that state policy specifically targeting the role of counselors can enhance their influence on career choices and possibly provide a more systematic process for career planning.

Structured guidance for career planning and academic advisement is a critical underlying element for participation in POS. The strong emphasis on combining both career-focused guidance and academic advisement in EEDA and the requirements of the IGP process assisted guidance personnel to focus on students' need to engage in career development activities such as exploration, interest assessments, and opportunities to talk about career issues and career options with knowledgeable adults. Enhanced guidance was seen by staff and students as an essential service and increased the amount of time counselors in our sample schools spent with students engaging in one-on-one career-based counseling. There was an increased effort to meet with every student on an annual basis. It has increased the depth and breadth of information that students receive about their educational and career opportunities in career and technical fields and was an essential channel for dissemination of information to students on available POS. Further, there has been a greater effort to promote CTE programs to students and engage parents in the course and career planning of their children.

Policy implementation facilitated more appropriate placement of students into CTE courses in some sample schools. Some CTE teachers felt that more students were being directed into their courses than previously and that there was more appropriate placement of students in CTE courses; the students "want to be there" and "want to do the work." This has the potential to strengthen POS and student commitment to complete POS. Teachers felt that this was a result of improved knowledge of CTE courses and programs of students, parents, and counselors, due in large part to the IGP process. In addition, it is clear at several schools that any stigma associated with taking CTE courses or attending a career center has been reduced in recent years, although stigma remains present at some study schools. Although there was an overall decline in CTE participation in our sample schools, it appears that aspects of the policy have helped to facilitate a better awareness of CTE courses and their importance to career pathways, perhaps attracted a wider range of students to these courses, and facilitated more appropriate placement of students in CTE courses.

One of the factors dissuading students from taking CTE courses was the "course tradeoff" experienced by students deciding between these courses and Advanced Placement, required core academic, honors, and dual credit courses**.** Students have to balance conflicting demands and face tradeoffs when considering whether to take CTE, core academic, Advanced Placement (AP), and dual credit courses. There is often limited space for students in CTE courses and limited time offerings for these courses, making it difficult to schedule CTE courses around the required core academic courses and sometimes impossible to get into certain CTE courses. In addition, as mentioned earlier, some students may not take CTE courses because these courses rarely carry honors, AP credit, or dual credit, which are more heavily weighted than most CTE courses in calculations of GPAs. College-bound students interested in CTE courses have to balance CTE with other courses to maintain their GPAs. These challenges appeared to have hampered efforts to integrate CTE and academic programs into seamless POS pathways.

CTE teachers and school counselors expressed concern about the emphasis on postsecondary education or training as a requirement for a CTE program to be considered a Perkins IV POS. An emphasis on postsecondary education and training without also including industry-recognized credentials or certificates that may not require postsecondary education may actually lead to an underestimate of student and POS success. This emphasis also does not take into account local economic patterns and labor force needs, and several of the realities in high poverty communities. CTE pathways that need little to no training after high school but lead more directly to employment, such as manufacturing, transportation and logistics (automotive), culinary arts, cosmetology and horticulture, may be argued to be more important programs for high poverty schools to develop and more likely to lead to "success" for their students. Staff argued that alternative measures of success, including internship experiences, co-ops, and obtaining secure employment after graduation, should also be considered.

Although state policy may be helping to lay some of the foundational elements for the development of POS, our study offers mixed evidence as to whether the level of EEDA implementation influenced the development of POS at our study schools. By design, schools were at various levels of implementation at the start of our study and we wanted to track change over time to explore whether the policy may be influencing the development of POS. Some of the data suggested that higher policy implementation levels were associated with the existence

and/or increase in either POS programs or participation of students in POS, but findings were inconsistent across schools and POS measures.

There was some relationship between policy implementation level and the number of study-defined Perkins IV POS identified at schools and percentages of state-defined CTE programs that met the study-defined criteria for at least three of the four Perkins IV core elements. But the relationship was inconsistent. The school found to have the highest number of study-defined Perkins IV POS, Redwood, was a high implementation school, whereas the other school found to have study-defined Perkins IV POS was a medium implementation school. The two schools with approximately half of their eligible state-defined CTE programs that met criteria for at least three of the four Perkins IV core elements were medium implementation schools. In contrast, the other high implementation school had the lowest percentage of eligible programs that met three of the four criteria whereas one of the lowest implementation schools had the third highest percentage of eligible programs meeting three criteria.

In terms of student involvement in POS, again, there was mixed evidence. There was a small overall positive association between the percentage of students who had completed a CTE course sequence and the level of implementation, but the relationship across schools was inconsistent. There were large percentages of these CTE course sequence completers at low, medium as well as high implementation level schools. There was a stronger positive and more consistent association between the numbers of state-defined CTE program completers and a school's level of implementation. As the level of policy implementation at a school increased so did the average percentage of state-defined CTE program completers, particularly for the 2010-2011 school year. However, there did not seem to be a pattern in the relationship between level of policy implementation and changes in the percentage of these types of completers between the Class of 2009 and the Class of 2011. The two high implementation schools had virtually no increase in completers of state-recognized CTE programs between the two cohorts. The largest increases occurred at half of the medium implementation schools whereas the largest decreases occurred at the other half of the medium implementation schools.

There were no discernible patterns across policy implementation levels for several other POS-related outcomes, such as the changes in the overall percentage of students who took courses in state-defined CTE programs, with all but one school experiencing a decline in enrollment in these courses over the study period. The only school with an increase was a low implementation school. Schools with the largest decline in overall CTE enrollment were medium implementation schools.

These mixed findings could be the result of a number of factors. First, it is important to emphasize that the policy was relatively new during these years and majors/programs and career pathways across the curriculum were still being developed for CTE as well as other types of majors/programs. POS2 programs are limited to only those majors/programs that are SDE recognized CTE programs. Changes may have been occurring at sample schools in non-CTE programs, such as journalism or performing arts, and these changes would not be identified in this analysis. Also, state budget cuts and various local contextual factors (e.g., businesses closing and other impacts of the recession on the school's community, declining enrollment, etc.) could have influenced the study results.

Research Question 2: What Impact Does the Level of Local Economic Resources Have on the Implementation of EEDA and the Development and Implementation of POS?

In terms of both staff time and fiscal resources, a state policy as comprehensive as EEDA is expensive to implement. The levels of implementation among the eight sites have been affected by a variety of variables, such as resources available within the school districts and communities, declining state funding for EEDA and other educational services, and increased demands placed on school personnel. Schools that had access to staff with prior knowledge of and experience with various policy areas, and schools in communities that included diverse local businesses that were willing to provide a variety of resources, clearly benefitted from such additional resources. On the other hand, challenging economic conditions may be related to a high perceived need for POS, and thus serve as a motivator for prioritizing POS development. We present findings related research question 2 in this section.

State and Other Funding Sources

Support beyond the local level is crucial for policy implementation. Research question 2 relates to local economic resources at the sample schools, but a brief discussion of district, state, and federal resources to support such a policy is important as well. Support of the policy can come in the form of direct funding to a school (resources within the school and school system), or in the form of support resources developed and paid for beyond the local school and school system level. We will touch on some of the indirect support issues (educational products developed at the state level, district emphasis on the policy, the RECs, program template development, access to career centers and technical colleges, etc.) later in this section. For now we turn to direct economic resources available to the schools from state funding sources.

Because state funding has been available for only some portions of the policy, in many ways the EEDA policy could easily be considered an underfunded mandate. The policy requires major resources to reorganize curriculum and hire enough staff to meet the state mandates. For example, the EEDA law mandates lower student-to-guidance personnel ratios, and districts have been hard pressed to hire and retain the needed school counselors and/or career specialists (or any other personnel) in the midst of freezes and cuts to a range of other positions. This has become particularly difficult with the recent, and continuing, economic situation, resulting in repeated state budget cuts to education. Any state desiring to successfully implement such a state mandate would be well advised to use caution when mandating the implementation of an ambitious, high-cost reform in the absence of sufficient financial support for schools.

In the years that EEDA was first being implemented, the U.S. and other nations across the globe experienced a lengthy recessionary period. The first class required to have the eighth-grade IGPs was just entering high school (ninth grade) in 2008, the year most economists point to as the beginning of the recession. The Regional Education Centers were in place, but just being developed. Templates for POS were being developed; however, in the plans to develop the pathways and POS, support from local businesses and institutions of higher learning was to be crucial. In 2012 there are indications that South Carolina is recovering from the recession that began in December 2007, but the recovery is slow.

Oliff and Leachman (2011) found that of 46 states that publish education budget data in a way that allows historic comparisons:

- 30 states were providing less education funding than they had four years previous to 2011;
- 17 states had cut per-student funding by more than 10% from pre-recession (pre 2008, inflation adjusted) levels; and
- 4 states— South Carolina, Arizona, California, and Hawaii — each had reduced per student funding to K-12 schools by more than 20%.

In fact, South Carolina cut its per pupil education budget 24%, more than any other state, during the recessionary period between 2008 and 2011. The state also cut funding for higher education between 2008 and 2011 by more than 30%, more than any other state in the nation (Sumeta & Kinne, 2011). For FY12, there was a 4.6% (inflation-adjusted) increase budgeted but it may prove too late for some of the EEDA elements, as local district budgets may include other priorities.

Federal employment data show that school districts began reducing the overall number of teachers and other employees in September 2008, when the first round of budget cuts began taking effect. By September 2011, local school districts had cut 278,000 jobs nationally compared with 2008. At a time when the nation was pushing to produce workers with the skills to master new technologies and adapt to the complexities of a global economy, large cuts in funding for basic education could have undermined crucial school reform efforts aimed at better preparing children for the future. And local school districts typically have little ability to replace lost state aid on their own due to the dwindling tax bases that usually occur during recessionary periods (Oliff & Leachman, 2011).

The issue was not simply cuts in state funding. Levels of EEDA implementation at the eight high school sites were reported to have been affected by a variety of factors including the presence or absence of jobs and job shadowing opportunities in the specific communities, resources available within the school districts, and increased demands placed on remaining school personnel. A few schools lacked some of the basic resources necessary to design and implement POS. Such resources include the knowledge and background to train teachers and staff, the in-school human and fiscal resources to implement reforms, or local businesses to provide mentoring, internships, and work-based learning opportunities.

Not surprisingly, however, implementation was observed and reported to have been facilitated by access to certain resources, such as staff with prior knowledge of and experience with various policy areas or location in a community with diverse local businesses willing to provide resources and educational opportunities for students, even in challenging economic times. And some of our sample schools were demonstrating great ingenuity in finding such opportunities for their students. During site visit interviews, the state was credited with providing good virtual job shadowing and other general resources.

In terms of both time and fiscal resources, a state policy as comprehensive as EEDA is expensive to implement. Staff in all of the schools visited, whether they were located in high- or low-poverty communities, mentioned struggling to carry out the policy without being able to hire more staff. Even the school with the most staff and district resources to implement the policy was struggling.

Access to Facilities Dedicated to CTE and Commitment to Career-Focused Reform

Access to a career center or technical college appears to be related to more highly developed POS. Azalea High did not have any programs that completely qualified as having all the elements of a Perkins IV POS as defined in our study, but over half of their CTE programs met 3 of the 4 study-defined requirements. Azalea is one of the two schools in the study with career centers located off campus yet close enough so that students could get there easily.

The school with the most programs fully qualifying as Perkins IV POS by our definitions was Redwood, the other school with an off-campus career center fairly close by. Redwood was one of only two schools where we found study-defined Perkins IV POS (six of the nine total such POS found across the sample schools) existing at the time of our site visits in 2008-2009. The other school with study-defined Perkins IV POS (three of the nine such POS) existing in 2008-2009 was Iris. Iris did not have access to a career center, but did benefit from something similar. The local technical college is very near (geographically) to Iris and worked closely with the high school to give students access to POS.

We noted early, in our initial site visits, that career centers were important resources and seen as vital to successful policy implementation for schools that used them. One principal told us that her school would not be able to implement EEDA without their district's career center. With the courses and programs available at the center, the school was able to offer about a dozen career clusters as compared to five or less without the career center. A community or technical college could serve that purpose as well.

A focus on career training is also important to the development of POS. Often the more comprehensive schools were either not able, or not motivated for one reason or another, to fully focus on career pathways and POS. We observed that some schools had a culture of broad and general college preparation rather than career focus, and they were not likely to change that culture without substantial financial support or other motivation. The priorities for the schools in less economically disadvantaged areas were different that those of their more disadvantaged counterparts.

