

**Mature Programs of Study: A Longitudinal Analysis  
Year 2 Technical Report**

Corinne Alfeld

Academy for Educational Development

February 8, 2010

National Research Center for Career and Technical Education  
University of Louisville  
Louisville KY 40292

## **Funding Information**

Project Title: National Research Center for Career and Technical Education  
Grant Number: VO51A070003

Act under Which Funds Administered: Carl D. Perkins Career and Technical Education Act of 2006  
Source of Grant: Office of Vocational and Adult Education  
U.S. Department of Education  
Washington, D.C. 20202

Grantees: University of Louisville  
National Research Center for Career and Technical Education  
354 Education Building  
Louisville, KY 40292

Project Director: James R. Stone, III

Percent of Total Grant Financed by Federal Money: 100%

Dollar Amount of Federal Funds for Grant: \$4,500,000

Disclaimer: The work reported herein was supported under the National Research Center for Career and Technical Education, PR/Award (No. VO51A070003) as administered by the Office of Vocational and Adult Education, U.S. Department of Education.

However, the contents do not necessarily represent the positions or policies of the Office of Vocational and Adult Education or the U.S. Department of Education and you should not assume endorsement by the Federal Government.

Discrimination: Title VI of the Civil Rights Act of 1964 states: "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance." Title IX of the Education Amendment of 1972 states: "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving federal financial assistance." Therefore, the National Research Center for Career and Technical Education project, like every program or activity receiving financial assistance from the U.S. Department of Education, must be operated in compliance with these laws.

## **Mature Programs of Study: A Longitudinal Analysis - Year 2 Technical Report**

The new legislative requirements for Programs of Study (POS) have created a need for information on how best to plan and conduct these programs. A review of state plans for the implementation of Perkins IV found that states planned to draw upon their experience with similar initiatives such as Tech Prep, career pathways, and dual enrollment (Lewis & Kosine, 2008). Because the idea and model for POS in the legislation evolved from CTE reform initiatives such as Tech Prep and career pathways, as described in the NRCCTE Programs of Study Year 2 Joint Technical Report (Programs of Study Joint Technical Working Group, 2009),<sup>1</sup> we recognized that many schools may already be engaged in activities that look very much like POS in spirit, if not in name. That is, POS may have begun with another name but have now been relabeled, if not also restructured, to better fit the new Perkins definition. This study examines the processes and structures of “mature” sites that (a) have been in existence for several years and (b) have evidence of students moving from a secondary CTE program into a postsecondary CTE program in a nonduplicative sequence of courses, as mandated by Perkins IV.

This NRCCTE research project examining Perkins IV legislation on POS focuses on the identification and rich description of mature POS that can inform CTE policymakers and practitioners about how and why POS function at the local level. We seek to explore POS from the ground up rather than imposing a top-down theoretical or policy lens. This project described in this technical report examines three mature POS sites longitudinally using a combination of research methods for studying complex social structures and relationships. Here we explain the background, methods, and preliminary observations that led up to the selection of the three sites.

### ***Background***

In collaboration with other NRCCTE POS study teams, we reviewed previous research and policy regarding the elements of POS as specified in Perkins IV in addition to other relevant documents (e.g., OVAE’s POS self-assessment for states) and project materials (e.g., surveys developed by MPR and the Academy for Educational Development [AED] for the National Assessment of Career and Technical Education, or NACTE, and materials for the upcoming OVAE POS Technical Assistance Academy, which AED is planning). We also drew on NRCCTE’s recent literature review (Lewis & Kosine, 2008) on other initiatives—precursors of POS—that attempted to facilitate the transition to postsecondary education as well as the strategies highlighted in states’ plans. These various lenses have been used to develop our understanding of what POS should look like. Figure 1 shows both the components of the legislation and other potential components of POS and how they might influence student success.

---

<sup>1</sup> See [http://136.165.122.102/UserFiles/File/Tech\\_Reports/POS\\_Joint\\_Technical\\_Report\\_Jan\\_2010.pdf](http://136.165.122.102/UserFiles/File/Tech_Reports/POS_Joint_Technical_Report_Jan_2010.pdf)

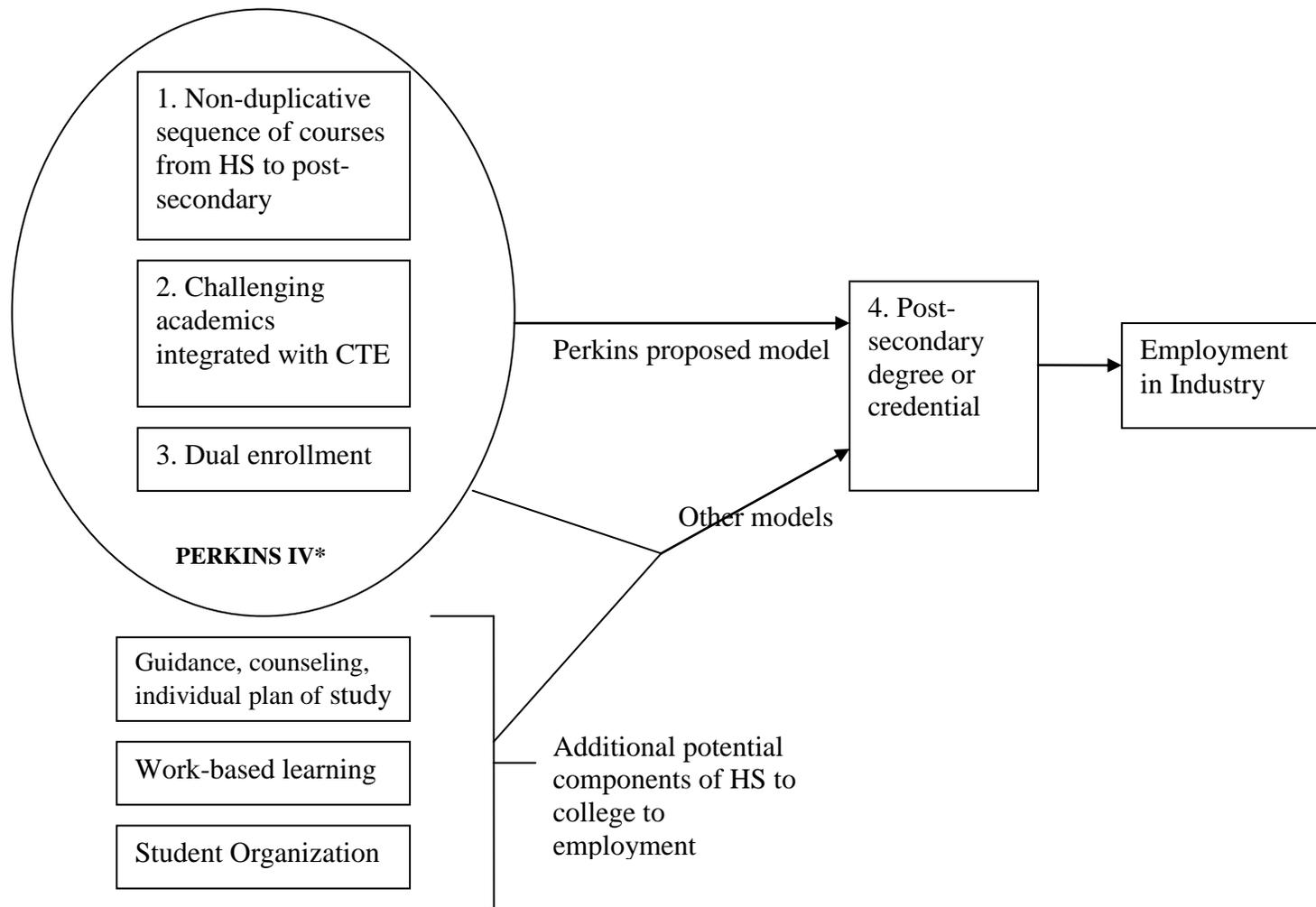


Figure 1. Conceptual framework for Programs of Study. The numbered boxes are the four required components of Programs of Study in the Perkins IV legislation.

