LESSONS LEARNED

from
HIGHLY
IMPLEMENTED
PROGRAMS OF STUDY

BY NATALIE STIPANOVIC, ROB SHUMER, AND SAM STRINGFIELD

American businesses and industries have long identified shortages in key career and technical areas—some of these areas require two- or four-year college degrees, whereas others simply require industry certifications. Career and technical education (CTE) has the potential to play a central role in filling these gaps.

The current Carl D. Perkins Act (Perkins IV), reauthorized in 2006, seeks to prepare individuals for both college and careers. Programs of Study (POS) are a central component of Perkins IV. Developed to provide a systematic means of connecting secondary and postsecondary programs, POS connect secondary and postsecondary institutions, include rigorous academic content aligned with standards, lead to industry-recognized credentials, and provide options for dual credit or concurrent enrollment.

In order to evaluate the impact of POS, the National Research Center for Career and Technical Education (NRCCTE) commissioned three longitudinal, field-based studies that focus on efforts being made to implement POS across the country. In 2009-2010, the NRCCTE conducted a cross-site evaluation of these three studies. This evaluation gave us the opportunity to explore lessons learned regarding POS across three schools that were identified as having a high level of POS implementation. Our goal was to compare common elements across the schools in order to uncover key components that could be shared with others actively involved in developing more effective POS.

During the study, we conducted more than 40 interviews with a variety of school personnel, including CTE and academic teachers, school counselors, CTE and high school administrators, and state directors of CTE. We also conducted interviews with business and community representatives in order to understand the relationships between the schools and local industry. Interview data were evaluated using a computer-based qualitative program that generated six predominant themes that describe what highly implemented POS look like.

Six Central Findings of Highly Implemented POS

- **Engagement:** At each site, school personnel talked about the power of POS to engage students in learning, primarily by connecting academics to meaningful learning experiences through engagement in work-based and project-based learning. POS were described as helping students "learn by doing" by getting them involved in activities and environments that allowed them to engage in applicable skills.
- **A system developed to support learning:** POS were established to ensure that learning—both academic and skill-based—was the primary activity of students. Learning was supported with appropriate systems. For example, block schedules were implemented to allow students sufficient time to learn content in greater depth; academic and CTE teachers were provided with planning time to engage collaboratively in lesson and project planning.
- **Certification of knowledge and skills:** As mandated by Perkins, CTE components were supposed to result in some kind of industry-recognized certification. Students were also asked to demonstrate competence in academic subjects by applying academic knowledge in CTE contexts.
- **Seamless education:** The impor-

> "Developed to provide a systematic means of connecting secondary and postsecondary programs, POS connect secondary and postsecondary institutions, include rigorous academic content aligned with standards, lead to industry-recognized credentials, and provide options for dual credit or concurrent enrollment."

tance of developing a seamless educational system connecting primary and secondary education to college was articulated across the sites. POS at these sites actively linked high schools with community colleges, ensuring that students engaged in a series of courses and activities that taught them about careers and the application of academics in real-world contexts.

- **Increased understanding and respect of CTE:** Although CTE was traditionally seen as a "dumping ground" for less able students, POS appeared to be changing that perception at our sites. Students of all abilities were increasingly attracted to CTE, especially when several dual credit-earning options provided parity with highly regarded academic programs like Advanced Placement courses.
- **High-quality teachers made a difference in the delivery of POS:**

Attracting and retaining high-quality teachers was considered essential to making POS work. Many interviewees emphasized the value and timing of instructional systems embedded in CTE programs that require teachers to possess higher levels of instruction, knowledge and reflection. High-quality teachers were described as knowledgeable about their subject areas and able to integrate academic and CTE instruction, establish trusting relationships, and deliver instruction through project-based instructional strategies.

POS Design Framework

We further evaluated our study data in an effort to determine how the sites had incorporated the Career and Technical Programs of Study Design Framework, which was developed by the U.S. Department of Education's Office of Vocational and Adult Education (OVAE). The Framework consists of 10 elements deemed essential for good POS practice.

Legislation and policies: Each of the sites had been implementing something resembling POS for several years, but it was clear that legislation and policies made the development and implementation of POS more feasible—creating a sense that programs had to move from existing "on paper" to functioning in reality. One good example of the effects of legislation and policy is South Carolina's Personal Pathways to Success program, which funds school counselors and career specialists, engages youth, families and counselors in identifying a career pathway, and focuses students on planning their futures with career outcomes in mind.

Partnerships and collaboration: Partnerships took a variety of forms, with each site developing an array of partnerships between secondary and postsecondary, business and education, teachers and community members, and students and teachers. One of the more valuable partnerships consisted of advisory committees composed of business and industry personnel. Members of these councils met regularly with secondary and postsecondary faculty to design courses and curricula, identify certifications and approaches to employment, and provide up-to-date information on local employment needs.

Professional development: All three sites engaged in professional development efforts. In some sites, this occurred more informally; in others, the process was well supported by the school district and community college system. Most professional development efforts focused on pedagogical training, and the integration of academic knowledge and skills with applied learning.

Accountability and evaluation systems: Accountability and evaluation systems were in place at each site to track students' progress and their level of participation in CTE. However, each site reported some level of difficulty in collecting reliable information on students and tracking them as they transitioned from high school to postsecondary education programs.

College- and career-readiness standards: All sites viewed college- and career-readiness standards as including both academic and career-related knowledge and skills that would allow each student to graduate with a career plan that connects to higher education and employment. In one site's state, all students complete a graduation plan that includes post-high school activities. In another state, sites encouraged students to complete dual enrollment courses and graduate with college credits.

Course sequences: Course sequencing was a functional component of POS at all three sites, but took different forms. At one, students planned their high school curriculum by taking a sequence of courses that prepared them for a particular career. POS course sequences often spelled out the names, numbers and types of courses required for particular career objectives. At another, many courses were co-taught on the community college campus. Courses with dual credit status had been aligned in a logical, non-duplicative sequence from secondary to postsecondary. At the third site, all systems collaborated to align courses to ensure continuous movement through a sequence of skills that led to the next level of education and career competence.