Commitment to the EEDA policy can produce results. Although a culture of broad and general college preparation usually resulted in lower poverty (more affluent) schools not having much POS-related success, the one exception was Laurel, a low poverty, newer school, that was built and opened at about the same time as EEDA became law. Laurel organized around smaller learning communities and appeared to be focusing on at-risk students especially well. Although many of their students could certainly broadly be defined as college prep students, and none of Laurel's programs were found to completely qualify as highly developed study-defined POS, Laurel was one of two schools that had a substantial increase in CTE program completers

between 2009 and 2011. Laurel was also the school with the highest ratio of CTE program offerings to student enrollment. During the initial site visit to Laurel, staff members were asked about their awareness of EEDA policy. Laurel staff indicated that their school was "built around EEDA."

The other school that was somewhat of an anomaly to the others in our sample, possibly due to high commitment to the policy, was Apple. Apple was a comprehensive school with neither a career center nor a technical college close by, and one of the highest poverty schools. Yet Apple was the other school with substantial increases in CTE program completers between 2009 and 2011. And Apple was the highest of the high poverty schools in terms of the ratio of CTE program offerings to student enrollment. During site interviews, Apple staff members were optimistic about the state policy. Both Laurel and Apple staff indicated a commitment to the policy and a desire to be able to offer to their students the opportunities the policy was created to produce.

Local Economic Conditions as Motivation toward POS Development

Schools' selection of majors/programs to offer was often based on local economic conditions and resources**.** Under EEDA, schools are to develop and offer locally relevant majors/programs. Which majors and programs to offer students is being left up to individual schools, with assistance from school districts and the state. We found that schools and districts decided which career majors, programs and POS to implement based on a number of factors: (1) what was already in place; (2) local labor market needs; (3) input from business partners; (4) skill/expertise needs of particular local company; (5) availability of expertise and classes at local technical and community colleges; (6) availability/affordability of "ready-made" programs like Project Lead The Way and ROTC; and (7) surveys of student interests. Obviously, all of these (except item #6) can be tied to local economic conditions. The environment in which the students live as well as the resources available to the school can impact the demand for certain programs as well as the ability of the school to offer certain programs. State and federal resources can play a large role in this by developing templates and ready-made programs that can be implemented in schools regardless of the local resources. Online resources can play a role. Businesses can be encouraged in various ways to see the benefits of working with local schools. The EEDA legislation laid out a major role for businesses in educating the future workforce, but the roles businesses actually play in schools varied widely across our sample schools. Factors for business participation included the needs of the local labor force, location of businesses relative to the school, the type of businesses available for job shadowing and internships, how aggressive schools and/or districts try to recruit businesses, and interest level of business in partnering with schools.

More challenging community economics may be related to more highly developed POS under EEDA, perhaps due to increased motivation to develop clearer avenues toward careers and employment. At the local sample school level, some sites were located in communities with diverse local businesses that were willing to partner with the schools and provide a variety of resources, such as guest speakers, internships, and other work-based learning experiences for students. In other contexts, communities lacked local businesses to provide such opportunities.

The presence of local resources to facilitate career-focused education was clearly beneficial to our sample schools; therefore, it may seem obvious that more community resources would translate to more highly developed POS and pathways. However, the contrary seemed to be true in several cases. For example, one of the highest poverty sample schools, Apple High, was in such a remote rural location that there was no cellular phone service available in the immediate school area and a long drive was necessary to reach communities offering diverse types of employment. The best jobs and opportunities for job shadowing or internships were over 20 miles from this school. Although there was access to a career center, it was difficult for students to arrange schedules to try to make classes at such a distant location. However, the remoteness of this school appears to have been a motivator toward the development of POS. Staff at Apple High indicated enthusiasm for the career development elements of EEDA. Although Apple High, also one of our smallest schools, had not developed as many CTE majors/programs as the other sample schools, half of their CTE programs met 3 out of the 4 requirements for our strictest interpretation of a Perkins IV POS (a POS4), indicating a deep commitment to what EEDA might be able to do for their students and a commitment to beginning to develop highly evolved POS.

We also found a slightly positive relationship between poverty and the portion of our measurement of policy implementation relating to integration of rigorous academic and career-focused curricula organized into career clusters and majors. In general, the higher the school poverty level, the more we found evidence of implementation of this portion of the policy.

Students from schools in higher poverty communities reported more intentions to complete majors/programs, had more program completion, and switched career clusters less in high school. For whatever reason, the trend for higher poverty schools was that their students were more likely to choose a major or program and stick to that major/program through completion. These findings are based on the analysis of cohorts of students who had been at each school for three consecutive years. Looking at students that way aided interpretations at the school-level, as those students had more direct exposure to the programs and activities at the particular schools they attended, i.e., transfers in and short-termers were not included. Note that these data are quite different than those usually reported in school report cards and other publications because these are the students who have not dropped out and are not highly mobile. In some ways, these students are not the most at-risk students. However, the fact that the high poverty schools tended to have more students who chose a program and stuck to it can be an indicator of the real value of POS for students from high poverty communities. The percentage of the Class of 2011 cohort defined this way and completing a sequence of CTE courses within one career cluster was strongly related to community poverty, with students in the higher poverty schools completing more CTE sequences than students in low poverty schools.

High school seniors' plans to continue formal education after high school and have a job at age 30 did not differ significantly by local economic condition for the Class of 2011 but specific postsecondary degree plans did differ. Differences were noted between the Class of 2009 and the Class of 2011 both overall and by poverty. Across all three community economic levels (low, medium and high poverty), a majority of high school seniors from our sample schools in the Class of 2011 planned to continue formal education immediately after high school. The only economic group, however, to actually show an increase between the Class of 2009 (limited

exposure to EEDA) and the Class of 2011 (exposed since eighth grade) in plans to immediately after high school "enroll in a 4-year college or university, enroll in a 2-year community college, or enroll in a 2-year community college and then transfer to a 4-year college/university" were the students from the high poverty schools.

A majority of students across all three community economic levels also planned to have a job at age 30 and could provide a legitimate job name. There were no significant differences across poverty levels on that question, but the percentages of students responding positively to that question increased between the Class of 2009 and the Class of 2011. And the percentages of students reporting that they did not plan to have a job at age 30 went down between the Class of 2009 and Class of 2011, particularly for the students in high poverty schools.

Significantly more Class of 2011 seniors from low poverty (more affluent) schools planned to complete a bachelor's degree or higher, compared to Class of 2011 seniors from moderate or high poverty schools. However, between the Class of 2009 and the Class of 2011, an increased percentage of students from both high and low poverty schools planned to complete a bachelor's or master's degree.

Research Question 3: What Impact Does the Implementation Of EEDA- and Perkins-Required POS Have on Student High School Outcomes and Postgraduation Preparations and Plans?

The expectations for EEDA and for career pathways reform models in general were that an early focus on career planning and goal-setting, coupled with focusing on a clear career pathway that mixed high quality academic and career-related courses relevant to that pathway, would not only help students be more engaged in high school and improve outcomes at that level but also would better prepare students for their future careers and improve their postgraduation outcomes. Data collected from our eight sample schools offer some insights into whether this type of policy may be helping to achieve these types of outcomes.

EEDA, LOI, and Career-Focused Activities

Students' participation in career planning activities increased under EEDA. No matter which groups of students were analyzed, we found that across all eight sample schools, between the Class of 2009 (little to no exposure to EEDA) and the Class of 2011 (exposed since eighth grade), there were large increases in the percentages of students who either had evidence of having an Individual Graduation Plan (IGP) or reported that they had had "put together a "career plan" or 4-year "Individual Graduation Plan (IGP)…" In fact, the analyses of students who were at each school for at least three years showed that 100% of those students had IGPs. Focus groups of Class of 2011 students in Spring 2011 found that nearly all students interviewed said that they had IGP plans and that the IGP process was generally viewed positively, although it was not clear that students made the connection between the IGP and the selection of major or POS, selection of courses, and planning work-based learning experiences.

Interviews with guidance counselors pointed to the fact that between 2009 and 2012, sample schools had increased opportunities for students in the areas of career development and

exploration, such as increased engagement in career assessments, more opportunities for engagement with community-based industry through speakers, career fairs, work-based learning opportunities, etc., even though some schools lack community resources for these activities. Two activities presented significant differences in responses from the classes of 2009 and 2011 on the *Student Engagement/POS Experiences Survey*. Students were asked if they had ever (1) answered questions related to jobs and careers on a computer or on a questionnaire or (2) been in a class where someone from a local business talked about working at their company or in their career. The percentages of "Yes" responses from the seniors in the Class of 2011 were higher for both of those questions compared to seniors in the Class of 2009. There were no significant differences between the responses of seniors in the classes of 2009 and 2011 in the following activities: researching jobs or careers; researching colleges, universities, or military; speaking with or visiting someone in a career of interest; or touring a local business with a group from school. When analyzed by our measurements of policy implementation (LOI), only being "in a class where someone from a local business talked about working at their company or in their career" elicited significantly different responses from seniors in the two classes. Seniors in the Class of 2011 respond "Yes" to having been in a such a class more often than seniors in the Class of 2009, and the seniors in the higher LOI schools responded "Yes" to that question more often as well.

Comparing seniors in the two classes, there were decreased reports of co-op experiences, increased reports of job shadowing and visiting businesses, and fewer students who had no work-based learning experiences. The *Student Engagement/POS Experiences Survey* asked seniors in the classes of 2009 and 2011 about work-based learning experiences. Seniors in the Class of 2009 responded "Yes" to having participated in co-op (defined on the survey as work experience at a local business in your high school major or career cluster) more than seniors in the Class of 2011. Seniors in the Class of 2011 responded "Yes" to having participated in job shadowing or work-site visits (defined on the survey as visits to work places to observe one worker or many workers) more than seniors in the Class of 2009. Of the six work-based learning experiences listed on the survey, seniors from the Class of 2011 reported less often that they had participated in "none of these" than seniors from the Class of 2009. Counselors reported in 2012 increased opportunities for career development and exploration, such as career assessments, and engagement with community-based industry through speakers, career fairs, and work-based learning opportunities. The surveys of guidance duties in 2009 and 2012 show about the same perceptions of the effect of EEDA on increased duties in "identifying and coordinating work-based/extended learning opportunities for students." These activities ranked fourth among the increased mandated duties reported in 2011-2012, just behind "meeting with parents about career issues." Obviously, identifying and coordinating work-based learning opportunities for students is still being emphasized and still elicits a notable perception of increase in duties in this area since the passage of EEDA.

In 2011, students were meeting more with guidance, and guidance counselors were found to be most helpful in career planning. During student focus groups, counselors were seen as helpful and caring. Some students were, as to be expected, more enthusiastic and talkative than others about their counselors. But in general, their sentiments echoed the responses from the senior Class of 2011 on the *Student Engagement/POS Experiences Survey.* Of the seniors from the Classes of 2011 and 2009 who said that they had put together four-year career plans, those from

the Class of 2011 were 22 percentage points higher in reporting that guidance counselors were the most helpful among five groups (parents/step-parents/guardians, a teacher, a guidance counselor, friends, or no one) in developing career plans in high school. Of the seniors in the Class of 2009 who reported putting together a four-year plan, over 12% reported that no one helped them put together their plan. Just over 4% of the seniors in the Class of 2011 reported that no one helped them. These changes between the Classes of 2009 and 2011 regarding finding guidance helpful and reduced reports of no one helping with career plans held true for both students who reported taking three or more Career and Technical Education (CTE) courses by the time they were seniors and for those taking fewer CTE courses.

Students were asked on the *Student Engagement/POS Experiences Survey*, how much thinking and planning they had done for job-related activities. There were no significant differences in the responses of seniors in the Classes of 2011 and 2009 regarding their thinking and planning on the following activities: gathering information about jobs of interest; taking classes to help decide what kind of job they want; participating in school or out-of-school activities that will help in the decision about the kind of job wanted; or in volunteering, interning, or working on a job to help find out what kind of job they want to have in the future.

EEDA Level of Implementation (LOI) did not seem to be related to differences among the ways groups of students answered these "thinking and planning" questions, with one exception. A larger percentage of seniors in the Class of 2011 from Medium LOI schools reported having made plans to participate or had already participated in volunteering, interning, or working on a job to help them find out the kind of job they want to have in the future (62.0%) than from High or Low EEDA LOI schools (51.8% and 52.2%, respectively; $p = 0.023$). Overall only 56.4% of all seniors in the Class of 2009 at our sample schools had made plans to or had already done these activities.

As a note, when asked, the great majority of students in the Spring 2011 focus groups reported that they believed that they had received and benefitted from substantially more career-focused guidance, information, and coursework than students in previous years. They felt fortunate to have such guidance and opportunities.

