



THE EXTERNAL EVALUATION OF THE NRCCTE'S TECHNICAL ASSISTANCE:

Green-Focused
Programs of Study

The Evaluation Center
Western Michigan University

NRC CTE
National Research
Center for Career and
Technical Education

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**The External Evaluation of the NRCCTE's Technical Assistance:
Green-Focused Programs of Study**

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Executive Summary

The National Research Center for Career and Technical Education's (NRCCTE) Technical Assistance (TA) is intended to link the NRCCTE's TA work with practice by responding to state accountability and program needs related to the improvement of career and technical education (CTE) for secondary and postsecondary students. Implemented by the Academy for Educational Development (AED; now FHI 360), in collaboration with MPR Associates, Inc., the NRCCTE's TA centered on green-focused programs of study (POS) in Georgia, Illinois, New Jersey, Ohio, and Oregon. Specifically, these states received help in developing replicable "POS models that prepare secondary and postsecondary students for high-skill, high-wage, high-demand employment in positions associated with green-focused jobs in any of the 16 Career Clusters, including those aligned with the President's priorities for green technology in energy, housing, and construction" (NRCCTE, 2010, p. 1). TA activities included facilitated in-state meetings and a national Technical Assistance Academy (TAA), followed by further assistance via email, telephone and conference calls, and additional in-state TAA meetings. After the TAA, states were to develop action plans for POS model development and implementation, participate in the Career Clusters Institute, and deliver final reports, which were then published on the NRCCTE's website. During 2010-2011, the project continued by helping the participating states with "finalizing their green-focused POS models, designing implementation plans, and assisting local education agencies and postsecondary institutions in implementing the models in both urban and rural settings, as appropriate" (NRCCTE, 2010, p. 2) and also focused on developing a case study of lessons learned.

Study Overview

As part of its TA, NRCCTE and the U.S. Department of Education's Office of Vocational and Adult Education (OVAE) commissioned an external evaluation of the NRCCTE's TA services, with a specific emphasis on TA provided to develop green-focused POS. The questions addressed in the evaluation are:

1. What value did the TA add in the context of POS in the five participating states (Georgia, Illinois, New Jersey, Ohio, and Oregon) in comparison to those applicants that did not receive TA services (California, Florida, Guam, Kentucky, Louisiana, Maine, Michigan, Minnesota, Missouri, Pennsylvania, Rhode Island, South Dakota, and Tennessee)?
2. Is the TA facilitator model a good model for change? Can significant change as a result of TA be identified?
3. How can the TA be improved?

To address these questions, a multiple holistic case-study design included the five participating states (i.e., Georgia, Illinois, New Jersey, Ohio, and Oregon) and a comparison group of five matched comparison states (California, Kentucky, Michigan, Minnesota, and Pennsylvania). Multiple sources of information and evidence including semi-structured interviews, existing case studies, source documents, archival records, and websites were used to investigate the focal research questions. Using this method, data for single cases (i.e., states) were first examined and analyzed to identify consistent patterns and themes within cases. Then, a cross-case analysis determined which patterns were consistent and inconsistent across participating and

nonparticipating states. Ultimately, findings were synthesized across participating and nonparticipating states.

Key Findings

Overall, the NRCCTE's TA can best be characterized as a centralized effort to overcome discrepancies attributable to the decentralization of the U.S. educational system. States welcome the model because it increases cohesion without disregarding the uniqueness of individual states and state-level governance. In comparison to nonparticipating applicant states, participating states received value from the NRCCTE's TA in several important ways. First, the group of stakeholders included in the process was larger, more diverse, and more cohesive. Second, efforts were more focused and goal-oriented. Third, the POS development process was substantially more efficient. Fourth, it yielded an increased understanding of and compliance with OVAE's prescribed model for POS (U.S. Department of Education, Office of Vocational and Adult Education, 2010; hereafter, OVAE, 2010).

The facilitator model played a significant role in the TA. Facilitated in-state meetings increased participation by a broad stakeholder group drawn from state administration, secondary and postsecondary education, and industry partners. The national TAA in Washington, DC, helped to increase the understanding of federal expectations and guidelines and provided networking opportunities and knowledge sharing across states. The Career Clusters Institute in Denver encouraged states to focus on and make progress toward desired results. It also increased accountability because all participating states had to publicly present progress toward these ends. Throughout different activities associated with the TA, facilitators kept teams on task, provided knowledge and guidance, improved team communication, and contributed to POS model development and implementation overall. Without a facilitator in each state, progress likely would have been more limited. Participating states valued the knowledge and resource dissemination, collaboration, and communication afforded by the facilitator model because it helped improve existing POS, helped create new ones, and made observable progress toward anticipated outcomes. Moreover, state teams indicated sustained commitment by and perceived gains for the state and participating organizations as a result.

Generally, the TA has been worthwhile in that participating states are ahead of nonparticipating states in terms of developing and implementing green-focused POS. However, participating states are not necessarily ahead in the development and implementation of POS in general. A separate study would be needed to address that question. It is also unknown whether the facilitator model is the best model for implementing federal legislation. This study may serve as the basis for a more systematic study of decentralized efforts in developing statewide POS.

The External Evaluation of the NRCCTE’s Technical Assistance: Green-Focused Programs of Study

The National Research Center for Career and Technical Education (NRCCTE) and the U.S. Department of Education’s Office of Vocational and Adult Education (OVAE) requested an external evaluation of NRCCTE’s Technical Assistance (TA) with a specific emphasis on TA provided on green-focused programs of study (POS). Primary questions of interest include:

1. What value does TA add in the context of POS in the five participating states¹ in comparison with value added for those applicants that did not receive TA services?²
2. Is the TA facilitator model a good model for change? Can significant change as a result of TA be identified?
3. How can the TA be improved?

The evaluation project started in January 2011 and was divided into four phases:

- Phase 1: Planning and Design (January to March): This phase ended with a meeting between representatives of OVAE, NRCCTE, AED, and the evaluation team to resolve questions regarding the evaluation design and instruments.
- Phase 2: Initiation of the Evaluation (April 20 to May 18): HSIRB approval was obtained on April 20, 2011. On May 18, NRCCTE Director James R. Stone III sent a letter to possible participants in the study, explaining the nature and importance of the study, to encourage participation.
- Phase 3: Data collection (May 19 to June 17): Invitations to potential participants in the study were sent on May 19, 2011. Data collection, in the form of telephone interviews, began on May 23 and was completed on June 17.
- Phase 4: Data analysis and reporting (June 20 to July 31): Data analysis was initiated as soon as the interviews were completed, including transcription of interviews, coding, state-level analyses, cross-state analyses, and comparisons between participating and nonparticipating states. The targeted study is completed with this report.

To give context for the report, the following sections provide a brief overview of the NRCCTE, TA, and POS.

Overview of NRCCTE’s Technical Assistance Project

The U.S. Department of Education’s notice of solicitation for the NRCCTE states that the Carl D. Perkins Career and Technical Education Improvement Act of 2006 (also known as Perkins IV) required the Secretary of Education to provide TA to states. The TA is intended to develop, improve, and identify “the most successful methods and techniques for providing career and technical education programs assisted under the Act” (National Research Center for Career and

¹ TA participating states were Georgia, Illinois, New Jersey, Ohio, and Oregon.

² Applicants that did not receive TA funding were California, Florida, Guam, Kentucky, Louisiana, Maine, Michigan, Minnesota, Missouri, Pennsylvania, Rhode Island, South Dakota, and Tennessee.

Technical Education, 2006). Moreover, this TA should:

- Be appropriate for state needs.
- Reach a large number or proportion of CTE programs, teachers, and administrators.
- Assist states in the implementation, identification, or improvement of CTE program performance and student achievement.
- Assist states to improve the data quality of accountability systems.
- Support replication of instructional approaches, methods, programs, models, and strategies shown to be effective using scientifically based research. (National Research Center for Career and Technical Education, 2006)

The corresponding overarching purpose of the NRCCTE's technical assistance project is to link its work with practice by responding to state accountability and program needs related to the improvement of CTE for secondary and postsecondary students. Implemented by the AED in collaboration with MPR Associates, Inc., TA concentrated on green-focused POS in Georgia, Illinois, New Jersey, Ohio, and Oregon from 2008 to 2010. Specifically, these states received help in developing replicable "POS models that prepare secondary and postsecondary students for high-skill, high-wage, high-demand employment in positions associated with green-focused jobs in any of the 16 Career Clusters, including those aligned with the President's priorities for green technology in energy, housing, and construction" (NRCCTE, 2010, p. 1). TA activities included facilitated in-state meetings, a national Technical Assistance Academy (TAA) in 2010, and further assistance via email, telephone and conference calls, and additional in-state meetings. With this TA, states were to develop action plans for model development and implementation, participate in the Career Clusters Institute in June 2010, and deliver final reports, available on NRCCTE's website.

In 2010-2011, the project continued by helping the participating states with "finalizing their green-focused POS models, designing implementation plans, and assisting local education agencies and postsecondary institutions in implementing the models in both urban and rural settings, as appropriate" (NRCCTE, 2010, p. 2) and also focused on developing a case study of lessons learned. A second strand of TA was then to be initiated; this strand is not addressed in this study.

Overview of Programs of Study

The 2006 Perkins IV legislation (P.L. 109-270, Perkins IV) introduced POS and made the implementation of at least one POS a requirement for all secondary and postsecondary funding recipients. The logic behind mandating POS is the belief that they will facilitate students' transition from secondary to postsecondary education.

Since the early 1900s, the primary means for implementing federal policy has been via state plans. Lewis and Overman (2008) described the typical state plan as a description of "how it will work with its local districts to implement the activities required or authorized by legislation, and how it will evaluate the degree to which these activities are achieving the objectives of the legislation" (pp. 217-218). States submitted their plans for addressing all of the Perkins IV funding requirements on April 1, 2008. Sections of these plans focusing on POS were formulated

according to the guidelines outlined in Perkins IV. Some components of POS were already developed in prior initiatives, such as Tech Prep, career pathways, or youth apprenticeships (Lewis, 2008). However, these early initiatives did not have the desired and anticipated effects on postsecondary education outcomes. By contrast, POS are intended to lead to tangible results. In essence, each course in a POS has a clear purpose and is located within a sequence resulting in opportunities to earn postsecondary credit and an industry-recognized credential; clarity and transparency are key characteristics of an effective POS (AED, MPR Associates, Inc., & NASDCTEc, 2010).

To date, research on planning and implementing POS at the state level has shown that states vary greatly in how they approach the development and implementation of POS. Based on the Career Clusters framework, some states planned to use a regional approach to development, whereas others provided locals with a conceptual framework and a mandate for implementation (NASDCTEc, 2007). Lewis and Overman (2008) reviewed the methods proposed in Perkins IV state plans, finding that two-thirds of the states reported that local districts would have primary responsibility for developing POS using criteria and templates provided by the state and that all states would approve local plans and provide technical assistance and professional development. Only one-third of states referred to a statewide articulation agreement that would allow students who had earned postsecondary credit while still in high school to have these credits recognized and transferred to any postsecondary institution in the state that is part of the articulation agreement.

Furthermore, states perceived professional development, lack of assessment, minimal staff time, and confusion with terminology as obstacles to developing POS. In contrast, partnerships (e.g., advisory board, business and industry, and instructors), marketing (i.e., connecting POS to larger programs, agendas, and funds), national models and templates for replication (e.g., Career Clusters), and patience with the process were indicated as factors that supported implementation (NASDCTEc, 2007).

The NRCCTE's research on POS also identified factors (both contributors and inhibitors) that can affect POS (Alfeld, 2010):

- Direction of initiative (i.e., colleges reaching out to high schools)
- Advisory committees (with members from secondary, postsecondary, and industry)
- Career guidance
- Logistics of dual credit
- Costs and benefits (e.g., colleges covering cost of tuition, receiving more state funding for their increased enrollments)
- Dedicated staff
- Curriculum integration
- Smaller communities with less bureaucracy
- Theory versus practice of POS

Method

The NRCCTE and OVAE requested a comparative case study of participating and nonparticipating states in the NRCCTE's TA. The following questions guided the study:

1. What value does the TA add in the context of POS in the five participating states in comparison with those applicants that did not receive TA services?
2. Is the TA facilitator model a good model for change? Can significant change attributable to TA be identified?
3. How can the TA be improved?

A multiple holistic case-study design was employed to answer these questions (Yin, 2009). The assumption was that if TA has been worthwhile, then participating states should be ahead of other states in developing and implementing green-focused POS. The design is a multiple case study because POS development and implementation were considered for (a) five participating and (b) five nonparticipating states in TA. It is also holistic in that the global nature of POS development and implementation was explored, rather than a sample of all embedded units within each state's larger POS development and implementation activities (Yin, 2009). Multiple sources of information and evidence including semi-structured interviews, existing case studies (e.g., Shumer, 2010), source documents, archival records, and websites were used to investigate the focal research questions. Using this method, data for single cases (states) were first examined to identify consistent patterns and themes within cases. Then, a cross-case analysis was used to determine which patterns were consistent or inconsistent across participating and nonparticipating states. Finally, findings were synthesized across participating and nonparticipating states (Miles & Huberman, 1994; Yin, 2009). The logic of the design is displayed in Figure 1.