> "Our numerous interviews with those engaged in highly implemented POS revealed that collaboration and effective communication played pivotal roles."

Credit transfer agreements: Credit transfer agreements existed at all three sites. The most common form was a list of courses that qualified for dual credit at both the secondary and postsecondary levels. Collaborations between schools and local community colleges provided specific courses with credit transfer or dual credit options.

Guidance counseling and academic advisement: Guidance counseling and academic advisement played an important role in all three sites. First, early exposure to CTE and career options was identified as necessary in helping students to begin thinking about careers. Second, academic and career planning were identified as important to students' long-term success. Third, CTE teachers not only provided valuable information to students and school personnel about the skills and training needed, but they also provided "real life" insights about the inner workings of their field. Community college personnel also provided career guidance and program information to high school students as a means of encouraging them to take dual credit courses and recruiting them to enroll at the college.

Teaching and learning strategies: Each site mentioned exemplary programs like Project Lead the Way and High Schools That Work as models for their most important teaching strategy, project-based learning. Teachers and administrators believed that involving students in projects, especially those that connected to real-world activities, helped motivate students to learn and provided a platform to ensure that learning was achieved and applied.

Technical skill assessments (TSAs): All sites provided examples of TSAs used to measure student achievement. The most prevalent were those created by NOCTI (the National Occupational Competency Testing Institute). We also saw the use of occupationally specific skills or knowledge. Each of the sites also used TSAs carried out by career and technical student organizations like Future Farmers of America (FFA) and Health Occupations Students of America (HOSA).

Lessons Learned

Our numerous interviews with those engaged in highly implemented POS revealed that collaboration and effective communication played pivotal roles. Collaborations with institutions like community colleges and career centers provided many of the supports needed to develop comprehensive POS, and support the alignment of educational initiatives with the needs and standards of business and industry. Further, collaboration between academic and CTE instructors provided the relevance students needed to make learning both interesting and useful. Developing relationships with businesses and industries provided both the support and expertise needed to develop relevant programs and work-based learning opportunities for students.

Time will tell if POS continue to transform and expand opportunities for students to gain the academic and technical knowledge and skills needed to become college- and career-ready. **T**

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Developing POS via a Statewide

CAREER-FOCUSED

BY CATHERINE MOBLEY, CATHY HAMMOND, CAIREN WITHINGTON, SAM STRINGFIELD, NATALIE STIPANOVIC, JULIA L. SHARP, AND SAM DREW

Career-focused education offered through programs of study (POS), career pathways and career and technical education (CTE) can provide students with opportunities to engage in career exploration and development, to establish career goals, to increase academic knowledge and skills, to test career preferences in applied settings, and to make links between coursework and postsecondary careers and education (Kalchick and Oertle, 2010; Stipanic, Lewis, and Stringfield, *in press*). Given the potential of these types of education reforms, federal and state legislation has been enacted to foster their development.

In 2005, South Carolina (SC) initiated a particularly innovative approach to career-focused education through the Education and Economic Development Act (EEDA). This legislative mandate, developed with the backing of the state's business community, aims to improve student achievement and preparedness for postsecondary education and high-skill, -wage and -demand jobs. It does so through a focus on career awareness and exploration and the creation of locally relevant career pathways and POS.

EEDA is one of the most comprehensive career-focused school-reform mandates in the country. The state policy mandates that all schools and students participate in career-focused education, and it incorporates almost all of the components of the recently published Office of Vocational and Adult Education (OVAE) CTE design framework (OVAE, 2010), which includes the four core requirements for POS plus 10 components considered to be supportive to the development of POS.

We are studying components of EEDA implementation most relevant to high schools, and investigating the influence of these components on students and POS development over a five-year period in a

REFORM POLICY

sample of eight SC high schools. These high schools were carefully selected for diversity in the degree of initial levels of policy implementation, local economic conditions and levels of school and community resources, as well as in size, location and student demographic characteristics (Sharp et al., 2011). We are in the fifth year of collecting data from three cohorts of students who, because of their progression in school, have different levels of exposure to the EEDA reforms.

Data gathered during the project's first four years indicate that the comprehensive career-focused school reform efforts of EEDA appear to be helping to build

some of the foundation and framework necessary for the development and successful implementation of career pathways and Perkins IV-defined POS. Although data gathering and analysis are ongoing, in this article we provide early insights into how several key elements of the SC policy are helping our sample schools lay a foundation for POS and POS-like educational components for all students.

Career Guidance Is a Central Component of the POS Framework

We have found that enhanced career guidance and counseling services are critical to the EEDA reform policy. Providing

students and parents with information and support to explore diverse career options plays a key role in students' career development and career planning. Under EEDA, students must be exposed to career development in elementary and middle school through the exploration of career pathways and career interests. In eighth grade, each student, along with parents or guardians, is to work with a counselor to develop an Individual Graduation Plan (IGP), which includes courses required for graduation and appropriate electives that align with the student's career interests, postsecondary plans and professional goals. In high school, EEDA states that
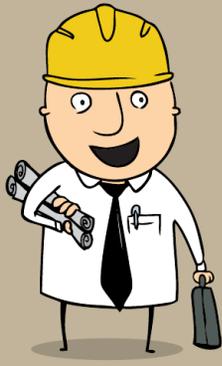
"The IGP process has allowed students to learn how to establish and track career goals, and to select and plan coursework for a career pathway or POS; helped reduce any historically present stigma associated with CTE; often facilitated academic-CTE discussions and interactions; and has helped to initiate discussion about how to integrate courses into seamless career/POS pathways."

students are to meet with counselors and parents on an annual basis to review and revise their IGPs. School counselors or others with career development facilitator certification must provide students with career awareness and career exploration activities and opportunities for work-based learning experiences.