EEDA, POS, and Student Engagement

Attendance and tardiness were about the same for members of the Class of 2011 as for the Class of 2009. The *Student Engagement/POS Experiences Survey* queried students on tardiness and absences. The distribution of responses for seniors in the two classes did not significantly differ for the number of times they were late for school, the number of times they cut or skipped classes, or the number of times they were absent from school.

Policy implementation levels at schools did not seem to have any effect on attendance or tardiness. There was only one instance where the distribution of responses from seniors in the Class of 2011 varied significantly by level of policy implementation and it is contrary to expectations. Regarding the number of times students self-reported being late for school, fewer seniors from high policy implementation schools indicated they had never been late for school

(17.3%) than seniors in the Class of 2011 from of low policy implementation schools (23.9% and 24.1%, respectively; $p = 0.026$).

Attendance data on the cohorts of students who were at the sample schools three consecutive years were also analyzed for 2009 and 2011 cohorts. Similar to students' self-reports of absences on the student survey, there appears to have been little substantial change in average attendance rates between the two cohort years. The average attendance rate for the 2009 cohort was 96.5 and that of 2011 was 96.4. Average attendance rates for the cohorts did decrease a couple of percentage points between 2009 and 2011 for Azalea and Apple. Evidence suggests little association between being in a POS and attendance. Much change would not be expected, however, given the already high attendance rates for these students who had been at the schools consistently for three or more years. If there were any trend it was more toward a decrease in attendance rates between the 2009 and 2011 cohorts.

Recorded disciplinary incident rates were slightly higher for the 2011 cohort than for the 2009 cohort. Comparing the 2009 to the 2011 cohorts of students who were at the sample schools 3 consecutive years, the average discipline rates (a constructed student-level variable, determined to be the number of incidents per 100 days of enrollment) increased for some schools. Discipline incidents for CTE course sequence takers at three schools remained essentially unchanged between the 2009 and 2011 cohorts; however, for the other five sample schools CTE course sequence takers experienced an increase in discipline incident rates. And, these rate increases were generally larger than for those who were not identified as course sequence takers. Redwood, the highest policy implementation school, was the only school where average discipline rates decreased for both CTE course sequence takers and non-CTE course sequence takers between the 2009 and 2011 cohorts.

Seniors in the Class of 2011 report that having a major or cluster made it less likely that they would want to drop out of high school**.** Over the entire state of South Carolina, graduation rates have generally improved over the last decade. Many factors may be involved. Looking at school report cards for the eight sample schools, six of the eight schools either maintained or increased their graduation rates between 2009 and 2011. The two schools, Redwood and Orchid, whose graduation rates decreased over the time period, were the two highest initial level of policy implementation schools. However, again, caution should be taken as these are snapshots of performance measures.

On the *Student Engagement/POS Experiences Survey*, students were asked to indicate their level of agreement with the statement that having a high school major or career cluster has "made me less likely to want to drop out of school." The distribution of responses from seniors in the Class of 2009 and seniors in the Class of 2011 differed significantly on this question. More seniors in the Class of 2011 agreed or strongly agreed that having a high school major and career cluster made it less likely they would want to drop out of school, as compared to seniors in the Class of 2009. The percentages agreeing with this statement increased for both CTE (having taken three or more CTE courses) and non-CTE (having taken less than 3 CTE courses) survey respondents between 2009 and 2011.

As for any relationship with policy implementation, approximately 71% of seniors in the Class of 2011 from high policy implementation schools agreed that having a major or cluster made them less likely to want to drop out of school, compared to 67% from medium policy implementation schools and 64% from low policy implementation schools. Note that a majority of seniors in the Class of 2011 across all three policy implementation levels agreed that having a high school major and career cluster helped them to get better grades (75.1%, 71.5%, and 65.3%, respectively).

At schools with more CTE programs and more program completers, higher percentages of Class of 2011 seniors reported that having clusters and majors made them more likely to want to come to school and less likely to want to drop out. Larger percentages of students at higher CTE program implementation schools reported that having a career cluster and major helped them to get better grades than students at low CTE program implementation schools. Interestingly, in contrast to the data that looked at only groups of students who had been at sample schools for three consecutive years, self-reports of attendance by the Class of 2011 on the student survey were associated with the CTE program implementation level at their school. Larger percentages of Class of 2011 seniors in higher CTE program implementation schools reported better attendance (not being late, skipping classes or being absent) than seniors in the Class of 2011 in low CTE program implementation schools.

Higher policy implementation schools had fewer students going to class without homework. The majority of seniors in both 2009 and 2011 reported going to class one or more times without necessary supplies, but more from the Class of 2011 reported never going unprepared compared to those from the Class of 2009**.** A few outcome measurements with significant findings were related to being prepared for class. The distribution of responses for seniors in the Classes of 2009 and 2011 did not significantly differ for the number of times they went to class without finishing their homework. However, across policy implementation levels, the distribution of responses from seniors in the Class of 2011 regarding the number of times they went to class without homework significantly differed, with fewer seniors from high policy implementation schools indicating they went to class without homework finished than seniors in the Class of 2011 from lower policy implementation schools.

The distribution of responses for seniors in the Class of 2009 and in the Class of 2011 did significantly differ for the number of times students went to class without a pencil, paper, book, or other necessary supplies, with more seniors in the Class of 2011 indicating they had never done this compared to seniors in the Class of 2009. A majority of seniors in both years, across policy implementation levels, indicated that they had gone to class without a pencil, paper, book, or other necessary supplies one or more times.

Contrary to expectations, students from the Class of 2009 were more likely than those from 2011 to agree that information learned in school is useful in everyday life, and that information learned in school would be useful in college, training or career. In 2011, however, schools with medium policy implementation had higher percentages of seniors agreeing to those statements. Seniors in the Class of 2009 and in the Class of 2011 differed in their responses to all three statements. Specifically, more seniors in the Class of 2009 (64.5%) agreed that the information learned in school is useful in everyday life than seniors in the Class of 2011 (58.0%). Similarly, more

seniors in the Class of 2009 agreed that the information learned in school would be useful for college or further training (86.7%) and useful for a career (71.1%) than seniors in the Class of 2011 (83.3% and 65.5%, respectively). Again, 2011 seniors in medium policy implementation schools had greater agreement with the statement that most of the information learned in school is useful in everyday life (68.4%) than did seniors in the Class of 2011 from either high or low policy implementation schools (55.1% and 44.7%, respectively; $p<0.001$). This 68.4% can also be compared to the 64.2% response from seniors at all sample schools from the Class of 2009.

Similarly, seniors in the Class of 2011 from medium policy implementation schools had higher agreement with the statement that most of the information learned in school will be useful for a career (74.9%) compared to seniors from either high or low policy implementation schools (59.8% and 57.7%, respectively; $p<0.001$). This 74.9% can also be compared to the 71.1% response from seniors at all sample schools from the Class of 2009.

Agreement to the statement that most of the information learned in school will be useful for college or further training among seniors in the Class of 2011 from High, Medium, and Low EEDA LOI schools did not significantly differ with a majority agreeing or strongly agreeing (80.2%, 87.7%, and 80.4%, respectively; $p = 0.076$). These percentages are mostly lower than that of the Class of 2009 as seniors at all sample schools (86.7%). Larger percentages of CTE students (students who reported having taken three or more CTE courses by the end of twelfth grade) than their non-CTE peers saw that having a cluster and major made what they were learning more useful in life, more relevant to their future careers, and helped them get better grades. On the negative outcomes side, even though large percentages agreed that what they were learning was relevant, a higher percentage of 2011 CTE course taking students surveyed reported being absent from school five or more times than did non-CTE course taking (taking less than 3 CTE courses) seniors. This may indicate that acknowledgement of relevance of school material is not necessarily enough of a factor to counteract absenteeism, at least not completely.

This phenomenon of the medium policy implementation schools having responses more aligned with what would be expected in high policy implementation schools may indicate that with such comprehensive policies, focusing on just a few aspects and doing them well, at least at first, may produce better results than trying to cover all aspects but not covering any with much depth. These results also suggest that taking a number of CTE courses and being at a school with a high level of CTE program implementation may have had some influence on improving student attitudes toward school. There was, however, mixed evidence on the influence of these on improving attendance and discipline

POS and Career-Focused Activities

There was evidence that all of the Class of 2011 were receiving assistance with career exploration and planning, regardless of the number of CTE programs offered or the levels of CTE completers in those programs by school. When examining change in student outcomes, it is important to assess how much and which aspects of the policy intervention students at different schools were receiving and if these variables were related to the number of CTE programs offered or the levels of enrollment in those programs at each school. From several sources, we

determined that by the time they graduated, all members of the Class of 2011, if they had been at a school long enough, had developed an Individual Graduation Plan (IGP) that involved the selection of a career cluster to plan for. Across all schools, at least half of the Class of 2011 seniors self-reported on surveys that they had met with counselors on the development of their IGP plan and reported that their counselor was the most helpful in developing this career plan. In addition, the majority of 2011 seniors across all schools reported involvement in several types of career exploration activities, such as researching different careers and filling out career-related questionnaires, and reported having done some level of thinking and planning about careers through such things as taking classes or volunteering or interning in a job of interest. A majority of the Class of 2011 by their senior year, across all schools, reported being involved in at least one type of work-based learning experience. This indicates that at least at a minimum, all schools were implementing some of the basics of the EEDA for this early policy cohort and attempting to give students career exploration and work-based learning experiences.

There were some additional benefits, however, to students attending schools with more CTE programs or more CTE completers, in terms of access to some types of career-related information and experiences. According to student reports, some aspects of career planning appeared to be implemented at higher levels at schools with more CTE program offerings or that had more CTE completers. At these schools there was more evidence that students were aware of and involved in the IGP process and larger percentages were talking with counselors about finding a job after graduation as well as talking with counselors about the steps necessary to pursue a career. Larger percentages of students at schools with more CTE programs or completers also reported being in a class where someone from a local business talked about working at their company or taking a school-sponsored tour of a local business. This pattern across schools with varying CTE program implementation levels continued with reports of work-based experiences, with one exception. That exception was internships where higher percentages of students reported having internships at the low CTE program implementation schools than at the high CTE program implementation schools. This may be due to the fact that for internships, students were instructed on our survey to include any work experiences that were not necessarily tied to a class and many of the students may have considered any part-time jobs they may have had as internships.

These differences found between higher and lower CTE program implementation level schools suggest some differences in the level of development of the career planning processes at those schools. At least based on student reports, schools with more CTE programs or more CTE completers appeared to be giving students more in-depth assistance on career-planning as well as potentially more meaningful and relevant work-based learning experiences. Bringing in speakers or touring local businesses require more resources and strong partnerships to accomplish these and this may be due to more established partnerships at these high CTE implementation schools. Two of the high CTE program implementation schools (called high POS2 schools earlier in this report), Redwood and Azalea, were partnered with career centers that both had long-standing advisory committees for each of their programs and strong community and business partnerships to assist with offering these types of experiences for students. A third high CTE program implementation school, Iris, had the benefit of close ties with a local community college that also had built partnerships with local businesses to make these types of experiences possible.

Having taken three or more CTE courses by the end of twelfth grade also seemed to increase exposure to certain types of career exploration, planning and work-based learning experiences as compared to students who had not taken as many CTE courses. Although EEDA seems to have spread career planning and exploration experiences to more students, according to our surveys of twelfth graders, being in CTE courses still offered students more opportunities for career exploration, planning, and more work-based experiences. Larger percentages of seniors who reported taking three or more CTE courses by the time they were in the last semester of their senior year also reported thinking and planning about careers and being involved in job and career identification activities (including speaking with someone in a career of interest, being in a class with a local business person coming to talk, or taking a school-sponsored tour of a local business) than seniors who had taken less than three CTE courses.

We consistently found across sample schools that CTE teachers who were interviewed in early site visits were more likely to be familiar with clusters and majors, have more in-depth information on relevant careers in their areas, have partnerships with relevant businesses and were able to offer various related work-based learning opportunities for students in their courses.

One interesting note is that when asked about a list of work-based experiences, seniors who had taken three or more CTE classes reported participating in only one work-based experience (co-op) at higher rates than non-CTE seniors. In addition, contrary to assumptions that counselors may pay less attention to CTE seniors or channel them away from college, similar proportions of CTE and non-CTE seniors reported meeting with counselors more than three times and talking to counselors about a range of topics, including college.