Although POS as defined in the legislation contain four critical components that have existed in various forms in prior legislation (see numbered boxes in Figure 1), the current vision of POS makes cooperation between the secondary and postsecondary levels a critical necessity.<sup>2</sup> Thus, rather than search for sites that incorporated all four components (which would be next to impossible given that the concept of POS was only recently introduced), the primary selection criteria for mature POS sites in this study was one particular component: several years of evidence that CTE students move from a high school CTE program *into and through* a postsecondary CTE program. We assume that communication and coordination had to have taken place between secondary and postsecondary administration and faculty in order to create these successful programs. We wanted to learn about how this occurred in order to help the field better understand the critical elements and mechanisms of POS.

### ***Theoretical Framework***

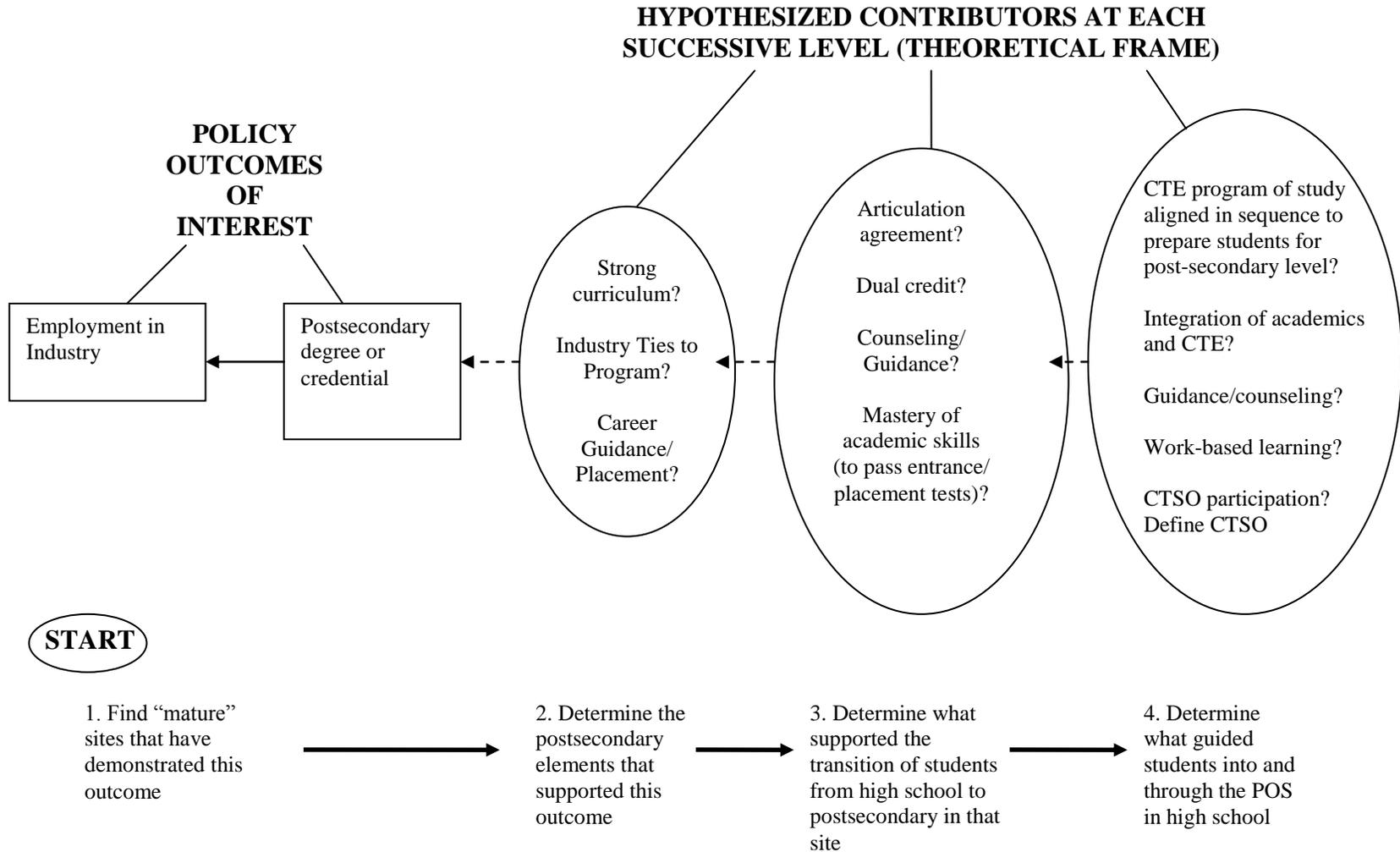
To answer research questions of “why” and “how,” we selected the case study method (Soy, 1997; Yin, 2009). According to Yin (2009), case study researchers must develop “theory, propositions, and issues underlying the anticipated study” (p. 24). The purpose of POS is to make career pathways more transparent for students—including specifying necessary coursework at the high school level leading into a college program, and then the necessary coursework at the college level needed to graduate with a degree or certificate in the CTE field. We developed the framework presented in the upper portion of Figure 2 for what we thought needed to be in place for this to happen, based on prior research and policy.

The lower portion of Figure 2 depicts our approach to analyzing the data within the context of this framework. We chose “backward mapping,” a tool used by policy analysts (Elmore, 1980; Recesso, 1999), because we seek to understand the implementation of a policy (i.e. the POS piece of Perkins IV). Much like “reverse engineering” in technical fields, backward mapping is an approach that can help unpack a social program or policy. The basic idea is that the analysis starts at the very end of the process—the outcome—and works backward to each successive level of implementation in order to understand how the outcome was achieved. This is why the approach described in the lower portion of Figure 2 appears to “start at the end” (if one is examining the figure from left to right). We are beginning with the desired outcome of POS—the smooth transition of students from secondary to postsecondary in a particular career area—and determining via case studies how each mature site got to that point. It should be noted that all sites selected for the study have had secondary-postsecondary linkages for at least 5 years.

---

<sup>2</sup> Findings from the National Assessment of Vocational Education (NAVE; U.S. Department of Education, 2004) showed that the most challenging aspect of Tech Prep was communication and alignment between sending high schools and receiving colleges; few if any Tech Prep sites accomplished this successfully.

Figure 2. "Backward mapping" Programs of Study.