Evidence from our study indicates that EEDA has increased the amount and variety of career planning activities and guidance that students are receiving, and has changed the roles of many guidance counselors in these schools. The policy has increased the depth and breadth of information that students receive about educational and career opportunities, with school counselors playing a key role in providing these activities and information.

Counselors report spending more time engaged in one-on-one career counseling with students, and making a greater effort to engage parents in the course and career planning of their children. Students most frequently identified school guidance counselors as the most helpful in IGP development. The EEDA approach appears to be providing a more systematic process for students' career planning, and highlights the key role of guidance and guidance counseling in the successful implementation of the statewide mandate.

IGPs Help to Establish a Career-focused Planning Process

A key to much ongoing change in sample schools is the development and maintenance of students' four-year IGPs. The IGP process was designed to be the core

organizing tool that prepares students to focus their planning efforts and make their journey through and beyond high school. At our sample schools, IGPs have helped students gain access to career skill assessments, set career goals, and select and plan for specific career pathways in order to work toward graduation and beyond.

The process helps to identify the types of courses and programs needed to achieve these goals, including CTE, academic and dual credit course options. School personnel consistently described the IGP as a valuable new tool for career counseling and planning for all students. Many students reported during focus groups that they benefitted from this process because it gave them an opportunity to select a career pathway that reflected their goals, skills and interests; helped them organize their high school coursework; and often added meaning to their high school experiences. Without such a process, many students would not have access to the tools and information needed to establish realistic career goals and to select career pathways or POS.

One of the benefits of career exploration through this process is that students can not only identify and explore areas that interest them as a post-high school career, but they can also identify areas that do not appeal to them as career choices. During student focus groups, we noted that, regardless of whether students had identified a specific career goal, many students seemed at least to have learned through the IGP process new ways of

thinking about and planning for the future, including establishing and tracking personal career goals.

Career-focused Reform Can Help to Facilitate CTE-Academic Interactions

Career pathways and POS are designed to include a mix of academic and CTE courses. EEDA aims to bring career-focused education and career pathways to all students, whether or not they are formally enrolled in CTE programs, and the state policy encourages collaboration among traditional academic and traditional CTE spheres.

Our data suggest that EEDA, and particularly the IGP process, has increased the knowledge and awareness of guidance personnel of the CTE programs and courses available to students at their schools. There is also preliminary evidence of changes in CTE participation as a result of EEDA implementation. CTE teachers at a number of schools reported not only more students being directed into their courses, but also more appropriate placement of students in CTE courses and programs. At several schools, CTE teachers and school counselors reported that any stigma associated with taking CTE courses or attending a career center has been reduced post-EEDA.

As in other change efforts, levels of early implementation have varied. In some schools we found that the policy is not yet having its intended effect on the mixing of CTE and non-CTE courses, or promoting collaboration between CTE and non-CTE teachers. Also, counselors and some

students reported challenges with CTE course-taking and scheduling—such as facing tradeoffs between taking CTE and academic core courses, Advanced Placement courses and non-CTE dual credit courses. For example, taking CTE courses instead of AP courses could cause grade point averages to suffer or make meeting core curriculum requirements difficult. Where not adequately addressed, these challenges are hampering efforts to integrate CTE and academic programs into seamless POS pathways.

Conclusions

Early observations from our study exploring the influence of South Carolina's EEDA on student outcomes and the development of career pathways and POS contain some lessons for those planning to implement similar reforms. First, components of the reform are helping to build some of the foundations and framework considered necessary for the development and successful implementation of Perkins IV-defined POS and other career pathways.

Added school guidance personnel have been essential to the early implementation of this comprehensive school reform effort and in establishing several of the components for the foundation for POS. Through their efforts, and the efforts of other school personnel, EEDA has increased career exploration and planning opportunities for students in all of our eight sample high schools, with the mandated IGP process playing a key role. The IGP process has allowed students to learn how to establish and track career goals, and to select and plan coursework for a career pathway or POS; helped reduce any historically present stigma associated with CTE; often facilitated academic-CTE discussions and interactions; and has helped to initiate discussion about how to integrate courses into seamless career/POS pathways.

In addition to these positive factors, we found challenges to implementation across schools. These challenges often related to the amount of buy-in of the school and district to the reform policy and the level of resources for implementation—both of which varied across sample schools. Implementation of such a comprehensive reform requires resources and commitment at the classroom, school, district and state levels. Local availability of jobs and job-shadowing opportunities in the specific communities, resources available within the school districts, declining state funding for EEDA and other educational services, and increased demands placed on school personnel all impacted implementation levels. Several of the sampled schools lack some of the basic resources necessary to design and implement an array of POS, and in some high poverty rural areas we found little potential for this situation to improve in the near future. **T**

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SCHOOL CULTURE

in Improving Student Achievement in POS

BY KIRSTEN SUNDELL, MARISA CASTELLANO, LAURA T. OVERMAN, AND OSCAR A. ALIAGA

Over the past five years, the National Research Center for Career and Technical Education (NRCCTE) has sponsored five research studies of Programs of Study (POS)—including three ongoing longitudinal projects—with the goal of informing the field about how and under what conditions POS impact student engagement, achievement, and transition to postsecondary education and employment. POS, mandated under Perkins IV, increase program accountability in the areas of academic achievement, technical skills achievement and alignment with postsecondary education.

Our longitudinal study, *Rigorous Tests of Student Outcomes in Career and Technical Education (CTE) Programs of Study*, was designed to estimate the impact of POS on high school students' academic and technical achievement outcomes through the completion of high school. For the past four years, we have followed two

cohorts of students from the Class of 2012 in two large, urban school districts that offer POS.[1] Each year, we collect student outcome data and conduct site visits to treatment and control or comparison schools; we observe academic and CTE classes and interview students, teachers, counselors and administrators in order to get a better sense of the experiences of students attending POS compared to students not attending POS.