Postgraduation Preparation and Plans

The success of a POS is tied to the seamless movement of a student from a clear pathway in high school directly into postsecondary training and/or education in the same pathway. This would mean that from the student's point of view, in order to complete a POS, there would at least be the potential for the student to choose one POS and concentrate in it through high school and then continue (or at least make plans to continue) in that same POS postgraduation, either through further education or training or employment. We collected data from two different sources on the postgraduation preparation and plans of our student groups (Classes of 2009 and 2011) in our sample schools: archival IGP data from the state longitudinal dataset and data reported by students on our student survey. From the state longitudinal dataset, we could see from IGP data students' intentions to complete their majors in high school (as opposed to simply declaring a major without intentions to complete); their patterns in switching majors from year to year; their patterns of course taking throughout high school; and their postgraduation plans if reported on the IGP. IGP data, however, were only available for the Class of 2011. We analyzed course data for both the Class of 2009 and the Class of 2011 from the state longitudinal dataset to determine the frequency of taking advance placement (AP) and dual credit or dual enrollment courses. From the student survey, we had self-reported data for both the Class of 2009 and the Class of 2011 related to taking courses in high school that carried college credit or had the potential to earn college credit; other preparation for postsecondary options; and self-reported postsecondary plans. Comparing the Classes of 2009 and 2011 from schools with varying levels of policy implementation allowed us to draw some broad conclusions as to the effect of the

EEDA policy on students' postgraduation preparation and plans. Comparing groups of students based on CTE concentration (and participating in sequences of CTE courses with postsecondary elements) allowed us to draw some conclusions as to the effect of POS on postgraduation preparation and plans.

LOI and college/dual credit. There was little difference between the Classes of 2009 and 2011 in our sample schools regarding reported college credit taking patterns, indicating overall and on average little change in this area. From the *Student Engagement/POS Experiences Survey*, the distribution of responses for the number of courses planned to take that will earn college credit by the time of high school graduation for seniors in the Class of 2009 and seniors in the Class of 2011 did not significantly differ with a majority in both classes indicating they would take one or more courses (56.3% and 54.4%, respectively). Seniors in the Class of 2009 and seniors in the Class of 2011 did not significantly differ in their responses to the number of times they took Advanced Placement courses, with approximately 45.0% of seniors in the Class of 2009 and 46.6% of seniors in the Class of 2011 indicating they had never taken these types of courses.

There were significant differences in college credit taking patterns among individual sample schools between the Class of 2009 and Class of 2011, and significant differences in patterns among schools in 2011, indicating that the policy and policy implementation levels could have had an impact on college credit taking patterns. Looking at the cohorts of students who were at each of our sample schools for at least three consecutive years, we found several instances where there were significant changes in AP course taking between the 2009 and 2011 cohorts. At the third and fourth highest policy implementation schools (Apple and Laurel), significantly more (15% and 11%, respectively) Class of 2011 students took AP courses compared to students in the Class of 2009. Contrarily, however, at the second highest policy implementation school, Orchid, there was a fairly large, but not as significant decrease in the percentage of students taking AP courses between the 2009 and 2011 cohorts. It should be noted however, that Orchid had the highest percentage of students taking AP courses in 2009 and actually had a small increase between the 2009 and 2011 cohorts on average credits taken or attempted per AP student. Elm, the lowest policy implementation school had a significant decrease in average AP credits taken or attempted per student between the 2009 and 2011 cohorts.

As for dual credit, the highest policy implementation school, Redwood, had a significant increase between the 2009 and 2011 cohorts regarding the percentage of students taking courses for dual credit (11%). There were no significant differences at any school between the two cohorts concerning average dual credit credits earned per student. There was a significant decrease in the percentage of students taking dual credit between 2009 and 2011 at Laurel (the fourth highest implementer), but as mentioned earlier, Laurel had a very significant increase in the percentage of students taking AP courses. Laurel also had fairly high percentages of students already taking dual credit prior to EEDA (in their Class of 2009), so increasing that would have been challenging. The challenge, however, was met by Redwood (already mentioned). Redwood, the highest policy implementation school, had the highest percentage, among our sample schools, of students taking dual credit in the 2009 cohort (29%), yet still managed to increase that to 40% of the 2011 cohort taking dual credit courses.

The findings from the surveys of students confirm a relationship between early EEDA policy implementation and college-credit course taking in high school. Seniors in the Class of 2011 from high, medium, and low EEDA policy implementation schools significantly differed in their responses to the number of courses they planned to take that would earn college credit by the time they graduate from high school, with more seniors in the Class of 2011 from low policy implementation schools indicating that they would take none of these courses (28.5%) compared to seniors in the Class of 2011 from high and medium policy implementation schools (16.5% and 13.9%, respectively; $p = 0.003$). Similarly, more seniors in the Class of 2011 from medium and low EEDA policy implementation schools reported they had never taken an Advanced Placement course (47.9% and 53.9%, respectively) compared to seniors in the Class of 2011 from the high policy implementation schools (40.2%; $p = 0.030$).

There was little difference as a whole or for individual schools between the Class of 2009 and the Class of 2011 in our sample schools regarding reported number of vocational courses taken. Responses of seniors in the Class of 2009 and seniors in the Class of 2011 did not significantly differ in terms of the number of times they had taken vocational, career, or technical courses, with approximately 27% of both classes indicating they had never taken these types of courses.

There was an increase in CTE programs, CTE program completers, and sequence takers between 2009 and 2011 and a slightly positive relationship with EEDA policy implementation levels at sample schools, suggesting that the policy and policy implementation could have had an impact on CTE sequence taking patterns. Four findings are related to evidence of increased course sequence taking between 2009 and 2011. Three involve CTE programs with concentrators at the sample schools. CTE programs were available to students at all sample schools in 2009 and students could participate, concentrate, or complete the programs. Both the number of CTE program completers and the ratio of CTE program completers to enrollment increased between 2009 and 2011 for the majority of the sample schools. The third variable related to CTE program offerings compared to enrollment at our sample schools. The ratio of CTE programs offered compared to school enrollment also increased between 2009 and 2011 for the majority of the sample schools. Overall, there was a positive relationship between policy implementation and increased CTE program completion and program offerings, although the relationship was not consistent for every school. The school with the most significant increases in both CTE program completion and program offerings between 2009 and 2011 was Laurel. Laurel was the school where staff told us that it was "built around EEDA."

The increase in sequence taking between 2009 and 2011 was supported by our Class of 2009 and Class of 2011 cohorts through state longitudinal data. The majority of sample schools had increases (though not statistically significant) in the percentages of students identified as having completed 4 or more credits in a logical CTE course sequence within a single career cluster with a postsecondary component. There was also a slightly positive relationship between the increases in this measurement of course-sequence taking and policy implementation levels at schools.

LOI had mixed impact on dual credit course-taking patterns. One of the high LOI schools, Redwood, had highly similar percentages of POS1 and non-POS1 in both cohorts as well as the highest percentages of both groups that took these types of courses. This school was also a high POS2 school and that may have been a result of elements put in place by implementation of the

reform policy. However, at the other high LOI school, Orchid, essentially no POS1 or non-POS1 students took dual credit courses in either cohort. The other two schools with the highest percentage of POS1 students who took dual credit courses were medium LOI schools. One of these, Iris, was also a high POS2 school and that may indicate that the school focused on certain aspects of policy implementation, particularly those that helped to develop POS and dual credit options. The two low LOI schools had different patterns in dual course-taking. At one of the schools, Elm, students in both cohorts took dual credit courses, but there were significantly fewer POS1 students who took these courses than non-POS1 students. At the other low LOI school, Poplar, few to no students from either cohort or POS1 groups took dual credit courses. It was not surprising to see these mixed results for LOI on dual credit or AB/IB course-taking patterns, because emphasis on development of these types of courses is only one part of the comprehensive EEDA reform policy.

POS and college/dual credit. CTE students (referring to POS1 students) and non-CTE students (non-POS1 students) identified in the state longitudinal dataset in both the 2009 and 2011 cohorts had different patterns in college credit course-taking. Significantly larger percentages of CTE students took dual credit courses and significantly larger percentages of non-CTE students took AB/IB courses. Although this was the general pattern, some important differences were found in course-taking patterns of CTE and non-CTE students by cohort across schools and by CTE program levels and EEDA policy implementation levels as well. Non-CTE students in both cohorts took AP/IB courses in all seven schools where these courses were available and there was a decrease in percentage of non-POS1 who had taken these courses at only three schools between the two cohorts and a significant increase at two schools. These changes between cohorts meant that there was a greater gap in AP/IB course-taking between CTE and non-CTE students by 2011.

Patterns of taking AP/IB by CTE students were mixed at schools with more CTE program offerings and more CTE completers and not associated with the school having a four-year college focus**.** The two schools with the highest percentages of CTE students identified in the state longitudinal dataset (POS1 students) who had taken AP/IB courses were Orchid and Laurel. Orchid ranked high in CTE program offerings and CTE program completers and Laurel ranked relatively low on these measures. Orchid was the only school where a similar percentage of 2011 CTE and non-CTE students took AP/IB courses. At the two other schools ranking high in CTE program implementation (Azalea and Redwood), very low to no 2011 CTE cohort students took AP/IB courses. At Redwood, there were lower percentages of CTE students than non-CTE students who took AP/IB in both the 2009 and 2011 cohorts. In addition, at this school the percentage of CTE students who took AP/IB courses between the 2009 and 2011 cohorts decreased whereas the percentage remained relatively stable for non-CTE students.

It is not clear what would produce the differences between these schools that ranked high in CTE program offerings and CTE completer numbers. There were not only traditional AP courses available at these schools but also Technical Advanced Placement (TAP) course options. It is possible that these TAP courses were not counted and/or identified in the same way on course files as other AP or dual credit courses and that could be a partial explanation for these large differences between the CTE students and non-CTE students in AP/IB course-taking at some of these schools.

There are several unique aspects of Orchid that may explain its higher percentages of CTE students participating in AP/IB courses. First, the school offered not only AP but IB courses during the study period. (Orchid was the only school in our sample that offered IB courses.) Second, we heard during interviews with staff that AP courses were being promoted to all students by counselors during course enrollment and by AP teachers. Finally, TAP, AP and IB courses at Orchid were available on campus or at the nearby community college whereas the TAP courses for the other two schools were primarily available through their partner career centers that were located further from the high school campuses.

The school with the second highest percentage of CTE students who had taken AP/IB courses was Laurel, a four-year college-oriented school. This school ranked low on the number of CTE program offerings and CTE program completers. Its four-year college focus may have influenced the course-taking of all students, including CTE students; however, this did not hold true at the other school with this orientation.

Apple had the third largest percentage of 2011 CTE students identified in the state longitudinal dataset who took AP/IB courses. The school was a high poverty school. None of the members of the 2009 cohort at Apple that were identified as CTE students took any AP/IB courses, but a relatively large percentage of CTE students in the 2011 cohort took these courses.. There was also a significant increase between the 2009 and 2011 cohorts in the percentage of non-CTE students who took AP/IB courses. The end result was that, even with the increase in 2011 CTE students taking these courses, there were still about twice as many non-CTE students as CTE students in this 2011 cohort who took AP/IB courses at Apple. It is not clear what changed at this school to produce the significant increases in AP/IB course-taking for both CTE and non-CTE students. It is possible the AP/IB options may have increased at this school between 2009 and 2011 or it may have been that more information was being disseminated about these courses to students, possibly through the IGP process.

Patterns of taking AP/IB by CTE students were also somewhat associated with levels of EEDA policy implementation. One of the high EEDA policy implementation schools, Orchid, was the only school where there were similar percentages of 2011 CTE (POS1) and non-CTE students who took AP/IB courses, almost one-quarter of students in both groups. However, at the other high EEDA policy implementation level school, Redwood, almost five times as many 2011 non-CTE students took these courses as did the 2011 CTE students. The other schools with the highest percentages of CTE students taking AP/IB courses were both medium EEDA policy implementation schools. At the two low policy implementation schools (Elm and Poplar), no CTE students in the 2011 cohort took any AP/IB courses, whereas one-fourth to one-third of non-CTE students from that cohort took them. Both schools had CTE students from the 2009 cohort who took AP/IB courses. We have no information on why this drop occurred for 2011 CTE students.

There was a large increase in dual credit course-taking for CTE students between the 2009 and 2011 cohorts identified in the state longitudinal dataset. The same was not true for the non-CTE students. Also, among students in the 2009 cohort, slightly more non-CTE students took dual credit than CTE students. However, the percentage of CTE students who took dual credit courses

almost doubled between 2009 and 2011, whereas the percentages of non-CTE students taking dual credit stayed about the same. This meant that for the overall 2011 cohort, a significantly larger percentage of CTE students took dual credit courses than did non-CTE students. Still, for both the 2009 and 2011 cohorts, among students taking dual credit courses, CTE and non-CTE students earned similar numbers of credits.