Although we have hypothesized that the elements included in Figure 2 are important, we may discover other critical elements along the way. These critical elements may or may not map onto or align with the Perkins legislation; Figure 2 represents the theory we are testing in this longitudinal research study. The study will eventually produce individual backward maps for each case (mature site), as well as a general map of how POS seem to be functioning in practice. The discussion in our final study report will address how well POS in practice align with the Perkins IV elements; we will also address the pros and cons of close adherence to policy versus looser adaptations based on local needs and circumstances. This discussion may help sites still struggling with how to develop and sustain seamless links between secondary and postsecondary CTE programs; it may also inform policymakers as they craft the language for the next reauthorization of Perkins.

We came to the above decisions about the selection criteria and method of inquiry after much discussion about the purpose of this study.<sup>3</sup> We asked ourselves whether achieving all four components of the Perkins IV legislation was more important, or whether the “ends” (a smooth transition into and through postsecondary) could justify the “means” (even if they did not include all the elements in the legislation). Although this is still an ongoing question, we believe that the chosen methodology will provide the kind of evidence and analysis that is of most use to the field.

### ***Sample and Method***

This longitudinal project will eventually culminate in a set of in-depth case studies, supplemented by student data, of three different mature POS sites. To select the three sites for the research, we first had to scout out the possibilities. In the paragraphs that follow, we describe eight sites from around the country that were visited by the AED team as we searched for mature POS sites or cases to include in the longitudinal study, as well as preliminary observations from this process.

### ***Identification of Potential Mature School Sites***

***Site selection.*** In order to identify mature sites, we relied on suggestions from the National Association of State Directors of Career Technical Education Consortium (NASDCTEc), the Association for Career and Technical Education (ACTE), researchers, and others involved in POS-related CTE efforts (e.g., the League of Innovation’s College and Career Transitions Initiative, or CCTI). Initial scouting visits were made to eight recommended sites; on these visits, we (a) sought evidence that they met our criteria for mature sites and (b) established relationships with relevant individuals in order to facilitate future visits should these sites be selected for the study. The method of identifying and narrowing a pool of potential sites included nominations from CTE leaders at the national and state levels in government, for-profit, and not-for-profit sectors; preliminary web searches; phone calls; and finally an in-person visit. AED received almost 40 nominations of local sites and ended up with eight that we selected to visit. In the initial screening (web and phone), we determined whether or not the site indeed had a secondary-to-postsecondary linkage. We did find many impressive secondary or postsecondary

---

<sup>3</sup> Discussions took place between AED, NRCCTE, and OVAE prior to the start of the project.

programs, but without a strong and demonstrable link between the two that provided a clear pathway to students, we did not consider these programs to be mature POS.

The criteria used for selection into the final pool of potential sites included: (1) active cooperation between secondary and postsecondary levels, (2) sufficient numbers (> 20) of students in each POS transitioning from secondary to postsecondary each year, and (3) access to electronic student transcript data. Several sites that were highly recommended and met all of our initial criteria declined our visit on the basis of limited time and resources for hosting researchers. For this reason and because of our own limited time and resources, we do not claim to have conducted an exhaustive search. However, what we do have is a range of approaches to implementation of POS at the local level that we hope will help policymakers and practitioners better understand how POS are being implemented across the country.

*Site visits.* Eight sites met our criteria and were visited in order to further discern if they would be eligible for inclusion in the longitudinal study. Visits to each site lasted approximately two days and consisted of informal interviews with the contact person at the site as well as other staff members that the contact person felt were important to our understanding of how POS were developed. We specifically asked to meet with as many of the following as possible:

- Secondary principal and/or vice principal
- Secondary counselor(s)
- Secondary CTE instructors in the POS of interest
- District personnel, including those responsible for student records
- Postsecondary faculty in the POS of interest
- Postsecondary administrators involved in the development of POS
- Postsecondary institutional research staff or those responsible for student records
- Advisory committee member(s) from local business

All sites except one were visited by two people, who both took notes. Questions asked in the interviews encompassed the history and development of the POS (how did it start, who was involved) as well as challenges and successes along the way. Materials such as course catalogs and other printed materials pertinent to the POS and/or dual enrollment opportunities were also collected during these visits. All of this information formed the basis for the site descriptions provided below. More systematic analysis will be conducted once the notes are transcribed and coded.

Of the eight sites that were visited, half were community colleges; the other half included a district office and three technical high schools. Although the final study includes only three sites, here we offer a very brief description of all eight potential sites.<sup>4</sup> For the purposes of anonymity, we have masked the names of the sites; however, their states and overarching characteristics are summarized in Table 1.

---

<sup>4</sup> In this report, the summaries of each site are self-contained; not every aspect of every site is covered, nor are similar aspects given equal coverage across sites. For the purposes of this report, each summary should be seen as a snapshot that gives the reader a sense of context. The case studies in this project's final report will provide all relevant detail for each of the three selected sites and provide comparisons across sites.

Table 1  
*Eight Sites Visited*

<i>Site</i>	<i>State</i>	<i>Type</i>	<i>Overarching Characteristic(s)</i>
A	FL	District	Developed over 20 programs of study
B	GA	HS	Co-located on the campus of a technical college
C	SC	CC	Rural; influenced by statewide EEDA legislation
D	KY	CC	Ahead of the curve: began POS over 8 years ago
E	PA	HS	Involved in developing POS models for the state
F	NM	CC	Ethnically and socioeconomically diverse urban area
G	MA	HS	Technical high school with integrated academics
H	MN	CC	Part of an existing Tech Prep consortium

*Note.* CC = community college; HS = high school.

**Site A** is a district in a relatively high socioeconomic area in which the district office employs a CTE staff of nine, including a director of CTE, six CTE curriculum coordinators, and two administrative support staff. This office has developed over 20 POS across the district, many of which have connections with local industry. There are three options for each CTE POS, depending on whether a student plans to go directly into the workforce, to the local community college, or to a four-year institution. In addition, there are a variety of POS models, including a combination of academic and CTE courses; career academies (where there are cohort teams of teachers and students and lessons and projects are planned in teams); and dual enrollment. If a CTE program is not offered at their high school, students have the option of taking the courses at another high school. This district has the highest number of dual-enrolled students in the state for their size, and 90% of their students go directly into postsecondary education. Most go on to four-year colleges, though some take advantage of dual enrollment options by attending the local community college first and then transferring to a four-year institution.

**Site B** is a technical high school based on a model used in business and industry and located on the campus of a technical college. It is an local education agency-supported charter school (as opposed to an independent charter school), meaning it functions as part of the school system but can maintain flexibility and avoid regulatory barriers. High school students from comprehensive high schools in the county can attend this technical high school for all or part of the school day. Academics are offered for those who attend full-time. While at the school, students are called *team members* (teachers are called *directors* and the building leader is called the *CEO*) to simulate the responsibility and teamwork that is necessary in a work environment. The programs are all linked with local and regional industry. Fifteen of the CTE programs offered are eligible for a technical certificate of credit (TCC) from the college, which students receive along with their high school diplomas at graduation.