The following sections provide an overview of (a) state selection, (b) respondent selection and recruitment, (c) data collection, and (d) data analysis and reporting.

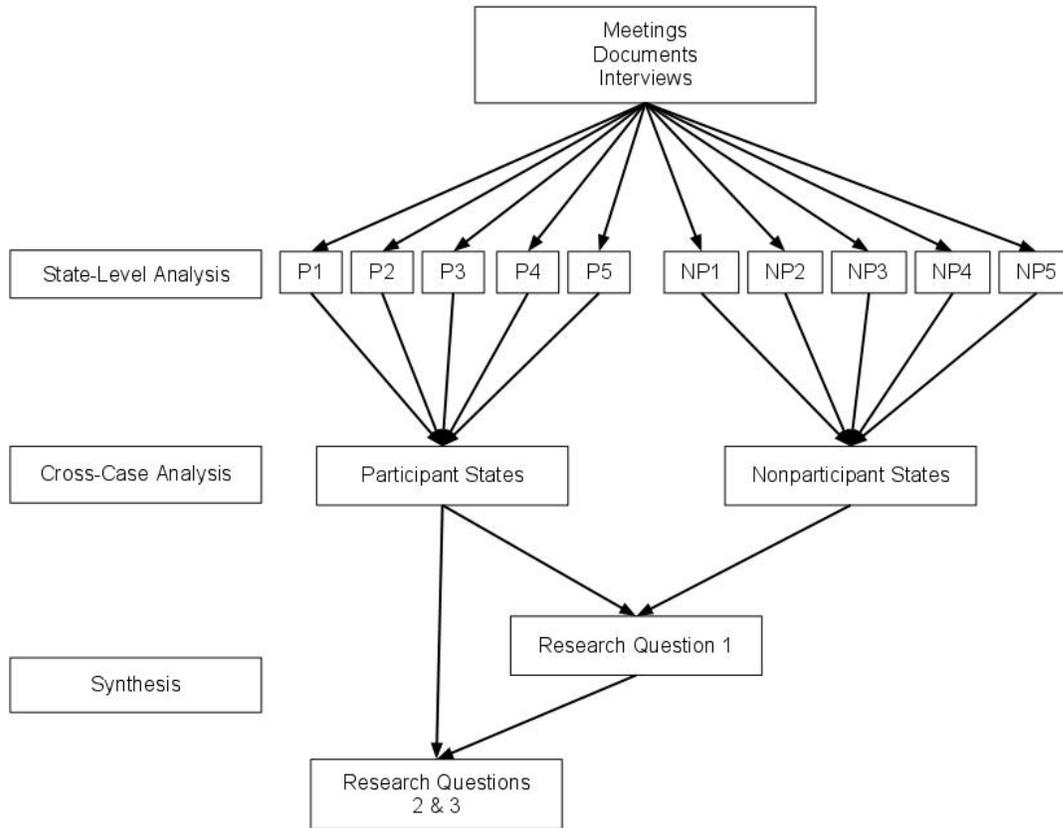


FIGURE 1. Study logic and sequencing.

State Selection: Matching Participating and Nonparticipating States

As indicated in the project summary, 18 states submitted proposals to participate in the NRCCTE’s TA. From these, 5 were selected: Georgia, Illinois, New Jersey, Ohio, and Oregon. A matched sample of 5 states from the 13 states that applied but did not receive TA support was selected for comparison based on recommendations from OVAE and the NRCCTE as well as key characteristics of nonparticipating states, including:

- Geographic location
- Population
- Primary industry
- Local control (bottom-up) versus state control (top-down)
- Process drivers (i.e., government, secondary or postsecondary education, or industry)
- Percentage of students not completing high school

Based on the selection and matching criteria, Georgia was matched with Kentucky and Illinois was matched with Michigan. These matched states share similar geographic locations and are locally controlled. New Jersey was matched with Pennsylvania, the only Eastern state close to

New Jersey in terms of population, high school dropout rates, and primary businesses. Ohio was matched with Minnesota based on recommendations from OVAE and the NRCCTE. Finally, California was matched with Oregon because it was the only non-participating applicant located in the West.

Subject Recruitment

In participating states, key informants consulted about POS development and implementation included facilitators, state leaders, team members, and implementation site members of participating states. In non-participating states, key informants consulted about progress without TA from the NRCCTE were team members from the application to participate. The list of state team members was gathered from NRCCTE documents (i.e., the TA applications and reports from participating states). The list of facilitators was provided by the NRCCTE. Other key informants were identified during interviews. As an initial step to recruiting participants, the NRCCTE Director, Dr. James R. Stone III, sent a letter requesting participation in the study from all individuals who were on the contact list. A list of bounced emails was then sent to the evaluation team. These people were removed from the contact list.

The evaluation team selected all facilitators, all state leaders, and a random sample of 10 members or site partners from each state for interviewing. If a state had fewer than 10 members or site partners, all were invited to participate. An initial email was sent out inviting those selected to participate in a telephone interview. Again, any contacts whose emails bounced were removed from the list and replaced with new, randomly selected invitees. Additionally, the evaluation team did not interview any contacts who had changed jobs and were no longer involved in state POS. Reminder emails were sent to those who did not reply after one week. A second phase of invitations was sent to members who were recommended by respondents and to additional members on the contact list if the response rate was low from the first round of invitations. If interviewing a contact was very important (e.g., state facilitators, leaders, or reportedly “essential” members), follow-up phone calls were made to schedule interviews. A profile of the resulting set of respondents is displayed in Table 1.

Data Collection

Data collection included document reviews and telephone interviews with facilitators, state leaders, team members, and staff at implementation sites in participating states, as well as interviews with team members (those identified in the original application) in nonparticipating states.

Document review. Documents reviewed included those available from the project and on the NRCCTE’s website (e.g., state applications and evaluations, action plans, and project summaries), the pertinent literature, and studies conducted by NASDCTEc (2007) and Shumer (2010). Based on these documents, draft background reports were developed for each state to aid in the interview process.³

³ The draft background reports are available upon request from the authors.

Table 1
Contacts and Interviewees by State

State	Potential Contacts	Total Invited for Interviews	Contacts Without Information	Facilitators Interviewed	Leaders Interviewed	Members Interviewed	Implementation Sites Interviewed	Total Interviewed
GA	37	15	0	1	1	5	0	7
IL	19	17	0	1	1	8	0	10
NJ	43	18	0	1	1	6	0	8
OH	20	14	3	1	1	4	0	6
OR	17	17	2	1	1	3	0	5
CA	17	17	2	0	0	5	0	5
KY	9	9	2	0	0	1	1	2
MI	7	7	1	0	0	3	0	3
MN	13	13	2	0	0	5	1	6
PA	7	7	0	0	0	3	1	4
Total	189	134	12	5	5	43	3	56

Interviews. Semi-structured recorded telephone interviews were conducted between May 23, 2011 and June 17, 2011. Interviews with facilitators took approximately 60 minutes and focused on questions about how the TA was implemented and perceptions of progress made in the respective states, as well as the challenges and opportunities encountered. Interviews with state team leaders lasted approximately 60 minutes and included questions about the process and progress in developing and implementing green-focused POS within given states, in addition to the strengths and weaknesses of the process. State team members were interviewed for approximately 30 minutes each. These individuals were asked general questions about the process and progress made in developing and implementing green-focused POS within their state, in addition to the strengths and weaknesses of the process. In three cases, a combination of the nonparticipant and implementation site protocols was used because respondents indicated a dual role (i.e., a team member who also worked on implementation). The respective instruments can be found in Appendix A. All but the implementation site protocol have five sections:

1. General questions
2. Model development (2009-2010)
3. Development for implementation⁴ (2010-2011)
4. Implementation (2011-2012)
5. Outcomes and impacts

Four researchers conducted the interviews. Interviewers were trained by listening to the first interview, reviewing and discussing strengths and weaknesses of the first interview, and receiving an interview guide and protocols. Interviewers were asked to follow the protocol and ask follow-up questions as needed. After completing the interviews, interviewers were asked to

⁴ Development for implementation consists of curricula, materials, resources, course sequences, articulation agreements, local planning for implementation, and staff development.

send their audio files to the coordinator responsible for processing and distributing files for transcription. Interviewers were instructed to remove the audio files from their personal devices after the receipt and functionality of the audio files were confirmed.

Data Processing and Analysis

Data processing and analysis included transcription, coding, state-level analysis, cross-case analysis, and final synthesis.

Transcription. Transcription began on May 24, 2011, and ended on July 13, 2011. The eight transcribers received a brief training and templates for transcription that were based on the respective interview protocols. Transcribers were asked to return completed transcripts to the coordinator and remove audio files and transcripts from their computers once receipt and accuracy were confirmed. The coordinator reviewed the quality of transcripts. Poor quality transcripts were corrected. Two interviews were not transcribed; one had insufficient information to merit transcription, and the other had poor audio quality.

Coding. All transcripts were coded in MaxQDA10+. As an initial step in the coding process, five interviews were randomly selected to use in developing and testing a coding manual. The coding manual included 50 codes that corresponded to the interview protocol. Codes were grouped into five primary categories: (a) general textual information, (b) model development, (c) development for implementation, (d) implementation, and (e) impact.

Two of the three coders coded each of the five documents (consisting of one facilitator, one lead, and three member interviews). Inter-coder agreement was calculated in MaxQDA10+ using the “code existence in document” metric, which determines the variation in the presence of each code in a document for two coders coding the same document with the same set of codes. This “code existence in document” metric was chosen due to the large number of codes applied. Inter-coder agreement for the initial five interviews ranged from 0.76 to 0.85, and averaged 0.81, roughly corresponding to a rate of 81% agreement across coded units.

Three different coders were used to code the remaining 54 interviews using the coding manual. Coders were trained in the use of the coding manual and received a set of transcripts presenting each type of interview (i.e., participating state leader, member, facilitator, nonparticipating state member). They independently coded five of the remaining interviews and then cross-validated their coding by reviewing each other’s coding strategies in order to calibrate across coders. Inter-coder agreement for pairs of coders ranged from 0.65 to 0.90. Average agreement for each coding pair ranged from 0.76 to 0.81.

Lower instances of agreement appeared to be driven by differences in coding styles. Two coders initially chose to code more specifically (i.e., at the sentence or phrase level), whereas one identified codes more generally at a paragraph level. Discussions between the coders after the initial coding of five interviews led to an agreement to code more specifically in the remaining interviews. The coders then individually coded the remaining interviews, with each coder completing approximately 16 additional interviews.

Across all 10 interviews, the average intercoder agreement was 0.80. For the five participating states in the sample, the average intercoder agreement was 0.77, and for the four nonparticipating states, where interviews were generally shorter and therefore specific codes were less likely to be applicable, it was 0.83. Overall, the level of intercoder agreement achieved for the sample was deemed satisfactory for the case study methodology. Because some calibration occurred after the initial coding, it is believed that these percentages actually underestimate the true intercoder agreement for the study, as calculated using the “code existence in document” metric.

The remaining interviews were then assigned to individual coders using a stratified random sampling design. This helped ensure that no type of interview would be entirely coded by the same person.

State-level analysis. Six individuals were provided with a brief training, coding segments from MaxQDA10+, the transcripts, and a sample case report from a participating state. Each was asked to conduct coding for data from and report on assigned, individual states, corresponding to themes identified in the example case. Pattern-matching techniques were used to analyze the data. Each state-level report was reviewed for accuracy and completeness. The resulting state-level case studies are included in Appendices B and C.

Cross-case analysis. Cross-case analyses were conducted for participating and nonparticipating states. A team of four individuals completed the cross-case analyses for participating states. A team of three individuals completed the cross-case analyses for nonparticipating states. Before beginning the analysis, the teams conducted a final review of the state-level case studies.

Synthesis. The final synthesis involved a comparison between participating and nonparticipating states based on the cross-case reports. Of special interest for the final synthesis were the three research questions that guided the study.

Quality Control and Limitations

Because data collection could not begin until the end of May, the study faced several problems, commonly referred to as a *method effect*. The limitations included, but are not limited to, the following:

- ***Response rates.*** The abbreviated time for data collection reduced the number of respondents who could be reached. A larger response rate would probably have provided more robust findings.
- ***No feedback from key informants.*** Feedback and verification (i.e., member checks) on the state-level case studies from key informants (i.e., facilitators and state leaders) could not be obtained at the time of the report. With additional time and resources, this feedback could be obtained.

Moreover, this case study is an exploratory study rather than an explanatory study. Future studies on TA within the context of POS development and implementation could build on this study by using instruments and findings to develop a more closed study that could be used to explain

cause and effect more fully. Such a study could be designed at the beginning of a new project to allow for experimental controls.

Nevertheless, the quality of the study was maximized within given limitations. Some of the strategies used to mitigate the limitations and maximize the quality of the study were:

- **Minimization of researcher effects.** The researcher effect on each case was limited for the following reasons. First, the researchers' effect on the sites was reduced, because the researchers are external to the funders (OVAE), NRCCTE, AED, and the states. As a result, respondents could be truthful in their assessments of the facilitator model. Moreover, researchers were neither a threat nor a disruption to the environments under investigation because unobtrusive telephone interviews were used rather than extensive site visits. Interviewees also were aware of the purpose and context of the study.