The significant increase in the percentage of CTE students who took dual credit courses between the 2009 and 2011 cohorts was mainly due to increases at two of the sample schools. Both of these schools ranked high in terms of the number of CTE program offerings and CTE completer status**.** The two schools that contributed the most to the increases in CTE dual credit course taking were Iris and Redwood. Iris and Redwood had by far the highest percentages of 2011 cohort CTE students who took dual credit courses. Also, both were schools where the team identified study-defined Perkins IV POS that met all of our definitional requirements for POS.

At Iris, twice as many CTE course sequence takers (POS1 students) as non-CTE students took dual credit courses. The percentage of CTE students who took dual credit almost tripled between the 2009 and 2011 cohorts, whereas the percentage for non-CTE students remained about the same. Note that Iris was found to have three of the nine programs that met all of our definitional elements to be called Perkins IV POS. At the other school, Redwood, percentages of CTE and non-CTE students who took dual credit courses increased between the 2009 and 2011 cohorts. Around 40% of both CTE and non-CTE students in the 2011 cohort took dual credit courses. Note that Redwood was the school with strong ties to a partner career center and local community college and the one where the team identified six of the nine programs that met all of our definitional elements to be called Perkins IV POS. Redwood was also the highest EEDA policy implementation school.

In contrast, at both of the other two schools that ranked high in terms of CTE program offerings and CTE program completers, no CTE students (as defined in the state dataset as course sequence takers or POS1 students) took dual credit courses in either the 2009 or 2011 cohort. The other school with a slight increase in dual credit taking by CTE students between the 2009 and 2011 cohorts was a medium CTE program offerings and completer rate school, Elm. At this school, however, even though there was an increase in percentage of CTE students who took dual credit courses, there were still three times as many non-CTE (non-POS1) students taking dual credit at this school as CTE students.

One of the schools that ranked low in terms of CTE program offerings and CTE program completion rates had some of the highest percentages of CTE students (and non-CTE students) who took dual credit courses. Laurel, the school "built around EEDA," focused on building POS, and dual credit appeared to be a part of this development. However, between the 2009 and 2011 state dataset cohorts, the percentages of both the CTE and non-CTE students who took dual credit courses declined.

During the 2008-2009 school year, counselors at all of our schools told us that their schools offered some dual credit/dual enrollment options across different majors and CTE programs. There were a variety of articulation agreements in place and schools and districts were working to update old agreements and draw up new ones. Schools told us they were working on

improving dual credit options for students and also hoped to benefit more from the statewide articulation agreements that were being developed. As of 2008-2009, there were 86 universally transferable courses, either already developed or nearly developed, that would easily allow the transfer of credits for those courses among all two- and four-year public institutions of higher learning across the state, including all technical colleges.

Although there seemed to be at least discussion about dual credit options at all sample schools and efforts to update and/or increase the number of agreements, only four sample schools had any substantial number of students who took dual credit courses in either the 2009 or the 2011 cohort among both the CTE and non-CTE students. At three of these four schools (Iris, Laurel, and Redwood), larger percentages of 2011 CTE students took dual credit courses than non-CTE students but larger percentages of non-CTE students took dual credit courses in the 2009 cohort. At the fourth school (Elm), much larger percentages of non-CTE students took dual credit courses than did CTE students in both cohorts. At three of these four schools, the percentages of CTE students taking dual credit courses increased between the 2009 and 2011 cohorts.

At three other sample schools, Apple, Orchid, and Poplar, few to no CTE (POS1) or non-CTE (non-POS1) students were taking dual credit courses in either the 2009 or 2011 cohort, although we were told at least a few options were available at all three schools. At one of these schools, Apple, neither CTE nor non-CTE students took dual credit courses. Even though it was considered medium in rank concerning CTE program offerings and CTE program completers, there were few dual credit options for students at this school. At the other two schools, Orchid and Poplar, there were options available to students. But again, given the small number of students identified as having been at Poplar for three consecutive years and having completed a 4 or more logical course sequence in one career cluster (a POS1 student), discerning patterns at that school would be misleading.

At the final school, Azalea, a small percentage of non-CTE students from both the 2009 and 2011 cohorts took dual credit courses whereas none of the CTE students in either cohort took these courses. It is difficult to say if this is a trend given the fact that fewer than 10 CTE course sequence takers, as defined by this study, were identified in the 2009 and 2011 state dataset cohorts at this school.

Patterns of taking AP/IB by CTE students were mixed at schools with more CTE program offerings and more CTE completers and not associated with the school having a four-year college focus**.** The two schools with the highest percentages of CTE students identified in the state longitudinal dataset (POS1 students) who had taken AP/IB courses were Orchid and Laurel. Orchid ranked high in CTE program offerings and CTE program completers and Laurel ranked relatively low on these measures. Orchid was the only school where a similar percentage of 2011 CTE and non-CTE students took AP/IB courses. At the two other schools ranking high in CTE program implementation (Azalea and Redwood), very low to no 2011 CTE cohort students took AP/IB courses. At Redwood, there were lower percentages of CTE students than non-CTE students who took AP/IB in both the 2009 and 2011 cohorts. In addition, at this school the percentage of CTE students who took AP/IB courses between the 2009 and 2011 cohorts decreased whereas the percentage remained relatively stable for non-CTE students.

It is not clear what would produce the differences between these schools that ranked high in CTE program offerings and CTE completer numbers. There were not only traditional AP courses available at these schools but also TAP course options. It is possible that these TAP courses were not counted and/or identified in the same way on course files as other AP or dual credit courses and that could be a partial explanation for these large differences between the CTE students and non-CTE students in AP/IB course-taking at some of these schools.

There are several unique aspects of Orchid that may explain its higher percentages of CTE students participating in AP/IB courses. First, the school offered not only AP but IB courses during the study period. (Orchid was the only school in our sample that offered IB courses.) Second, we heard during interviews with staff that AP courses were being promoted to all students by counselors during course enrollment and by AP teachers. Finally, TAP, AP and IB courses at Orchid were available on campus or at the nearby community college whereas the TAP courses for the other two schools were primarily available through their partner career centers that were located further from the high school campuses.

The school with the second highest percentage of CTE students who had taken AP/IB courses was Laurel, a four-year college-oriented school. This school ranked low on the number of CTE program offerings and CTE program completers. Its four-year college focus may have influenced the course-taking of all students, including CTE students; however, this did not hold true at the other school with this orientation.

Apple had the third largest percentage of 2011 CTE students identified in the state longitudinal dataset who took AP/IB courses. The school was a high poverty school. None of the members of the 2009 cohort at Apple that were identified as CTE students took any AP/IB courses, but a relatively large percentage of CTE students in the 2011 cohort took these courses.. There was also a significant increase between the 2009 and 2011 cohorts in the percentage of non-CTE students who took AP/IB courses. The end result was that, even with the increase in 2011 CTE students taking these courses, there were still about twice as many non-CTE students as CTE students in this 2011 cohort who took AP/IB courses at Apple. It is not clear what changed at this school to produce the significant increases in AP/IB course-taking for both CTE and non-CTE students. It is possible the AP/IB options may have increased at this school between 2009 and 2011 or it may have been that more information was being disseminated about these courses to students, possibly through the IGP process.

Patterns of taking AP/IB by CTE students were also somewhat associated with levels of EEDA policy implementation. One of the high EEDA policy implementation schools, Orchid, was the only school where there were similar percentages of 2011 CTE (POS1) and non-CTE students who took AP/IB courses, almost one-quarter of students in both groups. However, at the other high EEDA policy implementation level school, Redwood, almost five times as many 2011 non-CTE students took these courses as did the 2011 CTE students. The other schools with the highest percentages of CTE students taking AP/IB courses were both medium EEDA policy implementation schools. At the two low policy implementation schools (Elm and Poplar), no CTE students in the 2011 cohort took any AP/IB courses, whereas one-fourth to one-third of non-CTE students from that cohort took them. Both schools had CTE students from the 2009

cohort who took AP/IB courses. We have no information on why this drop occurred for 2011 CTE students.

There was a large increase in dual credit course-taking for CTE students between the 2009 and 2011 cohorts identified in the state longitudinal dataset. The same was not true for the non-CTE students. Also, among students in the 2009 cohort, slightly more non-CTE students took dual credit than CTE students. However, the percentage of CTE students who took dual credit courses almost doubled between 2009 and 2011, whereas the percentages of non-CTE students taking dual credit stayed about the same. This meant that for the overall 2011 cohort, a significantly larger percentage of CTE students took dual credit courses than did non-CTE students. Still, for both the 2009 and 2011 cohorts, among students taking dual credit courses, CTE and non-CTE students earned similar numbers of credits.

The significant increase in the percentage of CTE students who took dual credit courses between the 2009 and 2011 cohorts was mainly due to increases at two of the sample schools. Both of these schools ranked high in terms of the number of CTE program offerings and CTE completer status. The two schools that contributed the most to the increases in CTE dual credit course taking were Iris and Redwood. Iris and Redwood had by far the highest percentages of 2011 cohort CTE students who took dual credit courses. Also, both were schools where the team identified study-defined Perkins IV POS that met all of our definitional requirements for POS.

At Iris, twice as many CTE course sequence takers (POS1 students) as non-CTE students took dual credit courses. The percentage of CTE students who took dual credit almost tripled between the 2009 and 2011 cohorts, whereas the percentage for non-CTE students remained about the same. Note that Iris was found to have three of the nine programs that met all of our definitional elements to be called Perkins IV POS. At the other school, Redwood, percentages of CTE and non-CTE students who took dual credit courses increased between the 2009 and 2011 cohorts. Around 40% of both CTE and non-CTE students in the 2011 cohort took dual credit courses. Note that Redwood was the school with strong ties to a partner career center and local community college and the one where the team identified six of the nine programs that met all of our definitional elements to be called Perkins IV POS. Redwood was also the highest EEDA policy implementation school.

In contrast, at both of the other two schools that ranked high in terms of CTE program offerings and CTE program completers, no CTE students (as defined in the state dataset as course sequence takers or POS1 students) took dual credit courses in either the 2009 or 2011 cohort. The other school with a slight increase in dual credit taking by CTE students between the 2009 and 2011 cohorts was a medium CTE program offerings and completer rate school, Elm. At this school, however, even though there was an increase in percentage of CTE students who took dual credit courses, there were still three times as many non-CTE (non-POS1) students taking dual credit at this school as CTE students.

One of the schools that ranked low in terms of CTE program offerings and CTE program completion rates had some of the highest percentages of CTE students (and non-CTE students) who took dual credit courses. Laurel, the school "built around EEDA," focused on building POS, and dual credit appeared to be a part of this development. However, between the 2009 and 2011

state dataset cohorts, the percentages of both the CTE and non-CTE students who took dual credit courses declined.

During the 2008-2009 school year, counselors at all of our schools told us that their schools offered some dual credit/dual enrollment options across different majors and CTE programs. There were a variety of articulation agreements in place and schools and districts were working to update old agreements and draw up new ones. Schools told us they were working on improving dual credit options for students and also hoped to benefit more from the statewide articulation agreements that were being developed. As of 2008-2009, there were 86 universally transferable courses, either already developed or nearly developed, that would easily allow the transfer of credits for those courses among all two- and four-year public institutions of higher learning across the state, including all technical colleges.

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At the final school, Azalea, a small percentage of non-CTE students from both the 2009 and 2011 cohorts took dual credit courses whereas none of the CTE students in either cohort took these courses. It is difficult to say if this is a trend given the fact that fewer than 10 CTE course sequence takers, as defined by this study, were identified in the 2009 and 2011 state dataset cohorts at this school.

The patterns found in course-taking between POS1 and non-POS1 students and changes across the cohorts reflect changes in choices that these students made about what route to go in high school. Students, parents, and counselors often had to weigh the tradeoffs for students in choosing the types of courses they would take in light of course availability and scheduling. With many core requirements and just seven elective credits, students in our two cohorts had few options for dual credit courses. Choices were often limited by the availability of courses,

especially for TAP options in CTE courses (similar to AP options for core academic courses), scheduling conflicts, and the academic requirements to enroll in AP and IB courses. Many POS1 students (as well as non-POS1 students) faced the choice of either taking the CTE courses required to complete a POS2 program or completing advanced college-prep or honors academic courses to be able to get into more selective colleges. We understood from several schools that they were trying to increase TAP and dual credit options for a variety of CTE programs. Because we were unable to collect data on these options at the end of the study period, we were not able to explore any changes that may have occurred at schools in the availability of these courses across majors/programs.