**Site C** is a community college in a sprawling, rural, mostly disadvantaged (minority and low-income) region encompassing two counties in South Carolina, a state that is currently implementing new legislation (the Education and Economic Development Act, or EEDA) aimed at comprehensive school reform with higher standards and postsecondary opportunities for all students. The college has a very good relationship with its districts and with the regional education consortium, as well as with members of an education and business alliance that discusses local labor needs and plans strategies for meeting them. The limited resources and

small-town nature of the area mean that it is easy to form personal relationships that facilitate efficiency and collaboration. In the last several years, all of the programs at two county career centers have become articulated with the college. The college has also been designing and implementing a web-based data tracking system for the secondary and postsecondary levels across their region.

**Site D** is a community/technical college located in an industrial town with fairly close ties among education, business, and government. The college is fed by 14 high schools (including two vocational centers) in six counties. The college has the highest enrollment of high school students in the state, with 1,700 high school students dually enrolled (30% of the total college enrollment). The college began developing dual enrollment options over eight years ago to provide needed skills to the younger generation in a town with an aging population. The curricula are set in collaboration with the local workforce investment board, and agreements between the college and area high schools are individually tailored by a dedicated coordinator to the needs of each high school (including providing distance learning when necessary for rural schools). The college has tried to make it easy for each of its feeder high schools to set up articulation agreements to fulfill their vision that every student should be able to graduate from high school with some college credit.

**Site E** is a regional technical center on the outskirts of an industrial town that mainly serves outlying rural areas. The technical college located across the street has designed a two-year associate's degree in technical studies especially for students enrolling after graduating from the technical center. The tech center students mostly come on a part-time basis from one of nine home high schools for their CTE classes, but they also can choose to come for the full day. The curriculum is designed to teach students what they need to be able to do on the job and is structured so that students learn at their skill level, rather than by age or grade. The majority of programs offered at the school have academic-technical curriculum crosswalks created in a series of teacher workshops. Staff from the school participated on several statewide POS committees and used some of these crosswalks in developing state templates. Many programs have articulation agreements with the college already in place as a result of Tech Prep. Each CTE program has an advisory committee of 15 people consisting of instructors from the high school and the college, alumni, and members of the business community.

**Site F** is a community college that plays a central role in postsecondary education for an urban population that is heavily Hispanic and lower-income. The college population includes many first-generation college students who need help navigating college culture. To assist these students, each department (e.g., engineering or education) at the college has its own "achievement coach" who works with students on everything from financial aid to personal problems in order to promote retention. The college also has an office whose sole function is to work with area high schools on recruitment, articulation, credits, and enrollment. The college has articulation agreements in CTE areas with four feeder districts. Every program at the college is required to have an advisory board including secondary, postsecondary, and business/industry representatives. CTE programs are highly attuned to the needs of both students and employers in the region; some students are even recruited to work before they have finished their programs. Due to the college's outreach to high schools, dual enrollment has more than doubled in the last few years.

**Site G** is one of 26 regional technical high schools and serves 13 towns nestled geographically between three urban areas. Students have the option to attend the career-oriented school full-time instead of their local comprehensive high school. A competitive application process for entry takes into consideration scholastic achievement (GPA), previous attendance, disciplinary records, guidance counselor's recommendation, and an interview. Entering students are guided and supported through a career exploration process with their teachers, counselors, and parents leading to a decision midway through freshman year on a "shop" (career area). For their remaining time in high school, students rotate one week in academic classes and one week in their shops. CTE and academic teachers work together during common planning periods to create complementary curricula. Most of the CTE teachers have experience in and ties with local business and industry, which provides equipment, curriculum advising, and internships or co-ops for students. For students, personal reflection on career interests and employability skills are emphasized; a cumulative electronic portfolio of academic and technical skills, including examples of their work, is required of all students, and along with their high school diploma, all students receive a certificate of occupational proficiency.

**Site H** is a technical college in a small city that is the linchpin of a regional Tech Prep consortium that includes 27 school districts. It is also co-located with the local workforce center. The college's articulation/dual enrollment programs started six years ago in response to high schools' need for expanded CTE programs that they could not afford alone. Area high school CTE teachers were retiring, and the schools approached the college to talk about how to work together and share resources to offer relevant programs to students. They brought in people from area colleges, high schools, businesses, and workforce development to talk about ideas and what was going on elsewhere. Funding came from a state grant as well as local industry. The leadership/implementation team meets regularly, as do consortium-wide curriculum groups with high school and college faculty in each program. College faculty are regularly out in the high schools (many of the college-level classes are taught by college faculty at the high schools), and high school students are also brought to campus to become familiar with the college environment. The college is in the process of completing an electronic website for POS to show what is offered at each high school and how it connects with the college.

### ***Selection of Sites for Final Sample***

Of the eight sites visited, four met all of our criteria both on paper and in person. The other four were disqualified because information gathered during our visit suggested that the site was not a true POS in the way that was envisioned by our research team, NRCCTE, and OVAE. For example, Site A had many POS but seemed to be tracking their students according to postsecondary plans; we did not think that tracking was part of the spirit of POS. Site E had agreements with the technical college across the street, but when we spoke with the college staff, they were unaware of which students from the high school were in the POS or had earned college credit while in high school. In other words, the secondary-postsecondary linkage seemed weak and communication poor. Other sites were simply logistically impossible to study. For example, Site G had many articulation agreements with colleges all over the region, but none in particular that could be studied intensely as a true POS. Sites C, D, F, and H met our criteria and seemed like viable places in which to conduct our longitudinal study. Unfortunately,

representatives for Site C were unresponsive after the initial visit. The three remaining sites were chosen for the remainder of the study period.

Our final selections vary geographically and in the occupational areas of the POS selected for study (see Table 2 below). The particular POS that are most mature at each site reflect the labor market needs of the particular region. The three selected sites all agreed to participate in the study and have been working with us to facilitate data collection.

Table 2  
*Selected Mature Programs of Study Sites*

<i>Masked Site Name**</i>	<i>Location</i>	<i>Programs of Study*</i>
River College	South	Industrial maintenance, mechatronics
Desert College	Southwest	Film Tech, Culinary Arts, Construction technology
Northern College	Upper Midwest	Automotive technology, welding

*Note.* \* We did not select any POS in the health occupations, as many of these are further along in their development and have different requirements (e.g., state licensure) than do other occupational fields. \*\* All site names are pseudonyms.

### ***Data Collection at Selected Sites***

***Student cohorts.*** Two cohorts of CTE students from each high school in the selected sites will be tracked for a period of 3 years on their secondary and postsecondary experience, academic and technical achievements, and initial work-related experiences. The time frame includes the last 1-2 years of high school and the first 1-2 years of postsecondary education and/or work, depending on the cohort. In the first data collection in the spring of 2009, Cohort 1 consisted of high school juniors (to be followed through their first year of college). Cohort 2 is made up of high school seniors (to be followed through two years of college). Because the second data collection will take place at the college in the fall of 2009, those students from Cohort 2 in the high school portion of the study who have enrolled at the college will be surveyed again as entering community college students. All students who began participating in the study in high school and who enroll at the participating community college (POS are usually articulated with community or technical colleges, not universities) will continue to be tracked while they are enrolled and after college graduation; attempts will also be made to follow students if they discontinue their education at any point during the course of the study. More details on the composition of the student cohorts are available in the Technical Appendix .