Second, the effect of the cases on the researchers was minimal. Interviewees not only included "elite" respondents (i.e., state leaders and NRCCTE facilitators), but also "average" team members who were located at the periphery of the project. Moreover, interviewers and coders were randomly assigned to help eliminate any biases toward one state. Researchers also employed triangulation techniques and cross-validated analyses and interpretations throughout the course of the study.

- **Triangulation.** The study employed data and methodological triangulation (Patton, 2002). In essence, findings were triangulated based on data from different respondent groups and characteristics (e.g., facilitators, state leaders, team members, and implementation site staff) and different data collection methods (e.g., document reviews and interviews).
- **Weighting.** Interviewers and data analysts gave more emphasis to responses from facilitators and state leaders who were at the heart of the TA, had more extensive knowledge about the TA, and had most of the responsibility associated with developing and implementing POS. To the extent possible, interviewers followed up regarding key issues that arose in a given state by asking additional questions, contacting key people who were identified, and interviewing them. Data analysts were aware of the different roles of respondents so that perceptions of members with little involvement would not outweigh those of individuals who were more extensively involved.

Results

In the following sections, the results from the cross-case analyses for participating and nonparticipating states are presented, followed by the final synthesis and reflection on the three key research questions. The findings indicate specific states. These references to specific states do not mean that other states have not had similar experiences.

Findings from the Cross-Case Analysis of Participating States

Interviews were conducted with each of the five participating states' facilitators (5), team leaders (5), and team members (25), including representatives from secondary education, postsecondary education, industry, the state department of education, and other education organizations.

Background and Contexts

The following paragraphs summarize contextual information across participating states.

Reasons for participating. Interviewees from all states reported that the opportunity to continue existing work on POS and the green focus of the TA were the two main reasons for their states' participation. Other reasons for participating cited by interviewees include:

- Wanting to create more POS (Illinois).
- Wanting to create or improve upon existing POS models (Georgia, Ohio, Oregon).
- Wanting diverse POS within the state (Illinois).
- Improving collaboration between secondary and postsecondary (Illinois, Ohio).
- Creating more articulation agreements (Illinois).
- Creating career pathways for students (Illinois, Ohio).
- Helping the state “go green” more quickly (Georgia).

Prior experience. Most interviewees from all five states indicated experience with POS, movements similar to POS, or both. Interviewees from Georgia, Illinois, and Ohio reported experience with POS, but not green POS. In addition, interviewees from Illinois and Oregon reported that many of the team members knew each other before coming together for the TA project.

The team. The state teams had from 10 to 50 members. All teams included members from secondary and postsecondary education, state government, and interested “green” businesses. Interview participants described teams as “diverse,” “well-balanced,” “comprehensive,” and “encompassing.” Additionally, most state teams were described as filled with “powerful” and “prominent” individuals.

Technical Assistance

The NRCCTE TA varied by state. Nevertheless, common themes emerged in interviewees' descriptions of the TA. Summaries of the specific channels for the TA, facilitator roles, team perceptions of the TA, additional sources of assistance, and the degree to which the TA objectives were met are presented below.

Channels for TA. In most cases, participating states had two main channels for assistance: (a) national meetings such as the TAA in Washington, DC, and the Career Clusters Institute in Denver and (b) in-state team meetings with the facilitator and any additional outside experts, as needed. Typically, only a few in-state team meetings were held, but in New Jersey, additional pathway advisory committee meetings also took place. In Georgia, the facilitator took the unique step of establishing a POS blog to provide another avenue for assistance to the team.

Role of the facilitator. Facilitators served in key roles at both the national and in-state meetings. Team members mentioned that their state facilitators performed the following tasks:

- Facilitating meetings
- Providing additional information and bringing in experts
- Keeping members on task and moving forward to reach goals
- Restructuring the team as needed to address specific needs
- Providing feedback
- Making sure that all members had opportunities to contribute
- Facilitating implementation

Some team members were unsure of their facilitators' roles. In Oregon, some members mentioned that the facilitator was not always present at state team meetings and that communication between the facilitator and team members was minimal. Some members from Illinois reported that the TAA provided the only assistance they received.

Team perceptions. Team members in all participating states reported that the TA was beneficial and helped them make progress in developing a green-focused POS. Team members in Illinois particularly stressed the value of the TAA. Individuals thought that this conference provided them with the necessary background information, helped them understand the expectations for developing POS, and gave them the guidance and motivation required to move forward as a team.

Most members saw their facilitators as an invaluable part of the process. Facilitators were described as being “fantastic,” “useful,” “productive,” and “very beneficial” to the work of the team. Aspects of the facilitation that were noted as being particularly useful included keeping the team on task, providing direction for the work, helping them understand the process, and providing a wide range of knowledge and points of view.

Some team members from Georgia, Oregon, and Illinois questioned the quality of the TA they received. Some thought that they did not receive any assistance, and others said that the facilitator fell short of their expectations.

Additional assistance. Interviewees from Georgia, Illinois, and Oregon indicated that their teams received assistance in addition to the NRCCTE TA project. This additional assistance included (a) supplementary funding from the state, universities, schools, or businesses to implement initiatives, (b) guidance and support from industry experts, and (c) resources and training through other CTE initiatives (e.g., Career Clusters, Race to the Top). Additionally, team members were willing to donate their own time, expertise, and effort to the project.

TA objectives. Achievement of TA objectives varied within the participating states. Objectives are listed below in order of frequency. Interviewees in many or all states experienced achievements that appear higher on the list; whereas interviewees in fewer states experienced objectives that appear lower on the list.

- ***Increased understanding of the POS framework:*** Members of every state team suggested that this objective was met to a high degree. Respondents seemed to agree that the TA was particularly useful in helping them clarify their understanding of how the national framework compared with state frameworks, and that the TA helped indicate the next steps in furthering the development of POS within the state.
- ***Increased understanding of the roles and responsibilities of different sectors:*** Members from every state reported increased understanding of the roles and responsibilities of different sectors in how they relate to CTE. This likely was accomplished through the many meetings that were held, which resulted in overall improved communication and cooperation between team members. Interviewees from Illinois suggested that the facilitator was particularly helpful in establishing a forum for members to discuss and clarify their roles and responsibilities.
- ***Provided green-focused information:*** Members from all states, except New Jersey, agreed that some information was provided about green-focused industries and programs. In Georgia, this came from simply having a large, diverse team. Members in New Jersey thought that not enough of this information was provided; they were looking for more green-focused expertise. Members in Oregon, on the other hand, thought that they already had more than enough information and did not need any additional resources from the facilitator.
- ***Addressed barriers and obstacles to student participation:*** Members from Georgia, Illinois, and Oregon reported that the TA helped address barriers and obstacles to student participation in POS. Simply developing articulation agreements was one step toward removing some of these obstacles. Additional barriers may have been removed by improving the communication between the secondary and postsecondary educational institutions and better integrating the different stages of the POS models.
- ***Provided tools and strategies for states:*** Members from Ohio and Georgia indicated that they received some tools or strategies to help with the process of developing green-focused POS, but team members in other states indicated that this objective was met only partially or not at all. One of the strategies mentioned by interviewees in Georgia involved presenting other states' experiences in developing articulation agreements. Another strategy was the facilitators' assistance in "identifying what these tools and strategies might be." Interviewees from Oregon mentioned that teams were left to create their own strategies. Some members in New Jersey thought that they were not provided with enough assistance in this area and wanted more specific guidance on the POS development process.

Programs of Study

Despite the geographic and political differences among states that received the NRCCTE TA, the states' POS shared a number of features. They were all locally developed, approved by state education administrators, and deployed in a limited context by a small number of cooperating secondary and postsecondary institutions and industry partners. Most often, the postsecondary

institutions were two-year or community colleges; a minority of interviewees cited separate articulation agreements between two-year and four-year postsecondary institutions, particularly in fields like engineering. States were universally aware of and willing to participate in requirements for receiving funding under Perkins IV.

State experiences with green-focused POS developed with TA closely resembled one another and were almost universally positive. The underlying Perkins requirements for POS appear to have generated similar administrative structures and similar experiences from state to state. From that foundation, and despite the diverse makeup of the state groups with which they worked, the facilitators appear to have inspired largely similar efforts from their groups.

Differences from prior efforts. Two substantial differences between prior approaches and those adopted for the duration of the TA were evident. First, whereas the green-focused POS that were developed under the guidance of the NRCCTE were intended to be deployed on a statewide basis, no state had previously developed a statewide POS for implementation. Prior to the TA, POS were largely locally driven, developed, and deployed. Nevertheless, the efforts put forth by the states generally seem likely to succeed due to apparent buy-in from many institutions, probably due to wide participation in TA meetings.

Second, in prior efforts, industry often had not been a direct partner in the development of POS. Even in cases in which industry representatives advised or consulted on individual (i.e., local) POS, they seldom participated in planning. Essentially, the needs of industry were considered more fully in the TA process than they had been before. Interviewees generally appeared pleased with the larger role of industry in developing green-focused POS and believed it would be an additional advantage for students involved in the POS.

Third, the process of developing green-focused POS was also different. Interviewees from each state cited the role of the facilitator as integral to the process. Two aspects of facilitation were frequently mentioned: The state facilitators provided focus to development meetings and brought a valuable and knowledgeable external perspective to the process.

The TA process in general was frequently described as more thorough and more focused than any training the interviewees had previously received. Developing the green-focused POS was similarly described as much more straightforward and involving much better communication than similar processes that had previously taken place without a facilitator.

However, one of the few negative comments emerged from this aspect of TA in Georgia:

It was a messy process. It became a, “How do we make articulation work better in the state?” process, which is not something we really wanted help on. That is a more internal thing, a much more internal thing.

Minimum standards for POS. Most state teams were aware of the OVAE standards (OVAE, 2010) and thought their green-focused POS satisfied all the OVAE requirements. However, it was common for states to have individual frameworks or guidelines for POS before the TA process began, and interviewees frequently noted that the facilitators and TA process allowed

them to align and adapt their existing work to the OVAE standards. State leaders and other participants particularly commented on the OVAE standards:

- Every state incorporated ***alignment between secondary and postsecondary education***. Interviewees used terms like “prerequisite” and “requirement” to describe this aspect of POS; one interviewee referred to creating a “seamless” transition from the 12th grade to the 13th.
- Each state includes ***academic and CTE content in a coordinated, non-duplicative progression of courses***. New Jersey called this “developing.” Each state in the sample was aware of the need and was at least attempting to address it.
- Except for Georgia, all states had existing ***opportunities for secondary students to acquire postsecondary credits*** when appropriate. However, in this area, compliance with OVAE standards (OVAE, 2010) differed most among states. For example, Illinois had recently invested in a new data system, which helped the state address dual-enrollment agreements thoroughly and systematically, whereas New Jersey was setting up an organized apprenticeship program for secondary students that ideally would allow students to acquire some work experience in the intended field while simultaneously gaining college credit. Georgia, however, had significant legislative and policy impediments to dual enrollment, particularly including preexisting policy that made funding dual-enrollment courses problematic.
- Each state was working on ***POS leading to an industry-recognized credential or certificate at the postsecondary level or an associate or baccalaureate degree***. States varied somewhat on this point, particularly between those that had certification programs already in place and those that were developing them, but, again, each state was at least aware of the requirement and attempting to meet it.

Model Development and Implementation

Similarities and differences in POS model development and implementation are discussed in the following sections.

Timing. During the first year of model development, states worked to complete an initial model. All states reported developing at least an initial draft by the end of 2010-2011. However, they continued to refine their models during the subsequent year.

Model development process (2009-2010). Different state teams approached the model development process differently. In Oregon, Georgia, and Illinois, a single group handled POS development. In New Jersey and Ohio, the initial group broke into three subgroups to develop individual POS for different disciplines. In New Jersey, it was noted that the facilitator focused more attention on specific subgroups, but in Ohio there was no mention of the subgroups as a hindrance to the facilitator.

One area of discrepancy among participating states was in the level of preparation before beginning the model development process. Although all states claimed that model development started in late 2009, many commented on their previous level of experience in developing POS and in green areas. An interviewee in Georgia said the group felt confident of their progress until the facilitator arrived, and then, with the facilitator's help, realized that a significant amount of work remained. An interviewee in New Jersey thought that jumping into developing a green POS was necessary because they would never fully be prepared: "We took a flying leap on this and said if we wait until we have everything in place before we start this, we are never going to start it. It is very stressful, but in the end, I think that is the way things work, the way things get done. We really took on a lot." In Oregon, at least one interviewee still perceived a need for help with how to develop a statewide POS.

The role of government. State governments all acted primarily as funding and approval or quality control bodies. The phrase "bottom-up" was used to describe almost every state process, with state administrators functioning as a top-level check on locally or regionally developed POS. Specifically, interviewees in New Jersey, Georgia, and Oregon described their model development processes as "bottom-up," whereas interviewees in Illinois and Ohio said their processes were a combination of both "bottom-up" and "top-down." However, at least one individual from Oregon noted a belief that "it would not have happened had the state not been involved." People in the states that were described as "bottom-up" and "top-down" had similar experiences: The states provided guidelines for the creation of POS, but local institutions drove the actual inclusion of courses for the curricula and implementation of the developed POS. In Georgia, the state government recently changed a law restricting funding for dual enrollment programs. This policy impact occurred almost concurrently with recent federal changes to Perkins (Perkins IV) and was perceived as positive by interviewees.