EEDA, POS, and Plans for Postgraduation Education, Work, and Careers

Seniors in the Classes of 2009 and 2011 differed significantly regarding the highest level of education they expected to complete. When surveyed in their last semester of high school, seniors in the class of 2011 were more likely than those in 2009 to report that having a high school major made them less likely to want to drop out of high school. Nevertheless, more seniors in the Class of 2011 indicated that they would not finish high school (4.7%) compared to seniors in the Class of 2009 (2.2%; $p = 0.008$). However, fewer seniors in the Class of 2011 said the highest level of education they planned to complete was a high school diploma or GED (9.2% compared to 12.3% for the Class of 2009). Over three-fourths of the seniors in both classes indicated they would enroll in a four-year college or university, enroll in a two-year community college, or enroll in a two-year college and then transfer to a four-year college/university the year after graduating from high school (79.2% and 78.1%, respectively).

When analyzed by CTE participation, CTE course sequence takers identified in the state dataset (POS1 students) were more likely to plan to enroll at a two-year college after graduation whereas those not in a CTE course sequence were more likely to plan to enroll at a four-year college. Trends also varied widely across schools for the students identified as being in a CTE course sequence (a POS-like measurement). At only one school, Poplar, were all students, regardless of CTE sequence status, planning to go on to either a two- or four-year college. At the other schools, percentages varied, with the lowest percentage expecting to go on to four-year college at Elm and the highest percentage at Orchid. Azalea had the highest percentage of students not planning to go to college, followed by Apple. Apple is a high poverty schools and that may have influenced students' expectations. The reason for the low percentage at Azalea isn't as clear. It ranked on the high side in terms of CTE program offerings and CTE completer status and was in a moderate poverty community. It is located in a rural area, however, and that may have influenced student expectations.

Seniors in the Class of 2011 from high, medium, and low EEDA policy implementation schools significantly differed in their responses regarding the highest level of education they expected to complete. More seniors from low policy implementation schools indicated that they expected to complete at least a bachelor's degree (75.8%) than seniors from high and medium EEDA policy implementation schools (64.5% and 64.9%, respectively; $p = 0.049$). This is consistent with some of our findings related to college preparation emphasis over traditional CTE and career preparation emphasis at some of the lower policy implementation schools. Overall student

survey reports of educations expectations were similar for CTE students (reporting having taken three or more CTE courses by their senior year) and non-CTE students.

College aspirations were not consistently associated with the levels of CTE program offerings and CTE completers in our sample schools. Three of the four schools with the highest percentages of students planning to enroll in a four-year college were high CTE program implementation schools (Orchid, Iris, and Redwood). However, the school with second highest percentage of students planning to enroll in a four-year college, Laurel, was a low CTE program implementation school. In addition, the second lowest percentage of students planning to enroll in a four-year college was at a high CTE program implementation school, Azalea.

One clear pattern at the two schools ranking low in terms of CTE program offerings was a significantly larger percentage of students at these schools planned on attending four-year colleges. Although these were our most four-year college-oriented schools, one was oriented toward career clusters and trying to build CTE programs (Laurel), whereas at the other (Poplar), CTE was reported to carry a stigma. Regardless, it appears that the orientation of these schools toward college attendance influenced all students. It also could be the case that, given the pressure at these schools to attend college, that some students felt compelled to report a plan to enroll in college to their counselor but did not actually intend to enroll.

Plans to enroll in college were associated with the career cluster of a student's POS. Almost 90% of the Business, Management, & Administration CTE course sequence takers reported plans to enroll in a four-year college. Less reported plans to enroll in a two-year college or at no college compared to all other clusters with enough students to discern patterns. The Business, Management, and Administration cluster also had the most diverse CTE programs of any cluster in our sample schools, but these CTE programs were not always tied directly to postsecondary programs, according to staff reports. High percentages of 2011 cohort Health Sciences course sequence takers identified in the state database also reported plans to enroll in a four-year college but also a sizable number of these students were also planning to enroll in a two-year college. During interviews and from reports on the study-created POS checklists, it was apparent that students in the Health Sciences cluster had a number of certificate and degree options at both two and four-year colleges. It is also interesting to note that this cluster offered at least one certificate option (CNA) at the high school level that could lead directly to employment after graduation and often offered a second option, preparation for the Pharmacy Technician certificate, for which students could become eligible to take the certification exam after they graduated. Yet these students still planned to enroll in college. These two clusters (Business, Management, and Administration and Health Sciences) also had the lowest percentages of students not planning to enroll in college. All of the Art, AV Tech, & Communications course sequence takers planned to enroll in college, the only cluster where all of the students had such plans. The most popular CTE program in this cluster was Graphic Communications.

Transportation, Distribution, & Logistics course sequence takers were the least likely to plan to enroll in a four-year college; however, slightly over half planned to enroll in a two-year college. This pattern seems consistent with the fact that the cluster offered a number of certificate options, such as Automotive Technology and Automotive Collision Repair Technology, for students who continued this high school pathway into two-year programs. Agriculture, Food, &

Natural Resources course sequence takers were least likely to plan to enroll in any college; one-third did not plan to enroll in college. The most popular CTE program in this cluster was Horticulture and only one of our sample schools offered a certificate at the high school level in this area (golf course management). The Agriculture, Food, & Natural Resources cluster had CTE concentrators at four of our sample schools during the study period and included rural and suburban schools with options for two-year programs near all of the schools. Two of the four schools with a CTE program in this cluster were high poverty schools, one was a medium poverty school, and the other was a low poverty school.

EEDA policy may be resulting in more student awareness and identification of specific career goals for the future. More seniors in the Class of 2011 indicated they plan to have a job at age 30 years and provided a legitimate job name (69.6%) than seniors in the Class of 2009 (52.7%). Fewer seniors in the Class of 2011 (21.7%) indicated that they plan to have a job but didn't know what type of job they would have compared to the Class of 2009 (39.1%) indicating the same. The distribution of responses between seniors in the Class of 2009 and seniors in the Class of 2011 indicating they plan to have a job at age 30 significantly differed ($p<0.001$). The differences lay mainly in the ability to identify the type of job they might have.

A majority of the seniors in the Class of 2011 from high, medium, and low EEDA policy implementation schools indicated that they planned to have a job at age 30 and could provide a legitimate job name (69.8%, 68.8%, and 70.7%, respectively) . The high policy implementation schools had the greatest percentage point gain (21.2%) between 2009 and 2011 on this response; the medium policy implementation schools had the next highest percentage point gain (18.2%) on that response; and the low policy implementation schools had the lowest, though still large, gain (10.5%). These data tend to point to the policy as helping students to identify specific career goals for their futures.

POS and Postgraduation Preparation

Students who stated their intention to complete a high school major on at least one IGP in three years at a high school were more likely to complete a CTE course sequence, but only a minority of those with such intentions ended up completing a CTE sequence at that school. (Recall that for student-level course taking analysis, we did not have official CTE program information and had to rely on identifying logical CTE course sequences with postsecondary linkages.) In addition, having larger percentages of students reporting the intent to complete a major at a school did not consistently lead to having larger percentages of CTE course sequence completers at that school. In fact, the opposite pattern was more often the case; schools with the highest percentages of students reporting the intent to complete a major had lower, if not the lowest percentages of CTE course sequence completers. At only two schools, Iris and Redwood, were the percentages of students reporting the intent to complete majors similar to the percentages completing CTE course sequences. These two schools ranked high in CTE program offerings and numbers of CTE program completers at the schools, and that may have had some influence on the consistency between IGP intentions and actual outcomes related to CTE course sequence taking. This pattern was not found at two other schools that ranked high in CTE program offerings and numbers of CTE program completers, where there were much higher percentages of students reporting on their IGPs the intent to complete a major than those actually able to

complete a CTE course sequence. Because students in South Carolina are not required to complete a major in order to graduate, this is not necessarily a surprising finding. This lack of association at most schools between intent and completion may reflect the fact that at many sample schools this element on the IGP was merely presented as an option or suggestion and not as a critical part of the IGP, as was evidenced in the large percentages of students at many sample schools who did not even designate whether they intended to complete or just declare a major.

A sizable portion of CTE course sequence completers switched IGP career clusters between tenth and twelfth grades but many still completed a CTE course sequence by graduation. The students in our state longitudinal dataset who were identified as CTE course sequence completers (POS1 students) were less likely than non-POS1 students to have switched career clusters between tenth and twelfth grades. This is not surprising because staying in the same cluster over the three years increased the chances that a student would take the courses necessary to complete the sequence. However, approximately 40% of CTE course sequence completers (POS1 students) completed a CTE course sequence outside of the career cluster noted on their tenth-grade IGP. So, even though this 40% switched clusters, they still managed to complete a CTE course sequence.

The percentage of students completing a CTE course sequence in a cluster different from that on their tenth-grade IGP varied widely across sample schools. And these patterns were not consistently linked to the level of number of CTE program offerings or the number of CTE program completers at schools. One of the high ranking schools in regards to CTE program implementation, Orchid, had the largest percentage of students completing CTE course sequences in career clusters different from the ones on their tenth-grade IGP. The other three high ranking schools in regards to CTE program implementation, however, did have lower percentages switching than many of the other sample schools. On the other hand, the school with the next to the lowest percentage of students switching majors was not very advanced in CTE program offerings or CTE program completion rates.

Some of the apparent switching of clusters may be due to the courses that the study team identified as a logical progression from a single career cluster. The actual career major and cluster and courses that were considered a part of this major on a student's IGP may differ from those identified by researchers and thus students may appear to have switched clusters when in fact they did not.

The issue of switching of clusters during high school is an important one because it reflects different philosophies of the role of the selection of a career cluster and major/POS while in high school. For OVAE, one of the measures of success of a POS is that students stay in the same POS from high into postsecondary education and training. Another philosophy advocates allowing students to "try out" areas early, while in high school, so that they do not waste time and money later to find out where their interests lie. The switching of clusters on IGPs indicates that students are being given flexibility that allows them to try out different areas and change areas when they find out that they may not be interested in or suited for a particular area, or move to another focus area for other reasons, such as changing into a POS when more courses are available.

Staff members at a number of our sample schools were glad that students could start thinking about future careers earlier and have the opportunity to try out areas that might be of interest. At some schools, there was more pressure than at others to pick a major/cluster and stick with it throughout high school, to complete the requirements for the major. At these schools, many of the staff and students interviewed mentioned that students felt pressured and often felt "trapped" in areas they no longer were interested in. Staff at these schools often mentioned that parents complained about this as well. Students interviewed across sample schools seemed to prefer to be able to "try out" different areas and be able to change rather than be forced to stick with an area in which they were no longer interested. Other schools were more flexible and focused on making sure students could test out areas and be able to rule out areas in high school before wasting time and money on them in college.

Emergent Themes

As we observed at schools over the five-year study period and collected and analyzed qualitative and quantitative data from a variety of sources, 12 overarching themes emerged that sum up the major findings from this study. Our summary stated are presented below and briefly discussed.

1. **Career-focused activities at all sample schools increased over the period of EEDA policy implementation.**

EEDA policy increased the amount and variety of career-focused activities and guidance at the sample high schools, with school counselors playing key roles in providing these activities. The amount, nature of the events, and the types of career experiences they provided for students varied across sample schools. All schools had developed career clusters and majors and required students to select a career cluster and develop an Individual Graduation Plan. Schools reported being more focused on career planning for their students, working to provide students work-related experiences, and trying to offer more real-world examples in classrooms. School counselors reported an increase in one-on-one counseling sessions with students about career exploration and planning, with a goal of meeting with each student each year to either develop or revise Individual Graduation Plans and were increasing efforts to engage and inform parents in their child's career and educational planning. Counselors were conducting career development and guidance workshops for teachers, guidance personnel, and work-based constituents. Schools were in various stages of implementing the High Schools That Work reform model. All eight of the schools participating in our study reported either dual enrollment or dual credit arrangements, or both, with local postsecondary institutions.

2. **Initial increased funding and the addition of staff for the enhanced guidance model at schools helped launch the state policy's implementation. Subsequent cuts in funding were reported to have slowed the program's progress and caused schools to make difficult choices relative to setting priorities for allocating scarce resources.**

Initial site visits to schools provided data on myriad new activities being implemented and information being disseminated relative to the EEDA policy and its potential to benefit students, industry, the community, and beyond. The timing of the implementation of the policy was

unfortunate in that it occurred at the same time the state and nation were experiencing the beginning of a long, severe recessionary period. State funding reports showed that funding was not kept up to the degree necessary to fully fund the policy's successful implementation. Schools also reported that teachers' jobs were on the cutting block, making the newly met low student to guidance ratios more difficult to justify as a priority. Professional development related to the policy, although strongly noted in our initial site visits, undoubtedly suffered later with inadequate funding. Still local educators who were enthusiastic to make career-focused education work for their students were able to sustain much of the policy at their schools and, indeed, we did see positive indications of the policy's effects in the 2011 cohort data.