At this point in our study, we have acquired and analyzed ninth- and tenth-grade student outcome data (e.g., grade point averages, test scores, technical skills assessments, and other measures) and site visit data. (By the time this issue of *Techniques* appears in print, we will be in the process of analyzing our students' eleventh-grade outcome data, which will not be available until fall-winter 2011-2012.) Our ninth- and tenth-grade results have been published in a series of reports, journal articles and conference presenta-

tions available on the NRCCTE Web site. This article describes our two districts and study schools and summarizes what we have learned about how district and school policies, practices and cultures support the implementation of POS and promote student success in preparing for life after high school.

West District: A Commitment to Cutting-Edge CTE[2]

Located in a large city in a western state, West District serves an urban-suburban student population, 64 percent of whom self-identify as ethnic minorities, and more than 40 percent of whom are eligible for free lunch. Three POS high schools are participating in our study. *Navy* is a new high school in which CTE and academic programs are housed together in modular units customized by teachers and business community partners. It was designed around the "best practices" principles of learning

"Four years of data collection and site visits to our study schools have shown us that POS offer students rigorous, engaging instruction in academic and technical content areas."

communities, project-based learning (PBL), and the expectation that students will earn postsecondary credits. *Sky*, the district's 40-year-old former career center, has greatly strengthened its academics. It boasts a strong pass rate on state achievement exams and offers many AP classes alongside its CTE. *Azure*, a magnet high school composed of wall-to-wall academies, offers high-tech CTE like engineering, network, and information technology and has a long-standing reputation as a high-performing school.

During visits to our treatment schools, we found plentiful resources and organizational structures supporting CTE and more specifically POS. West District has a strong commitment to CTE; indeed, its POS schools were designed and created to improve student achievement, promote diversity, and create an awareness of career opportunities related to POS. West's POS schools offer modern CTE technology and curricula, and provide students with the opportunity to learn all aspects of an industry and earn postsecondary credits while still in high school. All three of our study schools, Navy, Sky, and Azure, use innovative teaching techniques, particularly PBL practices that apply academic and technical content knowledge to career contexts. All three also possess unique school cultures that foster career- and college-readiness.

Navy: Integrated technology, project-based learning and a culture of support. A hallmark of Navy's POS are modern, industry-grade facilities and the integrated use of instructional

technology. Its culinary and hospitality programs benefit from a full-size banquet hall, industrial kitchens and demonstration classrooms that rival those of the local community college. The culinary program's course content—including textbooks, instructional videos, podcasts, blogs, assessments, recipes and other resources—are now cloud-based, and teachers interact with students in an online platform that integrates instruction and assessment with social media.

Navy's POS are structured around PBL, and all teachers receive intensive professional development and support related to implementing PBL in their classrooms. Although all programs engage in class-specific PBL, Navy also sponsors school-wide PBL events that bring students, teachers, parents and community members together around such themes as space exploration and Earth conservation. Navy's culture supports students and teachers. An advocacy period allows students to receive mentoring and advising from teachers who remain with them throughout high school. Teachers also benefit from the principal's open-door policy and commitment to supporting curricular innovation and ongoing professional development.

Sky: Familial culture, hands-on learning and professional skills. One of the district's oldest high schools, Sky possesses a familial sense of continuity, shared history and communal values that it communicates to new students through customs that encourage them to take pride in the school and their own

accomplishments. Sky's faculty and staff also actively promote the school as a place of excellence and achievement. The progenitor of the district's new POS high schools, Sky is currently being rebuilt to incorporate their modern features and equipment.

Sky's programs emphasize hands-on learning and integrated academic and CTE content. In the health occupations program, for example, teachers bring together biology, chemistry, math and anatomy in the service of understanding the body and its functions—all while allowing students to practice taking blood pressure and performing other medical assessments.

Sky's curriculum includes a required ninth-grade class that teaches soft skills, career exploration and standards of professional behavior. In class, students prepare resumes and four-year graduation plans and participate in mock interviews (that sometimes lead to job offers) with the school's business and community partners. Its busy Career Center serves as a model for other district high schools.

Azure: High achievement, self-awareness and targeted counseling. One of West District's highest achieving high schools, Azure blends academic achievement with high-tech career-themed programs and enriched co-curricular experiences. For example, the school hosts popular career and technical student organizations (CTSOs), like Future Business Leaders of America (FBLA), that supplement classroom learning. A business teacher we interviewed

stressed the importance of FBLA in imparting dress, networking, and written and oral communication skills to students, in addition to providing opportunities for business-related field trips and leadership development activities.

One counselor reported that Azure was full of self-described "nerds." The students we interviewed proudly concurred, describing their strong focus on schoolwork and goals. One said, "I feel really prepared because of the workload and the different ways that we are learning why we're doing something. Not just learning the actual topic, but the reasons behind it."

College and career counseling at Azure is divided between guidance counselors, who address four-year planning and college preparation, and program area teachers, who handle career-related guidance in the classroom. Unique to Azure is a ninth-grade counseling cohort model, instituted by the school's newest guidance counselor, that seeks to mentor and support freshmen socially and academically with activities related to academic planning, goal setting, study skills, career interest inventories, and use of the state's online career information system.

East District: Blending Learning with Real-World Career Experiences

Located in a large city on the East Coast, more than 66 percent of East District's students self-identify as ethnic minorities, and nearly half are eligible for free lunch. CTE in East District is a well-supported high school curricular component. East is located in a state with secondary-postsecondary statewide articulation agreements, assuring students a seamless transition and the opportunity to earn college credit that can be applied to an associate degree or postsecondary certificate program. Local articulation agreements also link the district and the local community college. Our treatment school, Blue Academy, is a state-of-the-art POS high school featuring three academies combining rigorous

academics with programs in engineering, medical sciences and biotechnology, and information technology. Many of Blue's faculty have had recent industry careers, and its CTE course sequences align with specific academic requirements and tangibly connect to careers in the real world.