Because we are also collecting transcript and survey data for college students in the POS of interest who may not have participated in an articulated high school POS, these students will be added to the sample and will serve as a natural control group (i.e., they did not receive the high school portion of the POS treatment – see the Technical Appendix, Figure 1). To the extent possible, we will select a comparison group matched to the treatment group on background characteristics. We will also collect information about their sending high schools. Using appropriate controls such as prior achievement (grades and test scores) and demographics (age, gender, race/ethnicity, SES if available), we will conduct mean comparisons between groups on outcome variables (e.g., grades, test scores, earning a degree/certificate, and obtaining

employment in the field) and construct separate longitudinal models to compare groups over time. We will be able to determine whether those students who entered the program from an affiliated high school POS exhibit better outcomes than those who did not.

**Data sources.** Quantitative data sources include student surveys (developed in cooperation with the other two NRCCTE POS studies) and secondary and postsecondary student transcripts. At the high school level, course taking, attendance, GPA, and graduation information will be collected and analyzed. College transcripts with information on attendance, courses taken (including developmental/remedial), grades, and diploma, degree, and/or credential earned will be analyzed. Where possible, we will also collect standardized achievement test and placement test scores. In addition, in cases where technical skills tests have been given in the POS, we will make an effort to obtain these scores as well. For students who did not matriculate at the affiliated community college in each site, we will collect employment and education status and reasons for decisions through a follow-up survey; all students surveyed in high school were asked to supply an email address and home address for this purpose.

Qualitative data sources include focus groups with students and interviews with academic and CTE teachers, school principals, guidance counselors, CTE district- or school-level directors (if applicable), and postsecondary-level staff and instructors. We will also collect and review documents such as state plans and district- and school-level information related to programs of study. We will be especially interested in the relationship between what the site states on paper that it does and what it is actually doing (e.g., with articulation agreements).

The implementation of POS at each site will be documented through case studies built from both quantitative and qualitative data. To illustrate, through interviews and focus groups, we will determine the key players involved in decision making and implementation, the policies and procedures adopted, and the ways in which career pathway options across POS are made available to students. Student perspectives on their experiences and career plan activities/services available to them will be collected from surveys and focus groups. Transcripts will reveal whether students are indeed taking a nonduplicative sequence of courses leading to a postsecondary degree or credential, and both survey and transcript data on transition outcomes for the POS and comparison students will show whether or not these practices and structures did what they were meant to do.

### ***Data Collection Plan***

Data collection began with 3-day site visits to the high schools in the selected POS sites in April and May of 2009. Transcript data were collected electronically in the summer of 2009. A similar procedure occurred at community colleges in September 2009 (visits are separated in time to reduce the burden on our contacts in each site who facilitate our visits). Data collection will continue in this manner each year for the next three years. Findings based on the first site visits help to shape interview and focus group questions for subsequent site visits. Similarly, transcript data will be examined and questions or issues resolved this year in order to facilitate future data collection efforts.

**Qualitative data.** During the first data collection site visit, we interviewed key stakeholders such as administrators, counselors, teachers, and business/industry partners. The structured interviews were supplemented with observation and information gathering at the site (including the surrounding community). Interview questions addressed issues about the *structure* of the POS, including:

- course sequencing at both the secondary and postsecondary level, as well as articulation between the two;
- dual credit and dual enrollment opportunities;
- distance learning opportunities;
- the integration of academics into the CTE POS (both within and across courses);
- availability and structure of career guidance, including individual graduation plans; and
- opportunities for work-based learning (WBL).

We also asked the following questions about the *development* of the POS:

- when did the POS begin?
- who initiated the process? (Business? Someone at the school? Legislation?)
- who was involved/ at the table for the planning?
- how long did it take?
- what were the barriers and challenges?
- what facilitated it?
- what would you do differently if you were to do this again?
- what are your plans for ongoing improvement?

We asked these questions of multiple individuals (e.g., teachers, administrators, counselors) and extensive notes were written up from this first site visit as a basis for the case study report. We are currently looking for themes across interviews in addition to areas where there is disagreement (we will include probes about these areas in subsequent site visits).

Typed notes from interviews and observations, as well as electronic documents are being coded by the research team using the NVIVO qualitative analysis software package. Various elements of POS such as curriculum integration, articulation, and guidance counseling are being coded either for their presence or absence (0-1) or along a continuum determined in collaboration with NRCCTE and OVAE so that we may enter these variables into our statistical models over the next three years.

Our qualitative data will help us begin to backward map the elements and processes of the POS. Subsequent interviews with the original POS stakeholders (from high schools, college, and local business) and focus groups with students will allow us to probe further to enhance our understanding of the POS. Case study reports and a backward map (akin to a logic model) of how the POS works will be created for each site. New information and perspectives, as well as outcomes, will be added after each twice-yearly site visit in Years 3-5 in order to clarify the picture and bring into focus what are the key drivers of POS implementation success. The final report will discuss similarities and differences between the sites in structure, processes, drivers, and challenges but will use caution when making generalizations about how POS work in general based on these three cases.

**Quantitative data.** Student surveys were developed and piloted in collaboration with the other NRCCTE POS study teams. The spring surveys were administered on site by AED staff, and all subsequent surveys (to college and non-college participants) will be administered online. The surveys ask about students' activities, attitudes about their experiences, and career and educational goals (immediate and future). On the detachable (for anonymity) front page of the paper survey administered on-site in spring 2009, students were asked to provide us with future contact information; once the students leave school (either immediately following high school or after postsecondary education), we can use their contact information to find them again. As mentioned earlier, students who drop out of school or do not continue to the college will also be contacted for follow-up so that comparisons can be made between those who did and did not continue. In follow-up surveys administered annually, students will be asked about their educational and occupational experiences since the time of the last survey, reasons for deviations from expectations, immediate and long-term goals, and name of their employer if they are working. Students who were added to the sample at the college level will be asked retrospective questions about their high school career-planning experiences. Identification numbers have been assigned to each student to protect confidentiality and anonymity and will be used to match survey and transcript data each year and across years.

Transcripts will be collected following the end of each academic year from the institutions in which the students in each of the cohorts are enrolled (high schools for the first two years and from community colleges for four years: 2009-2012). From the high school transcripts, we will learn the students' attendance, GPA, standardized test scores (if available), and graduation status. Community college transcripts will provide data on courses taken (including remedial or developmental and dual credit), GPA, and graduation year and degree/certificate. Where possible, we will also acquire students' scores on industry-recognized tests (e.g., ASE) and college placement scores (e.g., Accuplacer). We will use a common template and electronic data transfer across sites, in addition to keeping participating students anonymous by using ID numbers only.

Because this is a bottom-up descriptive research project, we do not wish to prematurely suggest a statistical analysis or design. However, the initial statistical model is likely to mirror the theoretical model depicted in Figure 1 (including relevant elements not specifically mentioned in the Perkins IV definition of POS). From there, we will need to adjust the model to find the best fit of the model to the data. It is clear that we will use multivariate modeling techniques with achievement and transition (college graduation/employment) indicators as outcomes. Structural equation modeling is an option depending on the quality of data, the sample size, and whether we decide that constructing latent variables is warranted. Regardless of the analytical approach, it will be very interesting to compare the final statistical model for each site to the backward map for the site we developed with the qualitative case study data. We will consider the students in the college POS who did not attend an articulated POS in high school as a quasi-comparison group for those students who attended the affiliated (articulated) high school programs, as described above. However, we make no claims that this approach is experimental, nor are quantitative comparisons the focus of this project.