3. A broad range of resources is required for successful implementation of such a comprehensive reform policy.

To ensure success of such an ambitious and high-cost reform, there needs to be sufficient financial support for schools and consideration of economic realities. For example, major resources are required to reorganize curriculum and implement the time-consuming, staff intensive guidance component. Not surprisingly, schools that had access to a wide variety of resources facilitated policy implementation, such as staff with prior knowledge of and experience with various policy areas or location in a community with diverse local businesses willing to provide resources and educational opportunities for students. Most districts, however, were hard pressed to hire additional staff to handle the newly mandated duties and several schools lacked some of the basic resources necessary to design and implement POS. Full implementation of the EEDA model requires a commitment to the provision of adequate funds to fully staff the initiative.

4. Exposure to EEDA policy benefitted students across our sample schools, even at schools with lower levels of policy implementation.

From surveys and focus groups with students and discussions with school staff, it was obvious across schools that students in the Class of 2011 were benefitting in a variety of ways from implementation of EEDA policy. Through the Individual Graduation Plan (IGP) process, students gained important skills in planning for careers and post-high school life. Most students interviewed felt fortunate that there was a process in place to help them think about and develop future career goals and that they could then select courses based on these goals. Some students noted that they appreciated getting realistic feedback on requirements of different careers and how these fit with their skills and interests. Some commented that they appreciated being able to meet one-on-one with counselors and on surveys reported counselors as the most helpful in developing their IGP. Many of 2011 seniors interviewed reported that being able to select courses based on their interests made them more motivated to come to school and do well in their courses. During focus groups, some of these seniors also commented that having the opportunity to be exposed to different majors and to find out about different occupations available within those majors was very helpful in assisting them to sharpen their focus toward their career goals.

Student survey responses were similar, where a majority of students surveyed reported that having a career major and cluster to plan for made them more likely to want to come to school,

less likely to drop out, helped them get better grades, and helped them make connections between what they were studying and the type of career they wanted. The majority of students surveyed also had participated in at least one work-based learning experience during high school.

Overall, from survey data (supported by focus group interviews), students indicated increased awareness of connections being made between what they were being taught in high school and what their postgraduation options might be, and increased engagement to school as well. As one 2011 senior noted in a focus group interview when asked about the IGP process and selecting a career cluster or major in high school, "I think it made me more motivated to like the classes that I was in. This is going to help you in the long run, for when you're in college and stuff." Another 2011 senior explained, "I know that my grades have been really, really good in this particular program, because it's something I'm actually interested in, and I like doing. It's kind of easy to do, because you're interested."

5. EEDA policy increased awareness and knowledge of CTE at sample schools.

The state policy increased school personnel and student awareness and knowledge of CTE programs and their importance to POS. Counselors reported that the Individual Graduation Plan process had increased their awareness and knowledge of CTE courses and programs, particularly at schools that were partnered with career centers and/or local technical colleges which offered these types of courses. The policy also resulted in wider dissemination of information on CTE programs to students, parents, and other educators. CTE teachers interviewed in some sample schools reported not only an increase in numbers of students being directed into their courses but also more appropriate placement of students in their courses and programs. These teachers credited these changes to the increase in knowledge of CTE by counselors and the IGP process that was facilitating more appropriate placement of students in courses based on interest and ability levels. At several sample schools it was also reported that any stigma associated with taking CTE courses or attending a career center had been reduced and attributed this reduction to policy efforts, although stigma persisted at other study schools. Some schools reported increased interactions between CTE and non-CTE teachers as a result of the policy implementation, but particularly among those implementing the High Schools That Work and/or Smaller Learning Communities reform models.

6. Components of the EEDA policy were helping to build some of the foundational elements and framework for the development and successful implementation of Perkins IV-defined POS.

Although we did not find many POS at sample schools that met all of the study-defined criteria for the Perkins IV core elements, our qualitative data revealed that components of EEDA were helping to build some of the foundational elements and framework considered necessary for the development and successful implementation of Perkins IV type POS. Various foundational elements were being put into place across our sample schools leading to the potential for the development of more POS in schools over time. EEDA encourages alignment of secondary and postsecondary elements and this was happening to some degree at sample schools, particularly in schools with strong CTE programs and close ties to career centers and/or local two-year colleges. The identification of and development of career majors and the mandate to increase work-based

learning experiences for students were facilitating collaboration between schools and local businesses. EEDA, the High Schools That Work model, and the Smaller Learning Communities reform model were facilitating academic and CTE integration. Some integration of CTE and academic content was occurring through individual teachers' efforts as well. Although EEDA does not require a direct link between a career major and a postsecondary credential, there were still a number of career majors at every school that were reported to have postsecondary components culminating in credentials, certificates, or degrees at the postsecondary level. All eight of our sample schools reported having at least a few dual enrollment agreements and credit transfer options with local postsecondary institutions in place during the time of our first site visits and all planned to continue to develop these options across a number of subject areas in the future.

7. The expanded Perkins IV model of POS is relevant across the curriculum, not just for CTE programs.

CTE program elements and the expanded Perkins IV model can direct career-focused education for all students, regardless of subject area. Linking secondary and postsecondary programs, providing contextual learning, building business and community partnerships to provide students work-based learning experiences, and emphasizing integration of rigorous academic and technical content are critical to all subject areas. In addition, CTE and non-CTE students and students at all performance levels need the benefits of career guidance and goal setting and being able to connect what happens in school to what comes after high school graduation.

In student focus groups, we interviewed a number of students who were not involved in CTE courses. Some of the students likely to go to college often reported obtaining more realistic feedback about the pros and cons of different careers and subject areas and felt they were going to be able to make more informed choices because of going through the Individual Graduation Plan process. This often meant that a student found through this process that they were not suited for the area that they had planned to pursue in college and were able to explore other options prior to graduation. Other students were able to increase their focus on aspects of a subject area they would pursue in college, such as which aspect of the law they wanted to study or what area of engineering.

8. Building on existing programs and whole-school reform efforts helped to facilitate development and implementation of POS.

Having the ability to build on existing programs seemed to be particularly important to successful early policy implementation in sample schools and in the development of POS. We found evidence that schools with stronger CTE programs pre-EEDA were more likely to have Perkins-defined POS in place. Groups of teachers at several schools mentioned that the development of their school's career clusters and majors was primarily accomplished by the school's CTE faculty, because they had experience with these due to Perkins policies. Teachers with CTE backgrounds seemed to possess the necessary knowledge and confidence to take leadership roles in developing quality courses for POS. One of the schools that was found to have study-defined Perkins IV POS had been developing and implementing quality CTE programs in conjunction with the local technical college for a number of years prior to EEDA.

Policy and POS implementation was also facilitated when accomplished in conjunction with other initiatives that shared complementary goals and/or established the structure and culture for success. Many schools found elements of HSTW to be highly compatible with different facets of the state policy. Some primary elements noted by staff and teachers included the modules developed to help implement the 10 HSTW key practices, the technical assistance and professional development provided by the Southern Regional Education Board to assist with HSTW implementation, the advisor-advisee program, and the assistance the model provided in developing career pathways and ways to integrate career content into coursework. One principal told us that a key reason for electing to implement HSTW was that it would help make a "seamless transition with EEDA."

The two schools with the highest levels of both policy and POS implementation both had high levels of implementation of the High Schools That Work reform. One of these schools had also incorporated Smaller Learning Communities in with EEDA and HSTW and had organized their learning communities around career clusters. In addition, one of the schools that had the most steady growth in POS implementation over the study period had also placed emphasis on incorporating both the High Schools That Work and Smaller Learning Communities models into their policy implementation. Finally, the other school that was found to have study-defined Perkins IV POS was one of the earliest implementers of High Schools That Work and had had the model in place for such a long time that they considered it as part of the fabric of their school.

9. **Structured guidance for career planning and academic advisement was a critical underlying element for policy implementation and student participation in career planning and POS**.

The strong emphasis on combining both career-focused guidance and academic advisement in EEDA and the requirements of the Individual Graduation Plan (IGP) process were fundamental to policy implementation. The EEDA policy required a major shift in the focus of guidance counselors from testing and scheduling courses to assisting students with identifying their career interests and helping them to plan their courses and future work and education around these interests. Counselors offered students career development activities such as exploration and interest assessments, as well as opportunities to talk about career issues and career options with knowledgeable adults. The IGP process was seen by staff and students as an essential service and increased the amount of time counselors in our sample schools spent with students engaging in one-on-one career-based counseling. There was an increased effort to meet with every student on an annual basis. This career-focused guidance approach increased the depth and breadth of information that students received about their educational and career opportunities in career and technical fields and was an essential channel for dissemination of information to students on available POS. Further, there was a greater effort to promote CTE programs to students and engage parents in the course and career planning of their children.

Several counselors indicated that the students may not have a clear idea as to what they want to do for their long-term career, but that the process helped students to consider postsecondary options and "to have a goal when they graduate from high school…I may not know for sure what

it is right this second [what I want to do], but I know what I want to do as far as the education that I want to get" (e.g., 2-year, 4-year degree).

Another counselor stated, when speaking of her school's career development efforts with students, "We want to know where you [students] want to go, what you [students] want to do, what your [students'] career goals are, and we try to put as many resources in their [students'] hands…"

When asked to describe what students sought from career guidance, one counselor commented, "…I think they need us more. There are so many choices out there. I think it can be overwhelming and confusing to them. Just to jump off into the world--'What am I doing? Where am I going? I just don't know! Help me!' I think that what we do is vital and very important and I feel like we are doing more with EEDA and it's very needed and beneficial."

Further, it is evident to the counselors that the students may not persist with certain goals at this stage in their development, but that the process of setting goals is important to the career exploration and development process. One counselor stated, "We're trying to help these kids form a goal whether it's a goal that's going to last throughout their entire lifetime we can't say, the process of making a goal and following through on it, however, is a good thing to learn."

10. The Individual Graduation Plan and development process emerged as an essential component of policy implementation and the promotion of POS.

The development and maintenance of students' four-year Individual Graduation Plans (IGPs) emerged as an essential component of EEDA policy implementation and the promotion of POS in general**.** Guidance personnel, teachers as well as students all pointed to IGP development as a valuable tool for career counseling and planning and that it had facilitated increased counselor interactions with students on career and course-related issues. The IGP process provided students an opportunity to identify their interests, think about their career goals and the types of courses and programs needed to achieve those goals. It also taught ways of thinking about career planning. The IGP process helped to make it more likely that courses were related to students' interests and courses of study and encouraged students to begin planning for their post-high school careers, whether or not that involved postsecondary education.

Focus group interview quotations from seniors in the Class of 2011 relative to their IGPs included the following:

> It helped me realize the classes that I needed to take in order to graduate, but other than that, it's just kind of just been exploring for me, seeing what I like and don't like.
>
> It gives you kind of like a plan. You're not just taking random classes.
>
> You get to see the other people in the different career clusters, the other stuff that they do, to see if it interests you. But then sometimes you look and know that's not what I want to do.

> Without the IGP, I would have no idea what I wanted to do. I would be taking classes for no reason.

One 2011 senior reported that she thought that having an IGP showed her that the school really cared about her and her future:

> At first, when I got to high school, I was like they just want to get you to graduate. They don't care anything about your future, and all kind of stuff. But when they started doing this, I'm like, yes they do, because they're asking me what I want to be when I graduate, what I plan to do, and how I plan to get there, and they're giving me classes to help me get there and prepare myself, so they do care.

Counselors reported seeing a steady growth in students' knowledge of career pathways and majors over the period as a result of these efforts. They also reported that, due to the IGP process, more efforts had been made to engage and inform parents in their children's careers and educational planning, producing a steady increase in parental engagement over the study period.

One counselor stated it this way:

> We share with them what their options are if they want to go directly into the workforce, if they want to go and get a technical degree or 2-year degree or 4-year degree. And, we make sure they understand what the requirements are on admissions in higher [education] so they could be accepted into those programs.

Although the process was seen as beneficial by counselors and students, it was also reported by counselors to be very time intensive. Because of the demands of IGP-related tasks and the fact that they were still assigned a variety of other policy-mandated duties as well as still being assigned "inappropriate duties," the IGP process often resulted in work reported overloads for counselors.