Blue Academy: Caring, high expectations, and college and career preparation. Blue's school culture helps it maintain its focus on academic and technical achievement and the promotion of CTE as a means of attending college. This culture emphasizes caring and collaboration, high expectations, and college and career planning as part of all daily activities. Culture is communicated on multiple fronts using a variety of media, including posters in hallways, mandatory student planners, and closed-circuit monitors in each classroom that deliver a constant stream of interesting facts, school news and inspirational quotes.

Blue's principal introduced a corporate-inspired philosophy about implementing change through personal responsibility and positive interactions with others, and students appear to buy into this philosophy. High expectations are also visible in the staff's frequent monitoring of student progress and sponsorship of friendly competitions to spur higher achievement. College-going and career planning are championed at Blue and suffused into classroom activities. The school also offers many college- and career-oriented assemblies and field trips that expose students to postsecondary possibilities and potential employers.

Conclusions

Four years of data collection and site visits to our study schools have shown us that POS offer students rigorous, engaging instruction in academic and technical content areas. This is combined with opportunities to apply their knowledge and skills to the solution of real-world problems, earn college credits, familiarize themselves with careers, and connect

with local businesses and community partners. No less importantly, POS appear to be strengthened by school cultures, organizational structures, and instructional practices that emphasize academic and technical achievement, high expectations and preparation for life after high school. **T**

Endnotes

1   To learn more about our study's design and methods, please refer to our published reports, which are available on the NRCCTE Web site at **http://bit.ly/nmyFnk**.

2   The names of all districts and schools are pseudonyms.

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PROGRAMS OF STUDY: WHAT "MATURE" SITES TELL US

BY CORINNE ALFELD AND SHARIKA BHATTACHARYA

Although career and technical education (CTE) Programs of Study (POS) were introduced in the Perkins IV legislation, neither the spirit nor the elements of POS are new in the history of CTE as a vehicle for high school reform. POS have evolved over several decades of efforts to create effective transition programs from secondary to postsecondary education or the workforce. Initiatives of the 1990s like youth apprenticeships, School-to-Work, and Tech Prep all provided elements that formed the basis for POS, including an increasing emphasis on the integration of academic and technical skills (Lewis and Kosine, 2008). POS are a natural extension of these efforts.

Site Selection

As POS are relatively new, in name if not in practice, research evidence on their implementation and effectiveness is still in progress (see other articles in this issue). At the request of the Office of Vocational and Adult Education (OVAE), U.S. Department of Education, and the National Research Center for Career and Techni-

cal Education, researchers at the National Institute for Workforce and Learning began a study in 2008 to examine "mature" POS-like sites around the country, to learn about how they were developed and how they work.

We solicited nominations for sites to study from a variety of knowledgeable stakeholders. (For a description of the study's method and preliminary observation findings, see the article "POS: Observations on Process and Structure" in the January 2010 issue of *Techniques*.) Three sites were selected that met the criteria, primarily consisting of evidence of a strong secondary-postsecondary partnership with students moving from the high school to the college in a CTE program. Dual enrollment was a critical piece at the secondary level. The three selected sites are geographically, demographically, and programmatically diverse (see below). Each is anchored by a community college with multiple (between six and 12) feeder high schools.

After a site selection process that included site visits and interviews, the longitudinal study began in early 2009. Over the last three years, we have conducted additional site visits for each of the mature POS to interview administrators and faculty at the high school and college levels, as well as advisory committee members from the business community. These interviews and observations provided information for rich case studies of individual sites as well as the opportunity to compare and contrast across sites and with Perkins IV (more detail is available in the *Techniques* January 2010 article and in a forthcoming issue of the *International Journal of Educational Reform*).

Interview Findings

Overall, we found that the "mature" POS sites that we studied had successfully surmounted various barriers to developing POS over a timeframe of at least nine years. Common key elements of these mature POS include: (1) resources (primarily provided by the college) for staff dedicated to creating and maintaining POS relationships with high schools; (2) active business and industry advisory groups; and (3) uniquely tailored and flexible dual enrollment arrangements. Finally, at each site, high school and college leaders share a vision of seamless student transitions that ultimately benefit students, the college and the local economy. Without sustained attention to these aspects of partnership, these sites may not have been able to navigate the bumpy road to achieve mature POS.

On the other hand, because the programs were established before POS were legally introduced, they cannot be expected to meet all of the goals of POS. We did find some weaknesses when we retrospectively compared the programs to the 10 elements in the POS Framework released by OVAE in the second year of our study.[1] For example, both the qualitative and the quantitative data (see page 34) suggested that the role of high school counselors in career guidance could be improved. Furthermore, data systems for tracking students across educational levels were not yet well-coordinated. For the purposes of the research study, we collected transcript data from the high schools and the colleges and were able to track educational pathways for participating students who had transitioned to the affiliated college; however, such efforts were not being undertaken by administrators unless specific programs required the information for reporting, marketing or program improvement purposes.

Student Survey Findings

To understand students' perspectives and how they progress through these mature POS from high school to college, we administered surveys to high school juniors and seniors in each of the selected POS sites beginning in 2009. It should be kept in mind that the students who responded to the surveys are not necessarily representative of all students in their POS, let alone of POS students in general. However, their answers serve to complement the qualitative data.

Research Questions

1. What are the key elements of mature secondary-postsecondary career pathways? Who are the key players? What are the key policies and processes?

2. How do the key elements map back onto the Perkins IV legislation on POS?

3. What are the educational and career pathways of students who begin a POS in high school? Do they continue in college? What happens to students who do not continue in the POS in college?

Selected Mature Programs of Study Sites

Masked Site Name	Location	2002 City Population	Programs of Study Selected for Research
"River College"	Midwest/South	55,745	Industrial Maintenance, Mechatronics
"Desert College"	Southwest	529,219	Film Tech, Culinary Arts, Construction Technology
"Northern College"	North Midwest	67,145	Automotive Technology, Welding

"However, in our opinion, the measure of success for POS should not be defined by the rate at which students are guided into specific career paths or specific programs, but should instead be based on the capacity POS have for providing students with the ability to make future educational and career decisions using the skills they gained through their participation."