Quantitative data will be analyzed annually and cumulatively using appropriate statistical methods. Concurrently, we have begun to build our descriptive case studies and initial systems

models of how POS sites work. At the end of the project in 2012, we will complete our analyses and produce a final, comprehensive report of our findings.

## Summary

Several issues emerged from our visits to these eight initial sites that we believe are important in thinking about how POS work at the local level as well as what areas are still in need of refinement. We hope that these initial observations will provide topics for further discussion in the field. These are organized loosely by the four legislated components and several additional subcomponents of POS.

### Components of Perkins IV

#### 1) Secondary and Postsecondary Education Elements

**Direction of Initiative.** Most of the sites we visited told us that *the college was the first to reach out to the high schools* to begin building common curriculum sequencing and articulation agreements. This may have been because most of the sites we visited were colleges (as opposed to high schools); however, in the three non-college sites we visited, there appeared to either be a relatively weak connection or no connection with a local community or technical college. These high schools seemed to be constructing their own POS in somewhat of a vacuum, though all of them identified potential postsecondary and career options and were knowledgeable about their state's efforts with regards to POS. These high schools may need guidance or resources to establish the postsecondary links. In some cases, it seemed the high schools were reluctant to jump through all of the hoops that the college required, in terms of scheduling, costs, and teacher credentialing in order to offer courses for college credit to high school students (see *Logistics*, below).<sup>5</sup> It is our belief that the secondary-postsecondary linkage, including development of articulation agreements and non-duplicative curriculum sequencing, could be made stronger in these sites if a local college reached out more overtly, as was the case in five of the sites.

**Relationships.** It seemed from our visits to the 8 sites that those in *smaller or more rural areas had much better relationships* across agencies, offices, and institutions than those in larger or more urban areas. More importantly, it appeared that these close ties, in which everyone in the community knew one another and wore multiple hats, help facilitate progress in developing and maintaining the POS. In the larger sites, the quality of the relationships was less personal and more bureaucratic; the multiple layers and lack of frequent, direct communication was often a barrier to getting things done, despite the greater availability of resources. In fact, the necessity of having to do things with limited resources actually seemed to bring the smaller communities together in a spirit of cooperation and efficiency that facilitated the development of POS.

#### 2) Coherent, Non-Duplicative Alignment of Rigorous Academic and Technical Content

---

<sup>5</sup> The definition of POS includes both secondary and postsecondary elements, so these levels *must* be working together. Needless to say, the sites that were nominated but did not appear to have a strong linkage were not selected for the longitudinal study.

**Curriculum Integration.** We did not find much alignment between CTE courses and academic courses, and curriculum integration within either type of course was even rarer in most of the sites we visited. Two of the technical high schools had made efforts to offer complementary academics with their CTE courses. In the rest of the sites, although many of the POS on paper listed academic courses, it was not clear that rigorous or even relevant academics were actually being taught to CTE students in the POS. Rather, academic courses were a parallel but separate sequence. This situation is understandable because it is very difficult to align academic course content (e.g., English) with more than one industry or career area (e.g., culinary, welding, health) at a time, and many academic teachers had students from multiple POS in their classes. It was easier for the CTE teachers to include academic content in their courses, and although we saw some of this, it was not happening in a systematic way (i.e., with curriculum mapping).

**Danger of Tracking.** The spirit of POS in the legislation is for *all students to have a clear path to college and a career*. Multiple POS tailored to students destinations after high school (e.g., work, 2-year college, or 4-year college) could be perceived as tracking. It appeared that some school staff might be under the assumption that many or most of their students will be going directly to work after high school, if this has been the tradition in the community. In at least one of the sites we visited, it was not clear that the high school felt the need to offer higher level courses or put articulation agreements in place. On the other hand, some larger districts may think that—with large numbers of program areas and large numbers of students—it is a good idea to organize POS sequences by the students’ post-high school plans. For example, one site put a lot of time and effort to developing over 20 POS. In fact, they actually developed 60 POS because, in essence, they created 3 tracks for each one: For each area, they had a POS for students planning to go to work directly after high school, a POS for students planning to go to a 2-year college, and a POS for students planning to go to a 4-year college. This likely made it easier to handle large numbers of students moving through the system, and probably made the career relevance of school more clear to those who might otherwise have not seen the connection. The purpose of POS, however, is to get all students into and through college, not to preserve a traditional tracking system where some are not prepared to enter college when they graduate from high school.

**POS on Paper.** There has been a rush to put POS on paper. Many states are requiring locals to develop POS and are providing guidance to local agencies in the form of POS templates. However, *there seems to be a disconnect between how many POS models (on paper) have been developed and how many POS (in practice) are actually up and running*. We believe this is because the “paper POS” is something that is relatively easy to do to meet an accountability requirement – that is, it is a top-down approach – whereas “practice POS” need to be developed through a lengthy, complicated local process of building partnerships, making decisions, and negotiating compromises (about issues such as those mentioned above); in other words, a bottom-up approach. Sometimes, the two are developed in tandem, but often they are not.

To illustrate, the model developed by the League of Innovation for the College and Career Transitions Initiative (CCTI) funded a few years ago by OVAE, or some adaptation of it, is the most ubiquitous form of paper POS. This document depicts on paper what is offered in the POS and how it fits into a course sequence. This is often what the LEA shows to the approving body (usually at the state level) and what passes for a POS, but it does not mean that either horizontal

(academic/CTE) or vertical (secondary/postsecondary) integration has actually taken place, just that it has been arranged on paper.

More specifically, the CCTI model is basically a grid (on a landscaped 8.5" x 11" piece of paper) for each POS, with columns for each grade level and rows for each course. It lays out what courses are recommended for the student to take all four years of high school. The grid might have the name of the POS and the associated career cluster at the top of the page, and the local college and university programs and possible careers available at the bottom. The majority of the page, however, is taken up by the grid in which the CTE courses for the POS are listed across a row labeled *electives* and relevant, required courses for the particular grade level are listed across the rows for math, science, language arts, and social studies.

In other words, the academic courses shown for the POS sequence are not necessarily aligned or integrated with the CTE courses. However, such POS on paper are often approved. A better alternative would be for POS to be documented on paper during or after the POS is actually hammered out between all involved parties rather than before. Documentation of newly-created aligned curriculum, teacher credentials for dual credit courses, articulation agreements, course and bus schedules should be required to be submitted with the POS document for state approval. If paper precedes practice, there is a risk that the process will cease before the real work has started.

### **3) Opportunity for Dual or Concurrent Enrollment**

***Logistics of Dual Credit.*** In creating connections between secondary and postsecondary institutions, there are many logistics that need to be taken into account.