Addressing local needs. POS generally address local needs due to the bottom-up nature of the POS development process. One interviewee's statement provided an approximate summary of many comments relating to local needs: "[local institutions] can basically do whatever they want." Interviewees appeared to think, however, that the statewide nature of the green-focused POS developed with the TA was a positive development. This was due at least in part to the difficulty and complexity at the state level of approving and aligning multiple similar POS among districts or regions.

Self-assessment. The self-assessment tool (MPR Associates, Inc., 2010) was used in all participating states, but interviewees' opinions varied regarding its usefulness, largely depending on how the tool was utilized in that state's process. In New Jersey, the self-assessment tool had been used repeatedly; but in all other states, the self-assessment tool was used only once, near the beginning of the development process. In Georgia, New Jersey, and Oregon, the self-assessment was conducted as a group and subsequently discussed as a group. This proved particularly beneficial in Georgia, where the self-assessment highlighted communication issues that were then addressed by the facilitator.

Interviewees in Ohio and New Jersey described more negative experiences with the self-assessment process. In Ohio, at least one interviewee reported that the self-assessment tool was "awkward." However, in this case, it did highlight communication issues in that it was reportedly

“difficult to respond to as a group because local educators would respond differently to the questions than state level educators.” In Illinois, individuals conducted the self-assessment before the first development meeting and then regretted that decision, because some team members were not involved in the process. One Illinois interviewee recommended that “the self-assessment piece [should] be conducted differently during the next iteration of the process.” In general, the self-assessment tool had value in identifying communication issues. Moreover, the value of the tool appeared to increase in direct proportion to the number of team members who were able to participate in the self-assessment process. However, the only reported benefits of using the tool were highlighting communication issues and providing a mechanism to facilitate better communication.

Development for implementation (2010-2011). Interviewees from all five states reported that the 2010-2011 year was spent finishing the POS model and developing an implementation strategy. Although all states still reported that they were on track for implementation in the fall, interviewees in Georgia and Oregon indicated that they were slowed down during the 2010-2011 year. In Georgia, some interviewees specifically pointed out that turnover in state leadership created a bottleneck in the process. Interviewees in Oregon cited “economic issues” within the state and a lack of clarity as to whether TA was available. Ultimately, several Oregon team members thought that the minimal TA received during this time slowed the team down.

2010-2011 goals. Each state’s team efforts for 2010-2011 were focused on finalizing the POS model and developing an implementation strategy. Specific goals mentioned by interviewees included “developing core content,” “looking at curriculum offerings at the community college,” and identifying and setting “standards.”

Items developed. Respondents in Georgia and Ohio reported working to put an articulation agreement in place. Alignment between curriculum and industry needs was also a 2010-2011 topic for interviewees in Georgia, Ohio, and New Jersey. In Illinois and Oregon, participants described creating a website and developing materials including assessment tools.

Interviewees in New Jersey, Georgia, and Oregon discussed the importance of stakeholder involvement in either the development or implementation stages. Although most cited stakeholders as engaged at the model development stage, an interviewee in New Jersey noted that stakeholder feedback was sought during development for implementation instead.

2011-2012 plans. In all five states, the primary goal for 2011-2012 was to move forward with implementation. For example, in Ohio, the plan was to “take the work... to teachers, so that the new standards can be integrated into the curriculum for the next school year.” Most interviewees discussed implementation in general terms, making it difficult to ascertain the breadth of implementation, but in New Jersey, the POS was being implemented as a pilot in six schools. Because Georgia and Oregon had trouble fitting a statewide model into their context, implementation in those states seemed likely to follow a similar model of small, local pilots. At least one individual from every state except New Jersey specifically mentioned intent to implement the model statewide or to use the model to develop additional POS.

In addition to leveraging the model to develop additional POS, plans for the year ahead and beyond include improving existing POS, broadening involvement to include four-year institutions, and providing professional development opportunities. In Oregon and Ohio, interviewees expressed a desire to engage four-year institutions to try to expand the POS through Grade 16. New Jersey, Ohio, and Oregon interviewees said they were planning professional development for teachers to train them in implementing the new POS.

Enablers

Interviewees identified seven elements that contributed to model development and implementation. Interviewees in more than one state independently mentioned each of four elements, whereas the remaining three elements were specific to the experience of particular states. Whether an element emerged in any given state is limited by the responses to interview questions with the participating interviewees in that state. The failure to mention an element does not necessarily imply that the element was not helpful in a given state. Instead, the absence of an element in interviews from a state likely suggests that it was less important there and therefore was not mentioned as frequently in interviews. Similarities and differences in the enablers are presented below.

Similarities. Four elements were mentioned by interviewees in more than one state. They are likely important in enabling model development and implementation for the project in general.

- ***The facilitator:*** The facilitator was mentioned by interviewees from all participating states as an important contributor to model development and implementation. The facilitator's role in enhancing communication and bringing expertise to the table helped earn the respect of participants, who frequently labeled facilitators as "useful," "knowledgeable," and "a key element."

Representatives from Georgia and Oregon highlighted the importance of an "outside perspective" throughout the project. In Georgia, "having an outsider kept everybody at the table even when the discussions were a little bit rocky."

Finally, in all states except Illinois, interviewees highlighted the role the facilitator played in organization and "keeping the project on track." The perceived positive value of the facilitator, combined with the time and budget limitations of the project, may have helped keep teams moving forward to make the best use of the facilitator. In many states, the facilitator's actions reportedly helped to speed up the process. For example, in Ohio, the facilitator was perceived to fill in when interviewees thought leadership was absent. In New Jersey, the presence of a facilitator helped in "getting people to produce the deliverables, the outline and the content, and getting consensus on that. [The facilitator] did a lot during the meetings to facilitate those things." Additionally, in Georgia, the facilitator was able to break down communication barriers.

- ***Communication and collaboration with a diverse group:*** Interviewees in Georgia, Illinois, Ohio, and Oregon identified working together as an important enabler. Once communication was established and functional, working together helped team members

share perspectives on topics and issues, which allowed them to see the bigger picture. One interviewee from Illinois said that because of the team meetings, “We were able to come out with an understanding that POS in manufacturing could have a green focus, because it was about energy, and it was about alternative energy, and it was about understanding what a smart grid is.” In Ohio, the interaction of a diverse group was found to be helpful. According to one interviewee, “We had the secondary, the postsecondary, and the [Ohio Department of Education] in the room at the same time and we went through the process. That was real valuable.” Finally, an interviewee from Oregon noted that it was beneficial to have “the right people at the table and be able to have good solid discussions about what the program of study was, educating others that were not very familiar with what a program of study really is.”

- ***The TAA in Washington, DC:*** In Georgia, Illinois, and Ohio, the TAA was described as an enabler to the model development process. Specifically, individuals in these states valued the “guidance they received from experts” and the “team-building” that occurred because of the teams spending time together in Washington, DC.
- ***Industry and green expertise:*** In New Jersey, Illinois, and Oregon, interviewees commented on the importance of including industry and green experts in their projects. In Georgia, the “inclusion of industry from the beginning of the discussion” was cited as an important step in the model development process.

Differences. Some elements were mentioned by an individual (or individuals) from only one state. Three elements emerged as helpful to model development and implementation in just one state. These elements can be considered less important to enabling model development and implementation for the project in general, but may have been essential in a given state.

- ***Interest and support:*** In Ohio, the broad interest of education and industry in POS and green-focused POS was viewed as having enabled model development and implementation. An interviewee noted, “I think there was a lot of interest. So I think that’s really a big benefit.”
- ***Measurable outcomes:*** In Illinois, an interviewee reported that a “motivating factor was letting the individual participants focus their efforts on producing outcomes that could be measurable.”
- ***The inclusion of local institutions:*** It was mentioned in Georgia that the inclusion of local institutions helped to foster a bottom-up mentality.

Barriers

Many interviewees identified significant barriers to the development process. As in the previous section, barriers were identified thematically based on participants' responses. In contrast to enablers, only one barrier emerged in a single state. That is, the experiences with barriers in each state appear to be very similar, and all barriers but one are therefore characterized as similarities among the state-level case studies. Again, the absence of a theme from interviews from a particular state may not indicate that it did not occur there, but rather that it was of lower priority or that it was not a particular feature of the experience of the team members interviewed.

Barriers are listed below in order of frequency. Interviewees in many or all states mentioned barriers that appear higher on the list. Interviewees in fewer states mentioned barriers that appear lower in the list.

Similarities. The following similarities emerged:

- **Time and resource constraints:** Particularly against the backdrop of the ongoing economic recovery, education budgets are stretched and stressed. This limited the amount of time and effort some states were able to spend reforming the POS process and developing new POS. By participating in the TA, many team members were taking on extra work in addition to already full schedules. Interviewees in every state experienced time and resource constraints.
- **Turnover and staff changes:** Membership of some TA meeting groups changed over the course of the project. In Illinois, change appeared particularly frequent, and in Georgia, turnover included the team leadership. In Ohio, the industry groups sent different representatives to each meeting. This turnover meant more time spent reviewing work already completed with those new to the process, more time spent reintegrating working groups, and correspondingly less time spent on the already compressed TA schedule.
- **Conflicts between local and state authority:** As mentioned in the POS section, local education control was reported in each state. Interviewees in Illinois speculated that institutions without a voice in the development process might resist a statewide plan. Interviewees in Georgia grappled with the change in legislative funding requirements for dual enrollment classes. Oregon has large rural areas with a history of local independence, and interviewees indicated concern that some postsecondary institutions lacked strong or sufficient reporting mechanisms.
- **Coordination and communication:** The TA teams ideally incorporated three groups: representatives from secondary institutions, postsecondary institutions, and local and state industry. Team members in both Georgia and Illinois had some difficulty coordinating agreements among disparate educational institutions due to issues like conflicting policies. Interviewees in Illinois also experienced difficulty negotiating productive partnerships between the education and business sectors and thought that some meetings lacked clear communication about and focus on the green-focused POS.

- ***Working with an emerging industry:*** Because green industries are relatively new, some interviewees saw changes even during the limited period of the TA. Interviewees in Ohio emphasized the challenge of developing a plan that included certification when some green industries have certification requirements that are still in flux, whereas others lack clear certification. Team members in Illinois noted their team initially lacked a complete and shared understanding of what “green” meant in the context of CTE.

Differences. The following differences emerged:

- ***Unresponsive leadership:*** In Ohio, interviewees perceived the leader as overly focused on a particular perspective and agenda. The leader also had been uncommunicative with team members about current developments in the state since the expiration of the TA, which led one interviewee to question whether the team would be able to continue effectively in the implementation phase.

Impacts

All of the participating states reported several important impacts that resulted from the TA. The majority of these effects were positive and expected, but a small number were unintended.

Positive impacts. The following positive impacts were observed.

- ***Better communication and stronger relationships:*** One of the most common effects mentioned by interviewees in all of the participating states was better communication and improved relationships among individuals across the state. Members of organizations that had never worked together before were now systematically engaged in a collaborative effort to improve POS in the state. The TA pushed for much-needed discussions and decisions to take place, while at the same time building a collective unit in which each individual had a voice. The inclusion of a variety of perspectives positively influenced how the teams approached the project. As a result, “a better sense of community for everyone” was established. The relationships between secondary, postsecondary, and other education institutions were strengthened, and strong connections between education and industry were developed. Organizations also saw improved communication and relationships with their state government departments.
- ***Improved awareness and increased support:*** Interviewees in all participating states saw an improved understanding of CTE issues (including POS) that stemmed from improved communication and relationships. They also reported increased awareness and mutual support. These improvements occurred not only for the active members but also for policymakers and industry representatives. Due to the positive awareness of their work on this project, some members were invited by outside agencies and organizations to provide consultation.
- ***Better organization, structure, and efficiency:*** The TA helped all state teams improve the organization and structure of POS and to define processes clearly for students. This improved organization and structure may allow states to better market green-focused

POS and increase enrollment.

- ***Sustainability:*** Many interviewees intended to continue working together to develop POS and other related projects despite the termination of the TA project. Sustainability did appear to be related to the availability of funding. Team members from Illinois mentioned the use of funds from additional sources to help continue working, and members from Georgia noted that it would be difficult to proceed without additional funding. As a whole, team members appeared to be dedicated and willing to continue with statewide efforts.
- ***Perceived gains for the state:*** Team members believed that all participating states benefited from the relationships that were developed and from the products of the collaborative effort. The improved relationships helped the state teams realize that people are receptive to statewide models as long as they are of high quality. Additionally, it was believed that states benefit from staying current with the latest trends in CTE. Eventually, this should improve the educational system for students.
- ***Perceived gains for participating organizations:*** Team members believed that participating organizations also benefit from the relationships and networks that were established. The thought was that this leads to improved marketing for the organizations and an improved ability to move forward with additional initiatives. There was also the notion that organizations will benefit from the creation of a better prepared workforce stemming directly from the POS that are developed.
- ***Leveraging the model:*** Members from all states mentioned that the model used to develop the green-focused POS would likely be used again when developing additional statewide POS and in developing other curricular innovations. This included the use of self-assessment and continuous improvement strategies. It was believed that the green-focused POS would be a model to replicate and that the lessons learned would allow states to move forward with plans for widespread implementation of POS models, particularly with improved state-level articulation.