High School. At the high school level, we found the following:

- Only about half (52 percent) of the 219 students surveyed reported that their high school POS was the one in which they were most interested.
- Most (63 percent to 84 percent) agreed or strongly agreed that being in a POS made them more engaged in school and in preparing for a career.
- 81 percent agreed or strongly agreed that their POS "made me focus my studies so I know where I am headed."
- High school participants tended to discuss course planning most frequently with friends (96 percent), compared to parents (90 percent), teachers (83 percent), and guidance counselors (61 percent).
- However, parents were rated most helpful in course planning (31 percent, compared to friends at 18 percent); more students reported "no one" (21 percent) as being helpful over guidance counselors (17 percent) or teachers (13 percent).
- Only 32 percent had participated in a meeting with a parent and a counselor together regarding course planning.
- For the 61 percent of students who reported participating in work-based learning (e.g., internship, job shadowing, community service), less than one-third (30 percent) considered these experiences to be closely related to their future career.

- Even fewer students (21 percent) reported that their paid jobs were at least somewhat related to chosen careers.
- Students' high school transcripts indicate that at the River College site, eight students (17 percent of that sample) had earned a certificate in their POS area by the end of high school.

College. Because we were interested in whether and how students made the transition to the postsecondary portion of their POS, we followed them as they left high school and began college. Based on enrollment records, we learned that of the original 219 students, 73 (33 percent) attended the affiliated college (*i.e.*, the college that was part of our study) after high school. Of this group, 33 (45 percent) stayed in the same POS they were in during high school (this constituted 15 percent of the original sample). The remainder either:

1. did not go to college at all after high school;
2. went to other colleges; or
3. went to the affiliated college but did not stay in the same POS area (though 12 percent of this group stayed in a similar career cluster, based on their declared majors).

When we surveyed all students enrolled in the selected college programs, regardless of whether they were in our original sample (response N = 139), the most compelling findings included:

- Students who had attended one of the high schools in our study with a mature POS were more likely (29 percent) than students from other high schools (17 percent) to report that they felt "very prepared" for college-level studies;[2]
- Three-quarters of all students in the selected college programs agreed or strongly agreed that their CTE training helped them decide to continue their education after high school.

Conclusions

Whereas there is certainly room for improvement in these mature POS, the fact that almost half of the high school students (even more when examining career clusters rather than specific POS) who transitioned to the affiliated college remained in the same POS is testament to the strength of these POS. It is not surprising that, at this developmental stage, two-thirds of the students in our study scattered after high school. (Recall that only half of high school students surveyed in this study reported that the POS they were in was the one of most interest to them.)

However, in our opinion, the measure of success for POS should not be defined by the rate at which students are guided into specific career paths or specific programs, but should instead be based on the capacity POS have for providing students with the ability to make future educational and career decisions using the skills they gained through their participation. (Recall that 80 percent of POS students surveyed in this study agreed or strongly agreed that their POS "made me focus my studies so I know where I am headed.") If these are the intended outcomes of POS under Perkins IV, then whether students continue in a given career path or choose another may be less important.

Based on the findings from this study,

we are cautiously optimistic about the promise of POS to facilitate students' transitions from high school to postsecondary education and careers. Whether or not students follow a single path, POS have the potential to create a more tangible future (or set of possible futures) for students by giving them structure. Through POS offerings and career guidance about a range of education and career options beyond high school, students can be better prepared to achieve college and career success. **T**

Endnotes

1. http://cte.ed.gov/nationalinitiatives/rposdesignframework.cfm
2. This comparison should be interpreted with caution due to small and unequal sample sizes.

References

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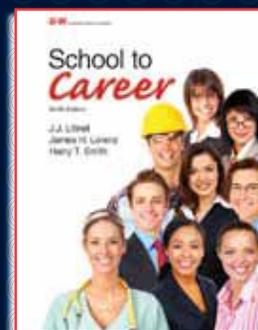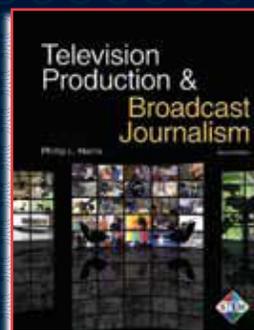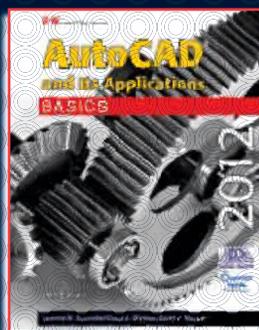
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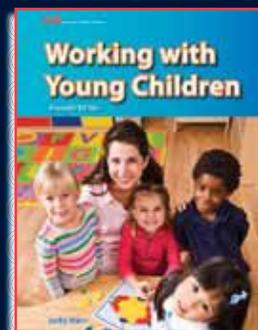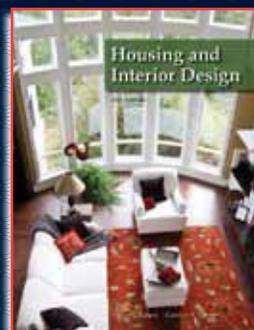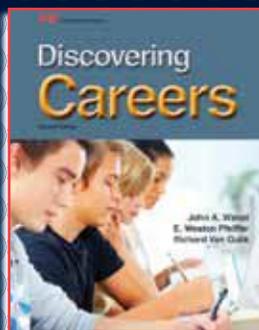
THE FUTURE

OF CTE: PROGRAMS OF STUDY

BY ROB SHUMER AND CYNTHIA DIGBY

Education in today's world is very challenging. From concerns over the funding of career and technical education (CTE) to discussions about the achievement gap and dropout prevention, to debates about what it means to be college- and career-ready, the role of CTE in educational reform paradoxically is both at the forefront and on the backburner of debate. With the focus of educational reform currently on science, technology, engineering, and mathematics (STEM), college access and retention, and passing high-stakes proficiency tests, the scope and value of CTE is in uncharted waters. Some believe that CTE is an important

and essential element of educational reform and success, whereas others feel that it is of limited use—for "those kids" who aren't going to make it in college and who therefore need some vocational training.