*Location.* Where the college level course is taught to high school students varied across the sites that offered them. If the dual credit course is offered at the college, both semester and daily *schedules need to be aligned* between the institutions and *transportation provided*. At both of the technical high schools we visited that are co-located with a technical college, the courses offered to high school students for college credit are, not surprisingly, taught at the colleges since they are so close. The other technical high school was located within the vicinity of many different colleges but none with which it had a unique relationship. The courses available for college credit at this school are taught at the high school and articulated with a variety of area colleges. Dual credit or articulated courses offered at the high school versus the college were about evenly distributed in the other sites we visited (the school district and the community colleges). In the sites where the dual credit course was offered on the college campus, the school districts or the college needed to provide transportation, or else the students drove themselves to campus. Scheduling was a major issue that these sites had to work through to allow for students to leave their high schools for part of the day without missing any of their other classes. Colleges were often trying to develop arrangements with multiple high schools that are all on different schedules. Many creative and individualized solutions had been worked out at the sites that were successful at dual enrollment, but this often came at a high cost to the college.

*Teacher credentials.* If the dual credit course is offered at the high school, either the college instructor needs to travel to one or more high schools to teach the course, or the high

school *teacher needs to have the proper credentials*, either by showing relevant documents or by enrolling in college courses themselves to receive a degree. Because many high school CTE teachers have industry experience in lieu of a bachelor's degree, this was sometimes a hurdle. In addition, compensation arose as a contentious issue in several cases: 1) when the college instructor had to go out to the high schools as part of their work day, and 2) when the high school teachers were not paid extra by the college for the extra work involved in teaching a college level course.

*Transcripts.* Many high school *students lose their college credits unless the college records them* at the time the course is taken. It was rare for us to encounter a seamless procedure for students to receive credit for their articulated courses once they enrolled in the college. In two sites, high school students were required to enroll as a college student in order to take the dual credit courses, so they were considered college students at the same time as they were high school students. This way, their course credit went directly onto their college transcript and appeared when they enrolled full-time at the college. However, in most cases, the college did not have a system of recording which high school students had passed the course and were eligible for the credit. This was true even in sites where the program faculty at both levels had very good working relationships. It seemed to be an issue that instructors expected that the registrar or other college administrative office would handle and was therefore beyond the control of individual programs. However, the colleges claimed that their data systems were not set up to flag incoming students who were eligible for credit. In a few sites, it was incumbent upon the students to obtain, keep, and present a piece of paper from their high school to the college in order to claim the credit. Not surprisingly, many students failed to do this and ended up re-taking the same course at the college at full price. Due to budget cutbacks at one site, one of the dual credit sequences was halved so that high school students only received half the credits needed to count for a college course; therefore, they needed to retake the course at the college level. The sites varied in whether or not the college credits earned could be transferred to another college in the state; clearly, the credits are more valuable when this is the case.

*Cost and Benefit.* The question of *who would pay the tuition* for dual-enrolled students was a barrier that some of the sites had worked out and others were still wrestling with. In most sites the college covered the cost of the tuition and received more state funding for their increased enrollments; the school or the students paid for their books. In one site, the principal told us that the state could not decide how to pay for dual credit, which was why they did not offer it. The school did have articulation agreements with a few colleges for a handful of its courses; the colleges had agreed that students who passed certain courses could place out of the first year in their college program – much like Advanced Placement. However, dual enrollment/dual credit was not being actively pursued in that state. Even when tremendous efforts had been made and the opportunity was clearly there, *students did not always benefit*. This was either because of logistical issues in the secondary-postsecondary arrangement (such as when a college had no way of knowing which students had taken the course in high school and were eligible for credit, and/or the students did not remember to claim their credits once they enrolled in the college) or because of the students' own choices. That is, some students didn't want to miss classes or activities at their high school (in the sites where the college course was offered only on the college campus) or preferred to "make an easy A" by not taking the more rigorous college-level course. Although many of the students in our focus groups told us they were taking a dual credit

course because it was “free college,” or “more fun than high school,” only half or fewer of eligible CTE students in the sites we visited took available courses for college credit while in high school. We believe that as POS are better developed and refined, the number of dual enrollments will increase.

#### **4) Leads to an Industry-Recognized Credential, Certificate, or Degree**

**Advisory Committees.** In the sites where POS were working well, there were *active advisory committees* consisting of secondary and postsecondary instructors and business representatives. Some sites also included alumni of the POS who were now working in the local community. The committees met at least once per year, but often two to three times, to discuss issues such as curriculum content, equipment, changes in industry standards, and local internship and co-op arrangements. Some advisory committees also regularly discussed regional industry needs and employment outlooks. To facilitate the meetings, which seemed to occur in the evening, either the high school or the college offered space and refreshments. In one technical high school, students in the culinary program prepared and served dinner for the different advisory committee meetings. Advisory committee members were clearly committed to the improvement of the POS, otherwise these meetings would not succeed or be productive. Again, this seemed to happen more easily in the smaller communities.

### **Supporting Components**

#### **5) Career Guidance**

**Most sites did not provide regular guidance to students about POS in high school.** In only one technical high school we visited did we find that POS-focused career guidance was emphasized (Site G). In fact, the entire school was structured around students’ career exploration and development, which meant that the guidance and curriculum included related planning activities, particularly in the freshman year. These included interest/aptitude tests, a rotation of 2 weeks in each of 7 career areas, and course-planning meetings with parents culminating in an official “decide activity” in which the student would select a career area and map out a course plan and goals for the next four years. Career guidance for students was much less well-developed in the other sites.<sup>6</sup> In some high schools, career exploration websites (such as ACT’s Explore test) or other online tools were offered but not required. When we spoke with guidance counselors, the majority were more focused on testing, scheduling, and college applications than on helping CTE students choose a POS. Some counselors were not even familiar with the term *program of study* and were unaware of and/or not involved in the course sequencing work that had been done between CTE teachers at the high school and the local college. That is, CTE was barely on the radar for many guidance counselors at the high schools we visited.

#### **6) State Leadership**

It should be noted that in some of the mature sites we visited, the staff had been involved in state POS planning committees. In some cases, it was because of the advanced state of progress on

---

<sup>6</sup> At Site C, where the state is mandating career guidance around POS for all students, there was beginning to be more awareness of and attention to this process.

POS locally that the staff had been asked to participate on state committees; in other cases, it was the other way around – because staff had been on state committees, they had momentum and brought back a vision to their local site about what POS should look like. *We did not hear much about state-provided training or professional development around POS*, and we assume that sites that were not involved with the state are much further behind in POS development.

The following are not necessarily overall findings, but rather examples of some interesting and relevant site-specific observations.

## **7) Technical Skill Assessments**

Only some of the sites facilitated the *opportunity for their students to receive industry-recognized credentials via technical skill assessments* in high school. Some certifications in areas like child care have a required work-based learning (WBL) component to hours towards certification or licensure. Unfortunately, since there may not be enough time for students beginning the CTE coursework during their junior year to log all of their WBL hours prior to graduating from high school, they continue working full-time after graduation rather than enrolling in college. This is because if students attend college full-time, they miss out on the window of opportunity to earn more hours toward licensure and risk losing the ones they've already built up while in high school. On the other hand, auto tech students can earn 2 ASE certifications while in high school toward their Master certification, and auto dealerships often pay for their employees to earn an associate's degree and manufacturer specific certification.

## **8) Work-Based Learning**

At one school (Site G), seniors in good standing are allowed to do a paid co-op. The school has a list of over 100 *local businesses who hire co-op students*; many students continue to work for these employers following graduation, either full-time or part-time while they attend college. The region is heavily working class and many families cannot afford to send their children to college full-time. The school takes pride in offering them skills for highly paid employment following high school; as the vice principal said, “we don't train auto technicians to work at Jiffy Lube; they are going to be entry level technicians at dealerships. By the same token, we don't train our culinary students to work at McDonald's; many of them are continuing to culinary school or going to work in the hospitality business.”