Negative impacts. The interviewees from participating states mentioned no significant or widespread negative effects—strong evidence that any negative impacts of the TA were minimal or not discernible. Even so, a few interviewees reported having underestimated the amount of work in relation to the time available. Although considered a negative impact by some, this was really more of a barrier to success. No interviewees reported that other areas suffered because of such underestimation.

Unintended impacts. All the unintended impacts of the TA involved the personal relationships established during the TA process. Members from participating states were able to form relationships with those who did similar work within the state and even beyond. In some cases, these relationships led to direct collaboration, peer learning environments, and new directions for work within the teams. The collaborative nature of the project helped increase team members' buy-in, resulting in greater support for the development of green-focused POS, the emergence of

new state leaders, and an increase in feelings of personal satisfaction as a result of contributing to the effort.

Although many team members had not anticipated the scope or direction of the project, they did not see this in a negative light. Interviewees' understanding of what was necessary to coordinate a successful project improved and, overall, team members were pleased by the ways the project progressed despite how it may have differed from their expectations.

Findings from the Cross-Case Analysis of Nonparticipating States

Interviews about each of the five nonparticipating states (i.e., California, Kentucky, Michigan, Minnesota, and Pennsylvania) were conducted with 19 respondents, including two to five interviewees per state. These respondents typically represented educational administration, secondary and postsecondary education, and industry.

Background and Contexts

The following paragraphs summarize contextual information across nonparticipating states.

Reasons for applying. Respondents from all five states described their reasons for applying for the green-focused POS TA. Each desired to improve the consistency and quality of the educational services they were providing to their students. California, Kentucky, Minnesota, and Pennsylvania planned to better help their students meet the needs of emerging green industries within their states. California and Michigan also wanted to improve the alignment of their secondary and postsecondary education components to facilitate articulation agreements and transfer of credits between institutions. Additionally, respondents from several states mentioned wanting to “learn more about green” and to strengthen or update their curricula. All nonparticipating states discussed the desire to gain increased funding beyond federal funds (Perkins IV) for projects that could benefit students.

The team. Four states (i.e., California, Michigan, Minnesota, and Pennsylvania) reported including business and industry partners in their POS development or implementation team. Minnesota indicated that its team was constructed to focus on grant writing and review and did not describe a team that managed either POS in general or green POS specifically. California's partnerships focused on the culinary arts rather than on green industry. In California and Michigan, advisory panels consisted of external consultants and members of regulatory boards and commissions. Across all five states, teams were responsible for grant writing and curriculum generation and review.

Prior experience. California, Kentucky, and Minnesota specifically described prior experiences with developing and implementing POS. California had developed “academies” as part of its alternative or at-risk education system. These academies offered POS designed to provide an alternate route to degree completion beyond academic work. Kentucky described its work on developing at least one POS for each of its career clusters. For each of these three states, development of POS meant working to develop articulation agreements between the community

colleges and secondary institutions within each district. These states reported that they also were working to align their curriculum with the requirements of the Perkins IV legislation.

POS Development and Implementation

POS development. The states' format and process for model development varied. California, Michigan, and Pennsylvania indicated that the initiative for developing a POS came from their state's department of education in response to the Perkins IV legislation. However, in those states, the responsibility for developing the content of the POS rested within individual districts or with leadership at the regional level. The system could thus identify local needs and ways to meet those needs in a manner consistent with Perkins requirements.

Model development for each of the states began by convening committees of representatives from the various stakeholder sectors. However, as Minnesota respondents noted, representatives from each of those sectors may have had different understandings of what a POS was, in general, and specifically what constituted a green-focused POS. Some of the Minnesota stakeholders thought the POS model was intended as a "guidance model," a planning tool for students and their parents. Other stakeholders thought that the POS model was intended to be an "accountability model" through which districts were encouraged to develop POS programs that were tied in with their technical assessments.

Other aspects of model development in the five nonparticipating states involved reviewing and updating curricula, identifying possible articulation agreements between institutions, developing advisory panels, creating education consortia, and learning more about industry partners. Additionally, in California, a "Rapid Response Team" could respond to grant requests and provide TA in a timelier manner than had been possible in the past. Also in California, a community of instructors was formed that could share experiences with POS development to facilitate future POS development. Michigan respondents described the creation of a technical resource guide that provided a consistent framework within which individual districts could develop POS models.

Development for implementation. California described its process of development for implementation, indicating that it was approximately "two years from having a full program implemented." Currently, academies in the state were allowed to develop their own curricula and POS. However, as one individual stated, "If they want funding, they have to get their curriculum approved."

Agencies in Michigan developed 30 non-green and three model POS. To assist with the development process, in 2009, the Michigan Department of Education developed and published a resource guide for creating model POS. The resource guide was pilot tested in a program at Grand Rapids Community College and used three other times with minimal refinement, thus serving as the process for developing model POS. The resource guide ensured that the process was consistent and yielded a unique product for colleges.

Further, the Michigan Department of Education provided TA to secondary schools and colleges developing POS. The Michigan Department of Education also connected the schools and

colleges with agencies implementing similar POS. An advisory panel reviewed all POS and recommended changes to them.

Self-assessment. All states but Minnesota had a self-assessment process in place. This process was typically focused around educational outcomes assessment of students; if students performed adequately, the model was deemed a success. However, none of the states mentioned a formal evaluation of the POS program implementation process.

2010-2011 activities. Initiatives completed during the 2010-2011 year varied by state with the exception of new POS developed and articulation agreements signed. California, Michigan, and Pennsylvania developed new POS including signed articulation agreements between secondary and postsecondary institutions. In addition to completing the new POS, California and Michigan also used advisory groups composed of industry partners to provide guidance with curriculum development and assistance with POS.

All three states also worked on initiatives unique to their state. California strengthened and developed new curricula and implemented technology in classrooms. Michigan increased the number of community colleges with articulated POS, increased the number of POS within each community college, offered courses and preparatory work in secondary education that better prepared students for entering college, and provided entry-level college courses in secondary education. Pennsylvania worked on an evaluation plan.

The activities for 2010-2011 were not specified in the interviews with representatives from Kentucky and Minnesota.

2011-2012 planned activities. Only one state, California, has plans to start new POS and to expand articulation agreements on existing POS. This is probably because legislation was in place mandating such an increase. However, some leaders in the state expressed doubts about expansion, due to budgetary constraints.

The other states' interviewees spoke primarily about evaluating and improving existing POS. For example, Michigan was planning to evaluate whether it was better to increase the number of POS or add to the curricula (e.g., Year 2, Year 3, etc.) of their existing POS.

Finally, all states were planning some sort of professional development to train educators so that they could achieve the objectives of POS more effectively. As one interviewee said:

Our plan is to continue; we've already set up five meeting dates for next year with our PLC [professional learning community] and working with our business and industry partners to develop professional development opportunities and trainings. I know a number of the teachers wanted to have professional development on how to use the technology better, in other words blogs and things of that nature.

Model implementation. Outside California, none of the states' interviewees conveyed the process for implementing POS. One of the participants described POS implementation:

Okay, so that is curriculum... you'd start with Intro to Energy, and then the additional courses you might also include Energy Auditing in that if you have the time. Intro to Energy, however, could easily take two years, you might then go to Energy Auditing because that may take a quarter of a semester, and then the Green Construction and Intro to Alternative Fuels could easily take two years there. So the POS, all of them start with Intro to Energy, and then you branch off into which area of concentration in which you want to go.

Another individual described implementation:

They have to follow the format and they have to show us, not with just course names, but content, how this is a sequence of courses that builds upon each other and leads to postsecondary education and employment opportunity. So, and then we analyze them every year, they have to provide for us every October an annual report that is very detailed. It includes program reporting which includes the POS in addition to everything else, and it provides for us student performance indicators to show us their students are improving; they are not paid if their students do not meet specific performance measures.

A third member indicated:

They do have science teachers that understand the impact of green and not-green on our environment, so we will put together recommended programs of study. We will make recommendations for how they can get themselves trained, or locate postsecondary teachers to work with or programs to work with, and they will get extra points for following our recommendation. Therefore, it is local control, but we can control what we give points for. You know, as a teacher you have an unlimited amount of extra credit points.

Another respondent stated, "If you go up to cteonline.org, you will see that sort of a collecting point for these types of documents [curriculum] etc. for schools in California."

Status of POS

Description of POS. Only one state, California, has anything resembling a green-focused POS, described by an interviewee as a "green academy." It is not certain to what degree it is like the green-focused POS being encouraged by the NRCCTE's TA. Still, all of the states seem to have had significant experience with POS in general; that is, they had articulation agreements in place between secondary and postsecondary schools with curricula designed to provide technical and vocational training and subsequent certification.

OVAE standards. Officials in California and Minnesota spoke to the POS standards delineated by OVAE (OVAE, 2010). Given their responses, the nonparticipating states indeed seemed to

meet minimum standards for developing and implementing POS. Respondents specifically mentioned standards, including developing solid articulation agreements between secondary and postsecondary schools, adhering to a coordinated sequence of courses in curriculum development, and giving students the opportunity to earn postsecondary credit, certification, or both. Assistance in POS development and implementation was available along the way. One educational administrator stated:

So from our level at the state level, we are giving [local consortia] guidelines, giving them implementation suggestions, working with them, we provide assistance to them as far as developing their programs of study.

Professional development also seemed high on the list of priorities in these states. According to one interviewee:

We have actually dedicated funds for a local [consortium] leader. We have paid 60% of her salary the last three years and she has been working with the local consortia leaders. She actually goes to their sessions and does professional development.

POS differences. It is difficult to ascertain from the interviews whether the application process to the NRCCTE's TA had any effect on those states that were ultimately not chosen to participate. At a minimum, it appears that California may have added green-focused partnership academies because of the experience.

It is clearer that Michigan had a positive response to the application process, yielding an improvement in the articulation process and a recommitment to POS standards. As one interviewee stated:

We are going to try to do some work... with a group of career technical institute leaders to see what we can move forward with using the POS pillar model.... We are looking at the 10 pillars, we are looking at what do we already have in place that lines up with that, and what do we need to expand.

Role of the government in addressing local needs. All of the state governments had significant involvement in the POS process, but no state used an absolute "top-down" approach. In general, state governments were primarily concerned with POS development, whereas local school districts were primarily concerned with POS implementation. Usually, POS models were developed by the state in a way that allowed local districts the flexibility to adjust according to local needs.

- Minnesota appeared to do a good job of addressing local needs. Because POS were developed in a "bottom-up" fashion by local or regional consortia, the resulting programs tended to reflect strongly the preferences of industry and needs of students.
- In Pennsylvania, local needs were addressed because the specific course sequences were developed at the local level. People at the state and the implementation sites interacted

through site visits to 10% to 15% of the districts yearly, two annual conferences, and evaluation efforts.

- In Michigan, determination of local needs remained at the local level. State-level advisory groups provided guidance in the development process, but the local colleges, businesses, and industries determined which POS to design and offer.

Whereas state organizations developed guidelines and monitored adherence to those guidelines, local districts and schools were free to consult with local industry representatives so that a relevant and effective curriculum could be implemented for each POS. Evaluation of programs was a major concern of the state, but these evaluations tended to be more formative than summative. As one state official said, “I cannot sit there and say, ‘Well, if you cannot meet this, we are going to pull your money away.’ It is not that way.” Rather, the interviewee noted, “As the finish line draws near on Perkins IV... we are giving them enough time until then to get their act together.”

Enablers

- ***Support of the CTE community:*** Identified by California and Pennsylvania, the desire of the CTE community to push for better POS helped to spearhead and encourage these efforts. One California member indicated that support of the superintendent and the assistant superintendent for the POS implementation was particularly helpful.
- ***Effective cooperation between state and local educators.:*** Minnesota had “a couple of coordinators that are with the Perkins program that [worked] directly with the postsecondary institutions within our area and within the state as well to help coordinate these pathways of study.”
- ***Local advisory committees:*** Across all nonparticipating states, the local advisory committees were “responsive to the needs of the local economy, referring to the programs of study around the state because... the programs they’re running up in the Upper Peninsula are [going to] be very different than what they’re going to run down in the southeast part of Michigan.” The committee thus served the needs of the communities, even the more rural communities that had specific needs.
- ***Highly skilled secondary teachers:*** One member reported that his or her district in California had a lot of teachers with doctorates teaching at the secondary level, which facilitated the certification of courses. A Kentucky respondent also said that “at any rate our teachers [were] professionals and so they... continually [looked] for ways to improve our programs.”
- ***Strong buy-in:*** Michigan developed its “process with input from the community colleges so... there was a buy-in... and support for the process from the start.”
- ***Responsive to local needs:*** Interviewees in Michigan and Minnesota specifically stated that their POS were responsive to local needs. According to a Minnesota interviewee,

“the fact that we went to the teachers and business partners to identify the skills that mattered and built POS from those skill sets has been a valuable approach. They used the database and skills that came out of the careerclusters.org work. They did not just rely on that. They used that as a basis of discussion and then established for themselves skills that they deemed appropriate.”