11. School administration and staff buy-in was a key factor related to successful policy and POS implementation.

There was substantial variance in initial school response to the EEDA career pathways model. Some schools immediately embraced the career pathways model introduced by the state policy. Other schools seemed overwhelmed by the policy demands, whereas others appeared to be waiting (and hoping) for the "trend to pass." In the lowest performing school in our sample (based on the state's NCLB school rating), also a high poverty school, the principal, guidance personnel and many teachers spoke of this policy as a means of helping their students improve not only academically, but also to be less likely to dropout and more likely to succeed after graduation. This school was one of only two schools where the study team identified study-defined Perkins IV POS. There was also buy-in on the EEDA model at the other school where the study team identified Perkins IV POS, where school administrators spoke of EEDA as the "vision" for their school.

Not all schools, however, shared a positive opinion of the policy. Staff interviewed at a number of the schools talked about being overwhelmed by all of the requirements. “We are too busy to do everything” and “there are so many things required that it’s hard to implement them all” were refrains repeated in several schools, whether we were talking to guidance counselors, teachers, or administrators. One group told us that their focus was to “strive to survive one day at a time.” This was particularly apparent at one of the large, more college-focused schools. Staff at this school was not convinced of the need for this policy, doubted that career majors and POS were relevant for all subject areas in the curriculum, and questioned the value of the IGP process for four-year college bound students. Many teachers and staff at this school perceived these policy elements as mostly geared toward CTE and non-college bound students. This school scored among the lowest levels of both EEDA policy and POS implementation.

12. Quality, long-term partnerships and collaboration were keys to policy and POS implementation.

Partnerships appeared to be necessary to the development of POS but the key was the nature and strength of the partnership. The level of policy implementation was often higher at sample schools that were located in communities with diverse local businesses that were willing to partner with the school and provide a variety of resources, such as guest speakers, internships, and other work-based learning experiences for students than at schools without access to these partners. Schools with established advisory groups and partnerships with local businesses strengthened secondary and postsecondary alignment of POS coursework. In other contexts, communities lacked local businesses to provide mentoring, internships, and work-based learning opportunities. For one sample school in a remote rural location, the best jobs and opportunities for job shadowing or internships were over 20 miles from the school. Although there was access to a career center, it was difficult for this school to garner sufficient resources and partnership options to develop a significant number of POS for students.

Strong relationships between high school career centers and local community colleges were also critical to POS development. These partnerships were instrumental in creating strong course alignment and smooth pathways into postsecondary training and education. This was particularly the case when the local community college partner valued the links between the high school and college programs and coursework and participated in developing the high school curriculum and programs. It was important also for all parties to be involved in recruiting students. The two schools where study-defined Perkins IV POS were found had close ties to either a career center or a two-year technical/community college. At one of the schools, the POS courses were all taught at the partner career center, which in turn had a close relationship with a local two-year college. The other school had a close relationship with a two-year college that was located close to the high school, and faculty from the college taught courses for the POS at both the high school and the college. Without these partnerships, it is doubtful whether these POS would have been as fully developed.

Implications of Findings

Findings from our analyses and emergent themes suggest a number of implications for further research, for practitioners as well as for policymakers. These implications are described below.

Further Research

- Conduct similar research in other states with similar comprehensive pathways reform policies, such as in Georgia, to compare results and trends.

- Follow students for two to four years after graduation or after dropping out, to assess the long-term influence of POS on postgraduation outcomes.

- Examine student data via a high risk assessment mechanism to measure the influence of POS on keeping students in school.

- Examine student data with more precise CTE program participant, concentrator, and completer status identified, to make connections between specific CTE programs, student levels of completion, and student outcomes.

- Explore the extent to which certain groups of students benefit more than others from these types of policies. We saw our high poverty schools focus on specific types of POS to help their students succeed as soon as possible after graduation. Did that result in better outcomes for those students? As compared to students from other schools? In addition, do students in certain types of POS have better outcomes?

- For any future research efforts, collect both quantitative and qualitative data to give a more comprehensive picture of implementation and influence of POS, as was done in this study.

- Research how work-based learning activities influence program completion, satisfaction, achievement, and postsecondary transition.

- Conduct further research on necessary professional development needed for counselors, teachers and administrators to be able to implement such a complex policy. Consider the High Schools That Work model that combines continuous professional development, data collection and review, and yearly advisement.

- Examine how effectively schools can implement POS with varying levels of financial support.

- Explore what specific institutional arrangements facilitate strong partnerships and what dimensions of those partnerships are associated with seamless secondary-postsecondary course alignment.

- Examine the extent to which a focus on POS can maintain NCLB's goals of providing students with increasing rigorous curricula and preparation for postsecondary education.

Practitioners

- Conduct standardized professional development on all aspects of the policy for all school personnel involved in overseeing and implementing the policy prior to and throughout policy implementation when implementing a complex reform like EEDA.

- Emphasize the importance of work-based learning activities for students' exposure to varied work environments and careers and making contacts for future jobs. Assign a coordinator to identify these opportunities for students.

- Encourage teachers to use real-world examples and relate subject content to real world jobs and experiences. Doing this well requires shared planning time for academic and CTE faculty members. The NRCCTE has an experimentally tested model for guiding such activities.

- Implement an Individual Graduation Plan process and use the process to teach students planning skills and how to develop goals for their future.

- Establish a comprehensive guidance component to successfully implement quality career-focused POS. For most schools, this will require a re-allocation of resources.

- When developing POS across the curriculum, integrate CTE programs with other majors and programs into one shared system, use common names and CIP Code numbers, clearly outline the courses needed for the major/POS, make sure that courses appear in the registration catalog and are clearly associated with specific POS, so that students, parents and counselors have sufficient information to develop IGPs for a particularly POS.

- Encourage cross-curriculum integration through simple practices, such as common planning periods for CTE and academic teachers and allowing teachers to teach in close proximity to one another (i.e., in a shared section of the building). Co-teaching and joint projects help both CTE and subject teachers with skill development and relevance of course material. Such arrangements would allow for more formal cross-curricular planning to occur, as well as promote synchronicities that would not happen otherwise.

- View the IGP process as a viable way to facilitate discussions among staff related to POS and career majors. To increase integration, academic teachers and school counselors guiding students in the development of their course schedules and IGPs need to become more knowledgeable about CTE courses and programs. The IGP process can be a viable way to facilitate these discussions and increase school staff's knowledge of CTE.

- View the IGP process and career majors as a way to help students explore potential careers. Give students the opportunity to explore various careers of interest by allowing them to "try out" different majors. This means giving students the opportunity to switch majors and take courses across majors to identify what careers might be of interest to them or at least help them to eliminate areas not of interest to them.

Policymakers

- Develop clear metrics and definitions for implementation and assessment of outcomes. The Perkins IV policy identified four core elements, and then ten supporting components for POS, but did not operationally define them. Although it is important to provide flexibility for policy implementation, policies need to be specific enough and provide common, detailed descriptions of key policy facets so that practitioners have a clear idea of what to implement and how to assess whether implementation has been successful.

- Provide adequate funding to implement and continue the policy as planned. It is important for any state that is considering implementation of such a comprehensive reform to do a careful analysis of available resources prior to attempting implementation. If adequate resources cannot be directed toward implementation throughout the period of time that the policy will be in place, then such a comprehensive policy should not be attempted. Although no one can predict economic downturns with absolute certainty, without adequate funding and support for all aspects of the policy, it is unlikely that a policy such as the EEDA can result in consistent, positive results across schools. If a guidance component that includes an IGP process will be implemented as a part of a POS model, it is essential that adequate resources be made available to hire additional staff to handle administrative and other duties so that school guidance personnel can concentrate their efforts on career-focused activities and IGP development.

- Require career guidance education for teachers and guidance counselors. EEDA requires that students in teacher education programs at state colleges and universities be trained to some degree in career guidance. This includes the training of school counselors in preparing the full range of students for career opportunities. We did not measure this part of the EEDA policy because it was occurring at the postsecondary level and we focused on policies playing out in high schools. However, we believe that this career guidance training requirement will have a ripple effect in secondary schools over time. The lack of this training by counselors and teachers was evident in our early site visits. Many teachers and counselors too were taking on the responsibilities of training themselves as they could see the need to possess skills and information in this area.

- Implement the policy in stages. Given the findings at our schools, it is important to consider implementation of such a comprehensive policy one step at a time and ensure that all of the following are a part of policy implementation:
    - Get buy-in of major stakeholders during the development of the policy and prior to implementation;
    - Focus the first year on planning for implementation and continuing to get buy-in from stakeholders;
    - Provide adequate guidelines, materials, and curricula necessary to implement the program to school staff and teachers;
    - Make sure to offer adequate, quality training in the first year for all involved, including district and school administrators, guidance personnel, teachers, and parents,

- Remembering that turnover in the administration, guidance, and teaching corps are inevitable, and that ever deeper training is invaluable, continue to support professional development over subsequent years;
- Provide ongoing training and technical assistance throughout policy implementation directly to schools to ensure fidelity to guidelines and quality implementation;
- Provide sufficient funding and resources for ALL aspects of the policy, not just some aspects, throughout the implementation period; and
- Build in annual assessment and evaluation that can provide feedback to schools about areas where implementation is going well and areas that need improvement.

- Ensure that all relevant state, district and/or local administrative levels are working cooperatively to develop, plan, and implement the policy, so that all aspects of policy implementation are coordinated and integrated. Develop a statewide coordinating council that includes all stakeholders to oversee policy development and implementation. Administrative offices that need to develop and oversee aspects of the policy also need to coordinate their efforts. For policies similar to EEDA, this would include state and district administrators in CTE, curriculum, and guidance personnel divisions at both the K-12 and higher education levels.

- Reevaluate the weighting of courses for GPA and class ranking calculations. Implementation of POS across the curriculum will require reconsideration of the types of credits CTE courses earn so that college-bound students are not penalized for taking CTE courses. Although CTE courses may require high level skills and contain advanced content/college prep level content, CTE courses are less likely to earn honors or advanced placement credit or to be dual credit courses. Schools and districts may also want to encourage both Advanced Placement courses and dual credit courses.

- Improve the quality of student-level data to better study the influence of these types of reform. This requires that districts and/or states merge databases of core academic and CTE courses and outcomes to allow tracking of students across districts and states, and across academic levels and relevant agencies, to adequately evaluate progress on POS and any impact these may have on student dropout and other outcomes. Mobility of students and lack of coordination among relevant agencies can make the participation of students in majors and POS difficult to track.

New Blueprint for Transforming Career and Technical Education

As a final note, in April of 2012 the Obama administration laid out a new blueprint to strengthen the American economy as being "built on American manufacturing, American energy, skills for American workers, and a renewal of American values" (U.S. Department of Education, 2012, p. 1). Prerequisites to the development of this new strengthened economy are quality postsecondary education and training systems that address the need to "ensure that more of our nation's young people and adults can afford, access, and complete postsecondary education and training to earn an industry certification or licensure and a postsecondary certificate or a degree" (U.S. Department of Education, 2012. p. 1) to be prepared to participate in this economy. A key to this

system is a transformation of CTE, going beyond the changes introduced by Perkins IV to a broader vision and reform of CTE. This transformation of CTE is centered on four core principles:

1. **Alignment.** Effective alignment between high-quality CTE programs and labor market needs to equip students with 21st-century skills and prepare them for in-demand occupations in high-growth industry sectors;
2. **Collaboration**. Strong collaborations among secondary and postsecondary institutions, employers, and industry partners to improve the quality of CTE programs;
3. **Accountability.** Meaningful accountability for improving academic outcomes and building technical and employability skills in CTE programs for all students, based upon common definitions and clear metrics for performance; and
4. **Innovation.** Increased emphasis on innovation supported by systemic reform of state policies and practices to support CTE implementation of effective practices at the local level. (U.S. Department of Education, 2012. p. 2)

The EEDA policy in South Carolina is highly compatible with these principles and we believe that research such as ours has contributed to some portions of the refinement of Perkins IV that this blueprint represents.

Through collaboration with local businesses and local technical colleges, through a variety of avenues, such as CTE program advisory councils and Regional Education Centers, we found that a number of programs at our eight sample schools were being developed to align with local labor force need. Input from business partners is essential if schools are to meet the skill needs of particular local companies. Many of these businesses were working with teachers to ensure that curriculum developed met industry standards. Emerging high skills and high demand occupations, whether there were local employment opportunities at present or not, were also receiving focus for program development. To improve accountability, the state has been implementing Core Standards for all CTE courses, and Common Core State Standards are being adopted for all core academic courses for all students. All of this is being attempted through systemic reform of state policies and practices.

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