## **9) Selective versus Lottery Admissions**

Only one school visited (Site G) used a *selective admissions process*. This school was a public, regional technical center that also offered academic courses, had recently undergone a \$36 million expansion, had a per-pupil expenditure of \$18,000 per year, all of their state-of-the-art equipment donated by business and industry, and the highest graduation rate in the state. The school had become so popular that the comprehensive high schools in the region complained that they were losing their good students in the competition. The selection process for this tech center involved a careful review of the students' history; it was not a lottery system. The school admitted “the high middle” kids, rather than the type of student traditionally found in “vo tech.” The other two tech centers we visited had fewer resources and admitted all interested students

from the local area on a part- or full-time basis. The students in these schools were probably more similar to the stereotype of CTE students. However, the example of the first school shows that, with enough resources, CTE-focused schools can be a very competitive option, particularly now that careers in skilled technical areas are becoming more acceptable, if not actively pursued.

### **Discussion and Conclusion**

The above is a summary of some of the issues that sites need to address as they move forward with design and implementation of POS. It is by no means a complete list; it is simply a compendium based on conversations and observations at eight sites. We are very grateful to each of them for opening up their schools to us so that we can learn how they have gone about developing POS. Our preliminary visits clearly showed that POS are not easy to implement locally, and that there are some common challenges facing sites. Many of those we visited had met and negotiated these challenges; others were still struggling. However, all of the sites seem to have achieved some measure of success at what they are attempting.

As mentioned earlier, we will study three of the sites (D, F, and H) in much greater depth as this study moves forward, including following students who began in high school POS course sequences and continued into college. We are aware that the sites that we selected to visit, and those we selected to include in the longitudinal study, may not necessarily be the most mature POS in the country. However, we believe that because of the progress they have made and the geographic and programmatic variation between and among them, they will make for interesting and informative case studies. We hope through this study to identify which components of POS are critically important, which are not, and what might be missing from our conceptual model.

This study has important implications for the field. POS are a culmination of many years of attempts to invigorate, strengthen, and streamline CTE programming from the secondary to the postsecondary levels. An evidence base is needed to determine whether POS actually work and how they map onto the Perkins legislation. If successful, POS will not only engage youth but increase their academic performance and guide them through college completion with a degree or certificate that will help them obtain family-supporting work in promising careers. Policymakers, analysts, and practitioners can use this information to develop evidence-based academic and career preparation POS and transition practices, thus providing students with viable opportunities to not only plan for and engage in academic and career-related pursuits, but also to succeed.

In conclusion, we think this report reflects only the tip of the iceberg of what promises to be a very important and revealing study about the implementation of POS from the Perkins IV legislation.

## References

- Elmore, R. F. (1980). Backward mapping: Implementation research and policy decisions. *Political Science Quarterly*, 94, 601-616.
- Lewis, M. V., & Kosine, N. R. (2008). *What will be the impact of programs of study? A preliminary assessment based on similar previous initiatives, state plans for implementation, and career development theory*. Louisville, KY: National Research Center for Career and Technical Education, University of Louisville. Retrieved from [http://136.165.122.102/UserFiles/File/pubs/POS\\_Study\\_Morgan.pdf](http://136.165.122.102/UserFiles/File/pubs/POS_Study_Morgan.pdf).
- Programs of Study Joint Technical Working Group. (2009, January). *Programs of study: Year 2 joint technical report*. Louisville, KY: National Research Center for Career and Technical Education, University of Louisville. Retrieved from [http://136.165.122.102/UserFiles/File/Tech\\_Reports/POS\\_Joint\\_Technical\\_Report\\_Jan\\_2010.pdf](http://136.165.122.102/UserFiles/File/Tech_Reports/POS_Joint_Technical_Report_Jan_2010.pdf).
- Recesso, A. M. (1999). First year implementation of the School to Work Opportunities Act Policy: An effort at backward mapping. *Education Policy Analysis Archives*, 7(11). Retrieved from: <http://epaa.asu.edu/epaa/v7n11.html>.
- Soy, S. (1997). *The case study as a research method*. Unpublished paper, University of Texas at Austin. Retrieved from <http://www.gslis.utexas.edu/~ssoy/usesusers/1391d1b.htm>.
- U.S. Department of Education, Office of the Undersecretary, Policy and Program Studies Service. (2004). *National Assessment of Vocational Education: Final report to Congress: Executive summary*. Washington, DC: Author.
- Yin, R. K. (2009). *Case study research: Design and methods* (4<sup>th</sup> Ed., Applied Social Research Methods Series, Vol. 5). Los Angeles, CA: Sage.

## Technical Appendix

### *Sample and Method*

**Data collection at selected sites - Student cohorts.** On their consent forms, students were asked for their consent to be part of the study for the next three years (through June 2012). For those students under 18, letters were sent home to parents (in accordance with IRB requirements). In addition to surveys, transcript data for each cohort will be collected from the high school and/or the college at the end of each academic year.

### *Current Status and Accomplishments*

**Site permissions.** AED has received permissions from the community colleges at the three sites and most of their feeder high schools. In some cases, we were required to complete a research request to submit to the school districts. In all cases, letters explaining the study were sent to districts, principals and college administrators. All colleges and school districts had the chance to review all of the permission forms for their students (and parents, in the case of high schools).

**Instrument development.** Surveys for high school and community college students were developed in collaboration with the other NRCCTE POS projects (University of Louisville, Clemson University) using several national surveys as sources. The high school survey was piloted by the Clemson University team and underwent OVAE review. The revised high school survey, focus group questions, interview protocol, and parent and student consent forms were submitted to Chesapeake Research Review for a review of procedures and protocols; approval was granted on April 13, 2009. The college student version of the survey and consent form will be finalized and approved in the summer, prior to the Fall 2009 data collection at the colleges.

Surveys were formatted and printed by an outside vendor, with a preprinted removable cover page with students' name and IDs (these are kept by the PI in a locked file cabinet). The same vendor entered the data when the surveys were returned and submitted the data files to AED for each site. Analyses are currently underway.

**Data collection.** The first round of data collection was successfully completed at the high schools in all three sites in April-May, 2009. Information letters were sent home, via the participating high schools, to parents of all juniors and seniors in the POS of interest at each site at least one week prior to our visit. Very few parents returned the forms indicating that they did *not* want their child to participate. Student surveys and focus group, as well as high school instructor, counselor, and administrator interviews, were conducted successfully at all three sites, with one exception. The primary feeder school district for the Southwestern site did not allow us to conduct student focus groups. Unfortunately, our visit to this site also occurred over a nationwide "skip day" that we were not aware of, meaning that fewer students than anticipated were available at the schools we visited that day (April 20). However, we estimate that approximately 75% of the eligible sample of students completed the survey. Although this may have introduced bias (i.e., we only got the responses of students who chose *not* to skip school that day), the fact that this site had the most high schools and therefore the most students overall (highest *N*) out of the three sites somewhat mitigates the reduced sample size in this site.

FIGURE 1. Target sample and comparison group.