- **Supporting websites:** In Michigan, websites provided expert information and resources for people creating POS.
- **Training, networking, and collaboration:** One California member noted that having the opportunity to contact others for TA was helpful. Another California individual noted that staff from his or her district had received trainings from postsecondary institutions on a variety of topics. Michigan also provided monthly trainings via webinar and one in-person training for teams drafting POS.
- **DACUM:** Most interviewees from Pennsylvania cited DACUM as helpful in the development of POS.
- **Background data:** One interviewee from Pennsylvania cited the *Jobs for the Future* survey as a valuable resource in developing POS.
- **Integration of electronic data:** Minnesota integrated and maintained electronic data. “So those kinds of things, the maintenance of this data, the entry of it and then the maintaining of it, [was] something that is not easy to do but it, I think it’s a good thing in the end. And we are getting to a place where we’re figuring out how to do it efficiently and make it work.”
- **Financial, technical, and other assistance:** Several California, Michigan, and Pennsylvania interviewees indicated that their programs had received cash grants, equipment, or in-kind donations from the local colleges, civic organizations, and state governments.

Assistance received for POS development. As mentioned, nonparticipating states did not receive NRCCTE TA for the implementation of their programs. However, state departments of education and advisory panels provided TA and grants to the POS teams in California, Michigan, and Pennsylvania. California also received assistance from its State Center Consortium.

Specifically, California received approximately \$2 million in funding from its department of education to develop POS. California’s government issued municipal bonds to support CTE programs. Additionally, one member reported that local Kiwanis members, Rotary Club members, and Boy Scout troops provided in-kind support through service projects.

In Michigan, the W. K. Kellogg Foundation assisted with securing POS in community colleges. Additionally, the Michigan Department of Education provided training to the colleges during the implementation phase of POS. The Michigan Department of Education conducted trainings around Week 10 of the development process and met via webinar once per month with the

colleges. They also created websites that provided additional information and resources on forming POS.

In Pennsylvania, an out-of-state consultant provided TA. This consultant served on the Governor's Green Government Council and served as an expert during the development of green-focused additions to the POS. A representative from the Department of Energy and the Department of Environmental Protection provided further assistance. According to one interviewee, this representative served "in regards to Phase 3 of the POS development, and we had him on board as a sort of a steering committee, too."

Two states, Kentucky and Minnesota, did not receive TA or grants to develop POS. When interviewees were asked if other assistance was available for developing POS, one interviewee from Kentucky replied, "No, I do not know of any." The Minnesota state report did not mention receiving assistance for POS development.

Ability to pursue POS development without the NRCCTE TA. Without the NRCCTE TA, California, Kentucky, Michigan, Minnesota, and Pennsylvania used expert resources from state government, secondary and postsecondary education, and business and industry to develop and execute POS. One interviewee's words summarize the process for all nonparticipating states:

We have our curriculum that our teachers [worked] together and [wrote] for us, one that's [included] the postsecondary segment who [worked] with us as well and the trades as well that [was] sitting with us and we [tried] to best train our students, as we [said] to 'make money for their bosses' quickly as possible.

In addition to developing and implementing new POS, states also strengthened curricula and articulation agreements of existing POS. Interviewees from two nonparticipating states, California and Michigan, explicitly stated that their teams identified weaknesses and worked toward fulfilling areas for improvement in POS. For example, a representative from California said:

One of the weak points in our engineering program across the district [was] providing hands-on and trades skills to students, then [transferring] those to certificate as well as four year university degrees. And so, we've been working on trying to develop a crane infrastructure technology lab where students can learn the skills and requirements to meet a general contractor license as well as pursue lead certification that really ties architecture into our engineering program.

The POS developed and implemented were not green-focused. Although Michigan created green-focused initiatives as part of the NRCCTE TA grant application, the development and implementation of green-focused POS was encouraged but not pursued, just as in the remaining four nonparticipating states. Although greening was encouraged in Pennsylvania—"if they did not identify green, they [had] the opportunity to add green to the programs in their area,"—it was lacking in the POS that were developed, according to a representative from Pennsylvania.

Barriers

Many interviewees explicitly discussed existing barriers to the development and implementation of POS.

- **No NRCCTE TA:** The lack of NRCCTE TA was a major factor in preventing the progress of green-focused POS development in all nonparticipating states.
- **Budget concerns:** Several respondents in California and Michigan described budget cuts and other financial-related problems as difficult to overcome. One in particular noted that the budget cuts led colleges in a California district to do away with articulation agreements altogether.
- **Time constraints:** In Minnesota, the development and implementation of POS was “a lot of work and it’s time-consuming. In many of our smaller school districts we’re asking guidance counselors to do the work and they [did not] have a lot of extra time and so there’s been some resistance from the secondary team teachers. Postsecondary faculty [were] involved, but right now at this point [they] don’t have to dedicate as much time as the secondary folks do.” A Michigan respondent also described time constraints as a barrier to developing POS because work done under grants must be completed before working on non-funded projects.
- **Communication:** In California and Kentucky, communication issues were a barrier to developing and implementing POS. In Kentucky, one interviewee described “stereotypes” and people who were “stuck in their ways” and thought that breaking down existing stereotypes was necessary. Terminology also contributed to the communication barrier. As in California, several members noted that because of the size of their districts, it was sometimes hard to coordinate with the representatives from other sectors. One member thought that information about the program was not disseminated adequately to parents and students.
- **Turnover:** Both Michigan and Pennsylvania experienced turnover in their government systems. According to one interviewee in Pennsylvania, “Government leadership has changed and some of the top-level people in the department of education are no longer there. Some of them still are but some of them are not, so it’s hard to say exactly what’s going on there. Hard to get that continuity.”
- **Postsecondary leadership in government:** Because CTE was housed in the Department of Education in Michigan, staff members in charge of forming POS lacked postsecondary guidance. One interviewee stated, “Without the leadership on the postsecondary side, it just becomes money that’s distributed to the postsecondary partners with very little state guidance or direction to reach certain goals.”
- **Autonomous institutions of higher and postsecondary education:** Michigan’s higher education institutions did not transfer all courses taken at a community college, claiming “that’s not part of our transfer program.”

- ***Inflexibility of postsecondary institutions:*** Michigan’s secondary programs, according to one interviewee, “have a very top-down, from the state level, mandate. They have a solid core curriculum. They don’t have a lot of flexibility in what can be taught and even when it can be taught. So they don’t have a lot of flexibility.”
- ***Gaps between secondary and postsecondary:*** The secondary and postsecondary education systems delivered “the instruction and standards in a very different format or in a different time sequence” in Michigan.
- ***Faculty credentialing:*** One member noted that some California colleges did not want to accept credits from secondary schools because they viewed secondary school instructors as not having the credentials to teach courses that met standards for college credit.
- ***Lack of cohesiveness:*** One respondent noted that the California system lacked a common curriculum across districts, creating some confusion between secondary and postsecondary entities.
- ***Lack of demand:*** One respondent noted that in California there was currently an overflow of students into the colleges in their area and, as such, it was hard to establish articulation agreements due to lack of demand for new students and programs.
- ***Changing landscape:*** “I think the changing landscape of postsecondary colleges here in Minnesota... you know, they’ve had a lot of changes on the postsecondary level... every year the pathway of study is a little different. You know, it [needed] to be updated, it [needed] to be tweaked... if you [had] a student starting out as a 9th or 10th grader, by the time they’re a senior, they may have had three different documents or three different pathways for something as things [changed].”
- ***Inefficiency/duplication of effort:*** “The biggest challenge [was] the way it [has] been structured in Minnesota. It [was] locally-driven, so that means we can’t, we don’t put a big blanket over it and say here’s a program of study in automotive... each building [had] a different template. So you [had] to have the people power and the people willingness to do the work, to meet and talk and do all of that. So, even though I think it’s a good model... it still [was] very cumbersome and time-consuming.”

Ramifications of Not Receiving the NRCCTE TA

Not receiving the NRCCTE TA hampered development and implementation of green-focused POS in Michigan, Minnesota, and Pennsylvania. Without the TA, Michigan developed green-focused initiatives, yet never proceeded with their actual creation, whereas Minnesota and Pennsylvania never developed or implemented green-focused POS at all. One interviewee from Pennsylvania specifically highlighted the lack of greening in the POS: “I think they could have helped us focus more on the green, not so sure [with] some of the statewide programs of study, that they fully understood green.” According to this interviewee, had the TA services been available in Pennsylvania, “we would have been further ahead in that aspect.” Representatives

from Michigan and Minnesota made similar statements. An interviewee from Michigan noted, “Getting a technical assistance grant would have allowed [us] to say we got our grant to do this, so we need the time to work on it.”

Likewise, the TA services would have facilitated the process of creating green-focused POS in Michigan, Minnesota, and Pennsylvania. TA services would have helped focus efforts by providing a clear mission and core organization. Multiple interviewees discussed both duplication of effort and divergence of similar efforts at the local level. For example, in Minnesota, each consortium had a minimum of seven POS, but as one interviewee put it, “They [were] locally driven and they [looked] different in different places.” Providing a clear mission and core organization would have aligned Minnesota team members’ work with their mission and goals, focusing their efforts on creating a green-focused POS. As one interviewee stated:

Well, I think it is very good when we can... organize the project in such a way that we can be associated with a base, with a core organizational group to make sure the project is successful and succeeds in a way that we need. And if we are not able to do it, then we all kind of lose track of each other and I do not think it goes quite as smoothly.

The absence of TA services also hindered communication among secondary and postsecondary education, external partners, and other states. One interviewee from Michigan said:

It would have improved the collaboration between the two departments. Because of the requirements of the technical assistance, we would have been able to have more conversations between the two different departments. One thing we are always anxious for is to have some way to communicate, but sometimes the structure of government stops that... It also would have given us a chance to work with external partners and be able to support that effort. That is a stronger opportunity because you get people from the field working with it, people that are not part of the government. You get more eyes to look at it before you are done.

Communication with other states would have provided Michigan, Minnesota, and Pennsylvania with broader POS viewpoints. One person from Minnesota said: “The NRCCTE could have given us much better access to data... [we] did not have access to the data on the different assessment instruments, on different states’ approaches, and how they were all fitting.” Had TA been available, states would have been able to share resources, success stories, and barriers to implementation. Furthermore, Michigan could have learned about and replicated other POS.

A Minnesota interviewee also claimed that TA services would have helped in promoting local engagement.

We still do not have total buy-in... we [were] trying to build buy-in of “Now let’s use this as a tool” and how it’s different from other tools that we have already been using for guidance and counseling.

State-level reports from two states, California and Kentucky, did not mention ramifications from not receiving the NRCCTE TA.

Impacts

Because nonparticipating states lacked the NRCCTE TA, they did not pursue green-focused POS and, consequently, no green-focused model POS were developed. Asked if any activities associated with the TA application were pursued after not being accepted, an interviewee from Kentucky answered, “No. No, we did not.” Another Kentucky interviewee stated:

No, we ended up dropping it at that time. Like I said, we did have a few and of course we are like everybody else. We wear so many different hats that we really just did not have the time to put on the project when we did not have the assistance that we were hoping to get.

Although nonparticipating states did not benefit from the NRCCTE TA, interviewees from all nonparticipating states thought that their POS team would continue to work together in the future to develop and improve POS. All states said they would continue to develop POS. When asked about plans for the future of POS development, a Kentucky interviewee stated, “we are continually looking for upgrades and for ways to add to our knowledge and improve our message.” A California representative mentioned the state continually assessed where they could do a better job with current projects. “We have all these seven different pathways and so forth... we are just always doing lots of work and initiatives to do a better job with what we are doing.”

Additionally, three states, California, Michigan and Pennsylvania, indicated that they frequently conducted research on their POS to determine their effectiveness and areas for improvement. For example, Michigan worked with a community college to review, assess, and realign its curricula to match secondary education and changed some of its textbooks in order to improve course sequences.

Synthesis

The following sections present a synthesis of the results based on the cross-case analysis for each research question posed at the beginning of the study:

1. What value did the TA add in the context of POS in the five participating states in comparison to those applicants that did not receive TA services?
2. Is the TA facilitator model a good model for change? Can significant change as a result of TA be identified?
3. How can the TA be improved?