One of the more prominent programs in the 2006 reauthorization of the Perkins legislation was Programs of Study (POS). This initiative includes elements that connect it with past CTE efforts, yet POS have a focus and direction that make the initiative more potent than almost anything that has been supported by federal dollars in the past. POS have been described as the old Tech Prep, only with more teeth to make secondary-postsecondary articulations stronger and more real.

The National Research Center for Career and Technical Education (NRCCTE) has been conducting several research studies on POS, as described elsewhere in this issue of *Techniques*. Three are quantitative and longitudinal in nature, and two have been qualitative studies of POS efforts in several states. This article is about the first of the two qualitative investigations, *Six Stories About Six States: Programs of Study*. This study focused on how POS were developed, and especially on how technical assistance was provided to strengthen and improve them.

The Six States project report generated some major findings, including the power of project-based learning (PBL) and
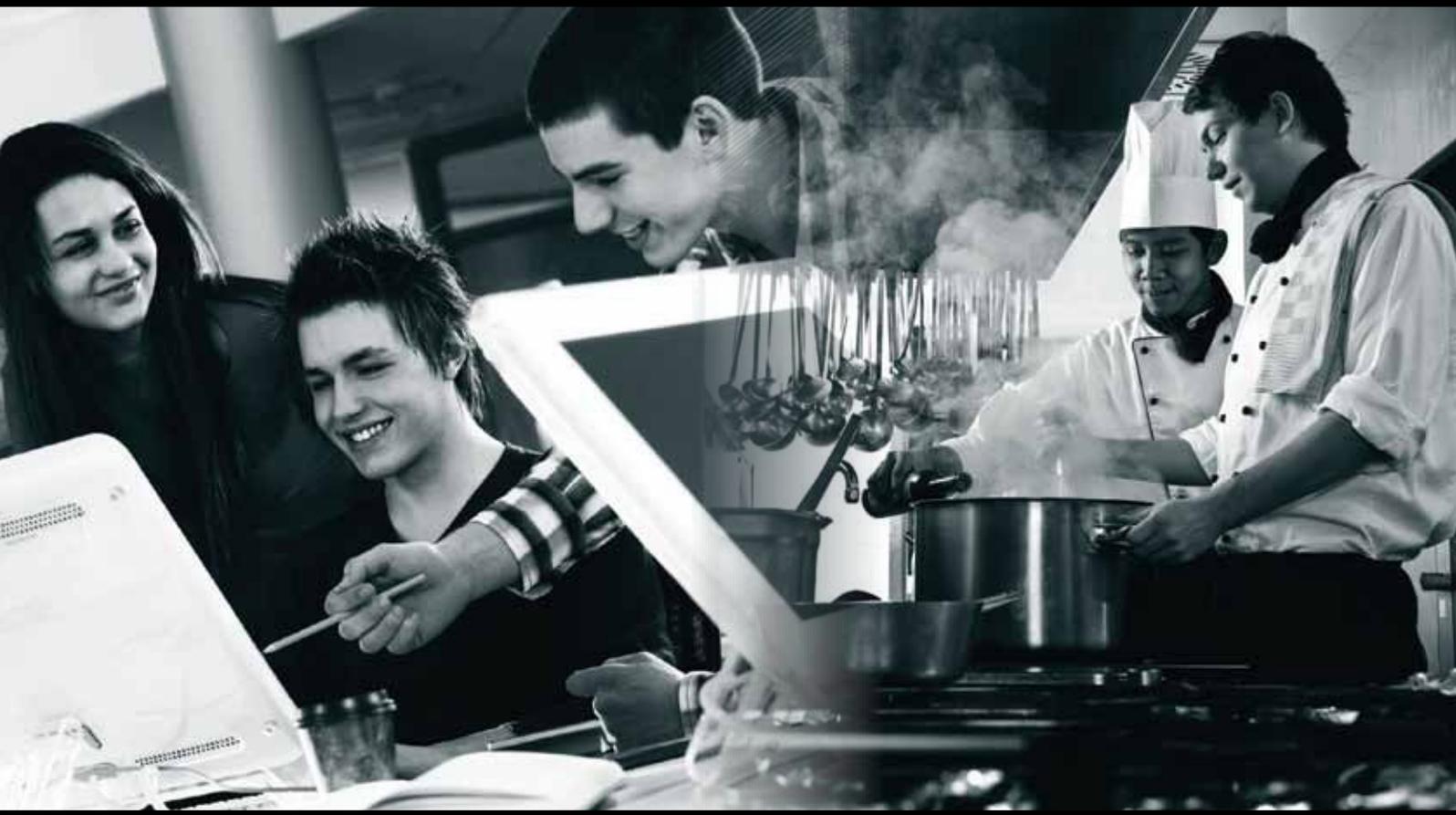
hands-on, active participation in both classrooms and in the community/workplace to sustain student interest, engagement and understanding. In study sites, skills and knowledge were also developed and enhanced through instruction that met both academic and workplace competency expectations. Such strategies led to improvements in student achievement outcomes. Districts and states in our study were able to cite data that showed that CTE students were doing well and even outperforming average, non-CTE students in their states. District and state data showed that students in POS had higher high school graduation rates.

The study supported what we've known for a while: Relationships matter. Several people interviewed noted that: "You have it backwards. It's not rigor, relevance and relationships; it's relationships, relevance and rigor." Good collaborations between educators and business and industry

stakeholders were especially important to ensuring rigorous academic and career-related POS curricula that would be relevant for the workplace. The successful development of these important instructional materials was considered a by-product of the cooperative, friendly relationships between education and business.

Findings

Some findings from the Six States study regarding the development of effective CTE and general educational reform program are listed here, not necessarily in the order of their importance.