Comparative Value Added of the NRCCTE TA

The primary value added of the NRCCTE's TA to the development and implementation of green-focused POS in comparison with participating states' previous POS experience and the experience of nonparticipating states is described here. Initially, all 10 sampled states applied for NRCCTE's green-focused POS TA because of the Perkins IV requirement of implementing POS in all states. All of the states indicated that they had responded to this requirement by implementing POS at the time of the interview, but none reported any substantive progress with implementing a statewide, green-focused POS. At the time of the application, the anticipated value added by the TA included the following:

- Faster help in meeting the needs of the emerging green industry
- Provision of more career pathways for students
- Better alignment of and enhanced collaboration and cooperation among state administration, secondary and postsecondary education, and industry partners
- Increased understanding of POS and OVAE expectations
- Improvements in the cohesiveness of statewide POS efforts
- Supplementary funding for POS development and implementation beyond that already available through Perkins IV

Prior experiences with the POS models were often diffuse and locally driven processes, with some coordination from states' education infrastructure. When questioned about the role of government in the process of model development and implementation, participants from both the participating and nonparticipating states described a combined "top-down, bottom-up" process, in which the state government focused mostly on policy development, whereas the local institutions focused on model implementation. Because POS were developed in a "bottom-up" fashion by local or regional consortia, the resulting programs tended strongly to reflect the preferences of industry and needs of students.

For the period under consideration, it should be noted that both participating and nonparticipating states received some form of TA. Moreover, the types of support that nonparticipating states had to build for themselves resembled facets of the NRCCTE TA that was provided to participating states. Results from the comparison of participating and nonparticipating states suggest that the value added from the NRCCTE's TA fully corresponded to the anticipated effects. Specifically, the following value for participating states could be identified:

1. The group of stakeholders included in the process was larger, more diverse, and more cohesive.
2. Efforts were more focused and oriented toward achieving specific goals.
3. The development process was substantially more efficient.
4. Understanding of and adherence to the OVAE model for POS (OVAE, 2010) was improved.

Moreover, the facilitator played a significant role in realizing each value added.

Expanded stakeholder participation. One of the most common positive impacts noted by interviewees in participating states was increased communication and improved relationships among individuals from the various sectors across the state—secondary education, postsecondary education, state administrators, and representatives from business and industry. Team members from Georgia, Illinois, Ohio, and Oregon noted that working closely with a diverse group enabled them to understand the needs and challenges faced by the various sectors represented in the development and implementation process. Interviewees who participated in the TA process in Georgia, Ohio, and New Jersey also reported success in improving alignment between the needs of the education system and the needs of the business sector, which may improve the desirability of future graduates to potential employers.

Nonparticipating states also emphasized that expanded stakeholder participation helped in the process. For example, California and Pennsylvania interviewees reported that the support of the CTE community was particularly helpful and encouraging. In all nonparticipating states, respondents reported that local advisory committees were crucial in meeting local needs. California and Kentucky interviewees particularly noted the expertise and professionalism of their teachers. Michigan interviews indicated that strong buy-in from the state's postsecondary system was valuable. In Michigan and Minnesota, responsiveness to local needs improved the implementation process. In California, having the opportunity to network with other team members was helpful in the implementation process.

Although both participating and nonparticipating states benefited from increased stakeholder involvement, participating states had a more cohesive process for ensuring and leveraging commitments by a broad stakeholder network. In essence, enablers in nonparticipating states appeared to be related to developing supportive networks and finding opportunities for funding and external technical support. This ad-hoc process led to a less organized effort in developing POS in the nonparticipating states. Participating states, on the other hand, noted the inclusion of technical and industry expertise as well as the centralized assistance of the facilitators and the TAA as being most helpful. This appears to have contributed to the overall cohesion of the POS effort in the participating states, as well as their enhanced understanding of the expectations and concepts of the OVAE POS model (OVAE, 2010).

Increased focus on achieving goals. Participating states reported having achieved several goals related to POS implementation. First, team members in all participating states continued to focus on developing green-focused POS; in each state, the team completed a draft green POS model by the end of the 2009-2010 fiscal year. Nonparticipating states, however, did not pursue green POS development. Although Michigan developed green-focused initiatives, the state never created a green-focused POS. Interviewees from non-participating states indicated that TA services would have helped to focus efforts by providing a clear mission and core organization and by avoiding duplication of effort and divergence of similar efforts at the local level. Minnesota asserted that providing a clear mission and core organization would have helped team members to align their efforts with the mission and goals of the state POS efforts, including development of green-focused POS. Michigan noted that not receiving TA services also hindered communication among secondary and postsecondary education units, external partners, and other states. Instead, they focused on non-green POS development. Although all states received some form of TA,

states participating in the NRCCTE TA appeared to be more cohesive and were able to work directly on the development of green-focused POS.

Second, in 2010-2011, participating states made progress toward developing core content and articulation agreements, aligning curricula between secondary and postsecondary institutions, identifying and setting standards, and providing online resources to support local POS implementation. In Georgia and Ohio, for example, respondents indicated that they had developed a number of articulation agreements between secondary and postsecondary institutions. Interviewees in Georgia, Ohio, and New Jersey also reported success in improving alignments between the needs of the education system and the industrial sector, thus improving the desirability of their future graduates to potential employers. In Illinois and Oregon, teams were able to implement web-based resources to support POS implementation. Interviewees in New Jersey, Illinois, and Oregon indicated that they were able to increase their inclusion of various stakeholder groups.

Third, all five participating states reported their intent to continue implementation of the green-focused POS in 2011-2012. Ohio planned to implement at the school level. New Jersey reported that it would implement six new curricula, developed out of the green-focused POS, in the coming year. In Oregon and Ohio, interviewees expressed a desire to engage four-year institutions to try to expand the POS through the baccalaureate level. New Jersey, Ohio, and Oregon interviewees said they were planning professional development activities for teachers to train them in implementing the new POS. California was the only nonparticipating state in which respondents specifically mentioned implementation of new POS in 2011-2012. Michigan reported that it intended to review and revise existing programs with the intent of developing them more fully. All states reported plans for increased staff development training activities.

Finally, members from each participating state mentioned that the model used to develop the green-focused POS would be likely to be used again when developing additional statewide POS and would also be used in developing other curricular innovations. This further use of the model includes self-assessment and continuous improvement strategies. It is believed that the green-focused POS will be used as a model for replication and that the lessons learned will allow them to move forward with plans for widespread implementation of POS models, particularly with improved articulation at the state level.

Increased efficiency in the development process. All five participating states reported different levels of experience in developing POS at the beginning of the project, but in all, an initial POS model was complete by the end of 2009-2010. In Oregon, Georgia, and Illinois, a single team within the state managed the POS development process. In New Jersey and Ohio, teams divided into working groups that managed different portions of the POS development process. In Georgia, staff turnover hindered the development process; in Oregon, budgetary and economic issues slowed progress. Additional assistance from other sources, including funding and resources gained from other grant initiatives, further enhanced efficiency in Georgia, Illinois, and Oregon.

Across all participating states, the integral involvement of the facilitator was mentioned as a key factor that contributed to the efficiency of the development process. The facilitators were

credited with enhancing communication with the team and bringing expertise to the process. Interviewees in Georgia and Oregon mentioned that an outside perspective was particularly useful. In four of the states (Georgia, Oregon, Ohio, and New Jersey), the facilitators were able to keep POS implementation processes “on track.” Facilitators were noted to have provided leadership in Ohio and motivation in New Jersey. The facilitator in Georgia also helped resolve communication issues between the team members. However, more consistent and cohesive involvement by the facilitators in 2010-2011 could have increased the efficiency of the process of development for implementation.

In nonparticipating states, POS models were developed by forming committees and teams to address various aspects of POS implementation. These teams were composed of individuals from the public, private, corporate, and education sectors. Only in Minnesota did interviewees report some difficulty with consensus on the definitions and expectations of the POS program. After initial meetings, groups identified possible articulation agreements between institutions, developed advisory panels, created education consortia, and learned more about industry partners. Despite similarities among the nonparticipating states, the process of actual implementation of green POS varied by district, with final approval from the state. California reported forming “Rapid Response Teams” to respond to grant requests in a more timely manner and formed a community of teachers in one district to provide additional support to instructors who were responsible for POS delivery. Michigan produced a statewide technical guide to which the individual districts could refer for further assistance. California respondents reported being approximately two years away from being able to implement a fully developed POS, and Michigan interviewees reported having implemented approximately 30 POS across the state, although these POS were not green-focused.

Increased understanding of the OVAE model for POS. The difference in support between the participating and nonparticipating states influenced levels of understanding of the OVAE model (OVAE, 2010) for POS. For the participating states, the initial form of TA for the model development process included facilitated in-state meetings, work on a standardized self-assessment, attendance at the national TAA meeting in Washington, DC, and participation and presentation at the Career Clusters Institute in Denver. Reportedly, the TAA was particularly valuable to the representatives from the participating states because definitions of POS, green POS, and the expectations of the OVAE model were clarified, and participants had an opportunity to share their experience across states. Moreover, all participating states conducted a self-assessment. Although the self-assessment process varied widely across states, self-assessment was regarded as helpful in identifying problem areas and provided additional opportunities for state team members to interact. The assigned facilitators provided continued guidance and clarification and offered problem-solving and “help-desk” services to the state teams as they continued to develop their green-focused POS models for implementation. Facilitators reportedly were particularly helpful and appreciated in the process. Although nonparticipating states also received diverse forms of TA (e.g., from state departments of education, postsecondary institutions, or external consultants), that support did not flow directly through OVAE, and thus took the form of guidelines rather than specific directives. The individual districts within the states still bore the responsibility for identifying and developing POS models (as in California, Michigan, and Pennsylvania). In essence, decentralization of

support and TA contributed to diversity in POS models and programs from district to district within those states.

Increased adherence to the OVAE model for POS. Only two nonparticipating states, California and Minnesota, specifically reported that their POS models met OVAE (2010) standards (i.e., developing articulation agreements, coordinating a sequence of courses, and earning postsecondary credit or certification). In contrast, all participating states except Georgia reported meeting all minimum guidelines for POS implementation. Georgia reported difficulty with meeting the postsecondary credit guideline, mostly because previously existing legislation hindered the establishment of dual enrollment programs. The participating states also reported that prior to the TA, their POS had been individualized to districts (much as in the nonparticipating states), and that they had lacked a green focus. After the TA, the states reported that their efforts were more focused and aligned with the OVAE model.

The Facilitator Model as a Model for Change

Overall, the TA facilitator model was a good model for change in that it enabled states to make substantial progress on their POS. The facilitator model contributed to significantly focused and efficient change in participating states compared with progress in nonparticipating states. Moreover, the facilitator model contributed to POS development and implementation in terms of time, resources, and effort. The components of the TA facilitator model included facilitated in-state meetings, the national TAA in Washington, DC, and the Career Clusters Institute in Denver, supported by content area expertise provided at the national and state levels. Summaries of the impacts of each component and the particular role of facilitators on the development and implementation of POS are presented below, along with a summary of changes that resulted from the TA facilitator model in general.

In-state team meetings. Without the TA facilitator model, in-state meetings might never have occurred. Even if they had, it is unlikely that such a diverse group of stakeholders would have been engaged in the process. The key feature of the in-state meetings was bringing together a diverse group of stakeholders who eventually bought into the process because they better understood their organizational and contextual differences. Overall, state meetings helped improve communication and collaboration among various stakeholders in Georgia, Illinois, Ohio, and Oregon. All states reported that the in-state meetings contributed to participants' increased understanding of the roles and responsibilities of different sectors, one of the NRCCTE TA's objectives.

National TAA. The TAA in Washington, DC, reportedly was helpful in moving along the model development process in Georgia, Illinois, and Ohio. Specifically, individuals in these states reported that their states' accelerated progress was prompted by the "guidance they received from experts" and the "team building" that occurred because of state teams' opportunity to work together face-to-face and with people from other states.

Career Clusters Institute. Each state presented its progress made in 2009-2010 as part of the TA offered at the Career Clusters Institute in Denver. Interviewees from Ohio reported that the Institute provided them with additional resources and training on green POS. Moreover, the

requirement that each state make a presentation at the Career Clusters Institute forced states to focus on and make progress in the desired direction (an indirect effect).

Role of the facilitator. Facilitators served key roles at national and in-state meetings and throughout the project. Most members saw their facilitators as an invaluable part of the process, especially in Ohio. Particularly positive or useful aspects of the facilitator’s role are listed below, along with examples of how facilitators promoted change.

- **Kept team on task:** In all participating states except Illinois, the facilitator reportedly helped keep the team on task, focusing on what was important and on producing deliverables, resulting in meetings that were more productive. For example, one interviewee reported that the presence of the facilitator helped in “getting people to produce the deliverables, the outline, and the content, and getting consensus on that. [The facilitator] did a lot during the meetings to facilitate those things.” The role of the facilitator was considered especially important in Ohio, where there was a perceived absence of leadership.
- **Provided knowledge:** The facilitators provided knowledge to the participating states by helping teams understand the process of developing POS, providing perspective, and connecting teams with helpful resources and information. Interviewees from Illinois suggested that the facilitator was particularly helpful in establishing a forum for members to discuss and clarify their roles and responsibilities in developing a POS. Additionally, an interviewee in Georgia said the facilitator helped the team identify items that it had overlooked and left incomplete. The role of facilitators was frequently described as integral to the POS development process, especially in terms of the valuable knowledge and independent, external perspective they brought. Specifically, in Ohio, the facilitator reportedly proposed interesting questions that helped the group think in new ways while at the same time keeping them on track and moving forward. The facilitators in Georgia and Illinois brought in content-area experts and began dialogues among people from specific states to address relevant issues. The facilitators in Ohio and New Jersey worked to ensure that all group members had opportunities to contribute, so that a variety of viewpoints and facts were considered. The facilitator in Oregon helped connect the team with resources and information by assisting the team in “identifying what these tools and strategies might be.”
- **Improved team communication:** The facilitator was mentioned in responses from all participating states as being an important contributor to the model development and implementation process, especially in terms of enhancing communication.
- **Facilitated model development and implementation:** Facilitators reportedly contributed in all states to the model development and implementation process. Due to the presence of the facilitator, the TA process was frequently described as more thorough and focused than any training the interviewees had previously received. Developing the green-focused POS was similarly described as more straightforward, with better communication than similar processes in the past, because of the presence of a facilitator.