Technical assistance is provided at both the state and local levels: Technical assistance for POS development came from both the state and local levels. Every state had a technical assistance team that was competent and passionate about ensuring the success of POS efforts.

Champions deliver much of technical assistance: At the state level, and often even more so at the local level, technical assistance was delivered by "champions," people deeply committed to CTE and program collaborations. Many came originally from Tech Prep and were able to leverage their knowledge of program components to forge better and stronger secondary and postsecondary collaborations, as well as articulated, aligned curricula.

POS are more than just about CTE—they are about basic educational reform connecting academic learning with real-world contexts: Most participants in the six states suggested that their ongoing POS system efforts were a positive force because these efforts promoted dialogue among and between the state, secondary and post-secondary institutions, and business and industry personnel. The POS system in

> "To keep improving POS initiatives, participants believed that it was necessary to continue to (a) develop collaborations between secondary and postsecondary and between academic and CTE instructors, and (b) pursue stronger articulations between courses, programs, and business and industry outcomes."

each state gave POS stakeholders a venue to critically think about what was being taught, what needed to be taught, and why it was important to have articulation and collaboration between educational systems and business to produce high-quality preparation for education, work and life.

Challenges to the Implementation of Programs of Study

Although most states appeared to be moving in positive directions, there were some challenges. Not all states involved had the same infrastructure or level of organization and collaboration between secondary and postsecondary education; nor did they have the same priorities for program development. Interviewees articulated the following challenges.

Cultural/mission misalignments between secondary and postsecondary, and between academic and CTE programs: A serious barrier for some POS programs was an inability to create necessary POS alignment and articulation agreements to meet POS mandates. This challenge was typically characterized as perceived mission misalignments between secondary, postsecondary, and business and industry stakeholders. The missions and focus of secondary and postsecondary institutions were highlighted as being different, partly due to the ages of the students they serve and their inability to operate independently in the world of adults and the world of work.

The demands of POS develop-

ment and certification require resources: Besides the time needed to build successful collaborations to develop curriculum and dual credit systems, a challenge mentioned in all states was the enormous amount of paperwork associated with documenting important POS components including: courses, aligned and articulated curricula, business and industry involvement, and other related elements. Most participants thought they would need more resources to address all the logistical and programmatic demands of the Perkins IV POS goals for 2013. Many states also regularly altered some of the POS forms and requirements, often requiring paperwork and POS efforts in progress to be changed or redone.

Issues with meeting required targets for POS "success": Meeting the expected POS targets of aligned and articulated instruction across secondary and postsecondary institutions, as well as ensuring that POS efforts lead to an industry-recognized credential or certificate at the postsecondary level, was problematic in at least a couple of ways. First, many suggested that measuring the success of POS is compromised because education and occupational pathways are not always linear. For example, when students leave a POS before completing the program to take a job, but later return to postsecondary education to complete a program, POS success targets are not met. Another example is if a secondary institution has alignment and articulation

agreements with postsecondary institutions that are out of the district, even if these agreements meet other POS requirements, POS success targets are not met.

Recommendations

Several recommendations arose from the data and analyses that could potentially improve the development and implementation of POS. These include:

Continue POS collaboration efforts: To keep improving POS initiatives, participants believed that it was necessary to continue to (a) develop collaborations between secondary and postsecondary and between academic and CTE instructors, and (b) pursue stronger articulations between courses, programs, and business and industry outcomes.

Streamline paperwork and the approval process to keep the process simple and consistent, and to remove some of the burden from educators and business and industry representatives: As noted by many interviewees, POS development efforts strained staff time and resources. However, many also commented positively on these efforts as hopefully leading to a more consistent and stable POS system in the future.

Special emphasis should be placed on teacher development and training models to connect academic instruction with real-world contexts: Individuals with a long history with CTE and an understanding of POS development efforts suggested that future POS could be strengthened by helping educators develop programs that used real-world contexts, such as work-based learning, as a platform for their academic instruction. CTE educators mentioned that academic educators were not taught how to use work-based learning contexts to teach academic concepts, and CTE educators were often not taught how to teach academic concepts through work-based activities.

Develop a publicity campaign to

further promote the value of POS: Many felt POS were still not well known in their states and that POS could benefit from a promotional campaign to inform the public, high school counselors, parents and students about their goals and benefits. Each state had POS exemplars that could be publicized so that students thinking about career plans and pathways would know about the many programs available to help them achieve their goals.

Recognize the legal and logistical restrictions for developing POS efforts and resolve them in realistic ways: Legal restrictions, especially for secondary students, prevented some from performing the workplace activities necessary for some POS. For example, there are laws in place that do not allow students under 18 to participate in certain forms of workplace training (e.g., x-ray technician), especially with regard to health and safety issues. POS need options to address these restrictions, while still allowing POS to meet mandated success targets.

Ensure sufficient information flow so that those "at the top" hear and react to the people "on the ground" delivering the instruction: Every state expressed concern about the tensions between the ideal of POS at the state level and the reality of trying to implement POS for people "on the ground." People at the state level were aware of these tensions. They suggested that more time, resources and opportunities for interaction were needed to support those actually implementing and teaching POS in school districts and community colleges. Also needed is a system structured to provide continuous feedback between the state and those implementing POS.

Conclusions

Our study of POS implementation in six states revealed that this CTE initiative is alive and well. Every state had already developed good models of POS and had already approved and authorized their adoption and implementation. Despite several challenges, POS are expanding in scope and numbers and becoming a more stable component of CTE for delivering articulated, documented, collaborative programs that successfully connect secondary, postsecondary, and business and industry.

Technical assistance in ongoing POS development efforts is frequently provided by people with Tech Prep experience. These personnel assist with all levels of course development and champion cross-institutional collaboration and instructional integrity. Time will tell how effective this technical assistance will be in creating a sustainable, effective system for delivering CTE that is integrally connected to academic instruction and produces educated and skilled employees for tomorrow's workforce. **T**

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