TA facilitator model in general. All participating states reported that the facilitator model was beneficial and helped them make progress in developing and implementing POS. Specifically, the TA helped participating states by improving content knowledge, collaboration and communication, the quality and quantity of POS, and POS progress overall. Summaries of these gains are presented below, along with summaries of gains at the state and organization levels.

- **Knowledge and resource dissemination:** The TA helped educate the state teams about the five objectives of the TA, including: (a) increasing understanding of the POS framework, (b) understanding the roles and responsibilities of different sectors, (c) providing green-focused information, (d) identifying barriers and obstacles to student participation, and (e) providing states with new tools and strategies. Every state team reported that the TA was particularly useful in helping them understand what was required to further the development of POS within the state and how their state frameworks were aligned with the national framework. Members from all states reported an increased understanding of the roles and responsibilities of different sectors in relation to successful CTE because of meetings with broad participation and hence improved communication. Members from all states, except New Jersey, agreed that some information was provided about green-focused industries and programs. Members from Georgia, Illinois, and Oregon indicated that the TA helped address barriers and obstacles to student participation in POS by providing insights into the development of articulation agreements as a part of the POS development process. Members from Ohio and Georgia reported being provided with tools or strategies to help with the process of developing green-focused POS. For example, one of the strategies that helped Georgia was presentations of the experiences with developing articulation agreements in other states.
- **Collaboration and communication:** One of the most commonly mentioned effects of the TA was improved communication and relationships among individuals across states. Working together helped team members share perspectives on topics and issues, allowing them to see the bigger picture. Members of organizations that had never worked together before were now systematically engaged in a collaborative effort to improve POS within the state. The inclusion of a variety of perspectives positively influenced how the teams approached the project. As a result, “a better sense of community for everyone” reportedly was established, resulting in stronger relationships among secondary, postsecondary, and other education institutions and stronger connections between education and industry. Organizations also saw improved communications and relationships with their state government departments. The collaborative nature of the project also helped to augment team members’ buy-in, increasing support for the development of statewide, green-focused POS and the emergence of new state leaders.
- **Improve and create new POS:** The TA helped all state teams to improve the organization and structure of POS and clearly define the processes for students. The TA helped most state teams become more aware of the OVAE standards (OVAE, 2010). States thought their green-focused POS satisfied all the requirements. Interviewees frequently noted that the facilitators and TA process also assisted them with aligning and adapting their existing work with the OVAE standards.

At least one individual from every state except New Jersey specifically indicated an intent to implement statewide the POS model developed as part of the TA or use the model to develop additional POS. This included the use of self-assessment and continuous improvement strategies. It was believed that in the future, the green-focused POS would be used as a model for replication and that the lessons learned would allow states to move forward with plans for widespread implementation of POS models, particularly in terms of improved state-level articulation. Interviewees projected that the improved organization and structure of the POS would enable states to better market green-focused POS and increase enrollment.

- ***Past and continuing progress:*** The TA reportedly helped states reach outcomes related to POS much more quickly and efficiently and laid the groundwork for sustained progress in the future. All states reported having at least an initial draft of a POS developed by the end of the first year of the TA. In terms of sustainability, team members mentioned their intentions to continue working together to develop POS and other related projects, despite the termination of the TA. As a whole, team members appear to be dedicated and willing to continue with statewide efforts.
- ***Perceived gains for the state:*** Interviewees believed that all participating states benefited from the relationships that were developed and from the products that resulted from the process. The improved relationships helped states realize that people are receptive to statewide models if the model is of high quality. Additionally, it was believed that states benefitted from staying current with the latest trends in CTE. Eventually, this should lead to an overall improved education system for students.
- ***Perceived gains for participating organizations:*** Team members reported that their participating organizations benefited from the relationships and networks that were established, improving marketing for the organizations and the ability to move forward with additional initiatives. Organizations would also benefit from the creation of a better prepared workforce, stemming directly from the POS that were developed.

Room for Improvement

Areas for improvement of the TA are largely related to participant expectations, information dissemination, and allocation of time and resources.

Increase the amount of TA. One interviewee indicated that additional national meetings could be beneficial. These meetings may lead to knowledge expansion, continued knowledge sharing, and increased accountability for progress toward statewide POS implementation.

Ensure consistency in the implementation of the facilitator model. Reports on the quality and quantity of interaction with facilitators varied widely among states and team members. Some suggested that the TA should better communicate what the roles of the facilitators are, for both the teams and the facilitators themselves. Additionally, as one interviewee in Ohio suggested, it may be valuable for the TA to train state leaders on how to use the facilitator most effectively. Improvements could include better scheduling or protocols for facilitators to follow if they miss

meetings, so they are still able to provide adequate support to the states. It is speculated that reports regarding the quality of facilitators may have varied because the facilitators reportedly were to work primarily with state leaders rather than the team as a whole.

Increase clarity about the TA. Interviewees varied in their understanding, conceptualization, and expectation of how the TA would operate going into the project, a discrepancy that could be addressed through improved communication about the scope and direction of the project. Some interviewees questioned the quality of the TA they received. Others were unclear whether there was to be TA in 2010-2011 or not. One suggestion for improvement is to use continuous (at least annual) evaluations to identify areas for improvement throughout a project like this. Valid concerns could then be addressed before the conclusion of the project.

Extend time and commitment. Time and resource constraints were reported by all states in the sample. The timeline for the TA was “overly ambitious” and fell short of the time needed for states to accomplish project goals. It was noted that time constraints may not be the fault of facilitators, but rather a constraint brought about at the funding level. Time also was reported to be a general issue, particularly in terms of the time team members needed to spend on project-related activities in order to make progress. Several team members reported having to take on additional work in addition to already full schedules. State teams reported wanting more in-depth, face-to-face assistance from the facilitators throughout the implementation phase. In 2010-2011, state teams only had access to facilitators via e-mail and phone, which reportedly was a barrier to continued progress toward implementation.

Improve communication and dissemination. Improving the dissemination of information could serve the overall objectives of the TA. Additional information and training might address issues related to perceived weaknesses in terms of content delivery, self-assessment, and team-related issues. To resolve these issues, one interviewee suggested that the TA should have a web portal or Basecamp site in which participants could share documents and engage in conversations.

More content area advice and expertise: Interviewees sought more TA, specifically green-focused content expertise to help with addressing barriers and systematic tools and strategies to aid in developing POS.

Systematize the use of self-assessment: All participating states used the self-assessment tool and generally perceived it as valuable. However, interviewees’ opinions of its usefulness varied, largely depending on how the tool was used in given states. For example, interviewees in Ohio thought the self-assessment tool was “awkward” in that it was “difficult to respond to as a group because local educators would respond differently to the questions than state level educators.” In Illinois, individuals conducted the self-assessment before the first development meeting, and then regretted that decision because some team members were not involved in the process.

Conclusions

The NRCCTE’s TA can best be characterized as a centralized effort to overcome discrepancies attributable to the decentralization of the U.S. education system. States welcome it because it increases cohesion without disregarding the uniqueness of individual states and state-level

governance. In comparison with nonparticipating applicant states, participating states gained from the NRCCTE's TA in numerous important ways. First, the group of stakeholders included in the process was larger, more diverse, and more cohesive than could have been assembled without the NRCCTE TA. Second, efforts were more focused and goal-oriented. Third, the development process was substantially more efficient. Fourth, the process yielded an increased understanding of and compliance with OVAE's prescribed model for POS (OVAE, 2010).

The facilitator model significantly contributed to benefits from the TA. Facilitated in-state meetings enabled increased participation by a broad group of stakeholders from state administration, secondary and postsecondary education, and industry. The TAA in Washington, DC, helped increase the understanding of federal expectations and guidelines and provided opportunities for networking and knowledge-sharing across states. The Career Clusters Institute in Denver encouraged states to focus on and make progress toward desired results. The Institute also increased accountability because all participating states had to present their progress toward these ends publicly. Throughout different activities associated with the TA, the contributions of the facilitator included keeping teams on task, providing knowledge and guidance, improving team communication, and contributing to POS model development and implementation overall.

Without the consistent input of the facilitator in each state, the progress made would probably have been more limited. Participating states valued the knowledge and resource dissemination, collaboration, and communication afforded by the facilitator model because it (a) helped improve existing POS and create new POS and (b) led to observable progress toward anticipated outcomes. Moreover, state teams indicated sustained commitment and perceived gains for the state and participating organizations as a result. Although there is no doubt that the TA provided benefits for the participating states, the question remains whether it was worth the investment in comparison to alternative interventions that might have been funded. In essence, this study did not examine the value added, given the amount of funding available for the TA.

Overall, the NRCCTE TA has been valuable in that participating states are ahead of other states in terms of developing and implementing green-focused POS. However, participating states are not necessarily ahead in the development and implementation of POS in general. A separate study would be needed to address that question. It is also unknown whether the facilitator model is the best model for implementing federal legislation. Instead, this study could serve as the basis for a more systematic study of decentralized efforts in developing statewide POS.

References

- Alfeld, C. (2010). POS: Observations on process and structure. *Techniques*, 85(1), 52-55.
- Academy for Educational Development, MPR Associates, Inc., & National Association of State Directors of Career Technical Education Consortium. (2010). *Report on the National Research Center for Career and Technical Education annual state technical assistance academy*. Washington, DC: Authors.
- Carl D. Perkins Career and Technical Education Improvement Act of 2006 (Perkins IV), Pub. L., No. 109-270.
- Lewis, M. (2008). Effectiveness of previous initiatives similar to programs of study: Tech prep, career pathways, and youth apprenticeships. *Career and Technical Education Research*, 33, 165-188.
- Lewis, M., & Overman, L. (2008). State plans for implementing programs of study. *Career and Technical Education Research*, 33, 217-226.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage.
- MPR Associates, Inc. (2010). *Programs of study: Local implementation readiness and capacity self-assessment - A tool for local college and career readiness*. Berkeley, CA: Author.
- National Association of State Directors of Career Technical Education Consortium. (2007). *Career clusters and programs of study: State of the states*. Washington, DC: Author. Retrieved from http://www.careerclusters.org/resources/publications/State_of_the_States_Report.pdf
- National Research Center for Career and Technical Education. (2010). *Current project: Technical Assistance Academy: Green programs of study*. Louisville, KY: Author. Retrieved from <http://bit.ly/y8tncm>.
- National Research Center for Career and Technical Education; Notice Inviting Applications for a New Award for Fiscal Year (FY) 2006, 72 Fed. Reg. 32084 (2006)
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Shumer, R. (2010). *Results of Round II of the Delphi study on GPRA measures*. Minneapolis, MN: University of Minnesota.
- U.S. Department of Education, Office of Vocational and Adult Education. (2010). *Career and technical programs of study: A design framework*. Washington, DC: Author. Retrieved from <http://cte.ed.gov/nationalinitiatives/rposdesignframework.cfm>.
- Yin, R. Y. (2009). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA: Sage.

Appendix A Instruments for the NRCCTE TA Project Outcome Evaluation

TA Facilitator Instrument

General Questions

1. Please tell us about the technical assistance you provided and/or participated in via the NRCCTE-AED TA project.

Separate by phases (2009-2010, 2010-2011, later) and zoom in on these items:

- General facilitation
- In-state meetings (3 required)
- Consultations from TA providers, experts, POS, green
- Technical Assistance Academy meeting
- Team members (cross-check with our list)
- State-level academies
- Experts within states

2. Who are the key players on your state's team? Who should we definitely talk to?

Phase I: Model Development Process (2009 – 2010)

3. When did your state complete the development of the (TA) POS state plan?
4. What process was used for the self-assessment? (Group session, individuals)
5. How will the programs of study model be implemented? (Top-down [state provides model and assistance, working with school districts, etc.] vs. bottom-up)
6. What were some of the successful strategies for development?
7. What were some of the barriers in terms of development?

Phase II: Development for Implementation (2010 – 2011)

8. To what extent were you engaged in facilitating the development of
 - Curriculum?
 - Materials?
 - Resources?
 - Course sequences?
 - Articulation agreements?
 - Local planning for implementation?
 - Staff development for implementation?
 - Other

9. What are the goals that were or were not achieved as a result of your state's green-focused programs of study model development and implementation plan during the 2010-2011 academic year?
10. What were the greatest perceived obstacles to date? How did the TA help address these obstacles?
11. What strategies helped with the implementation to date (e.g., individuals who championed the project)?

Phase III: Implementation (2011 – 2012)

12. What are your state's plans for implementing the model in 2011-2012?

Outcomes and Impacts

13. What do you perceive to be the impacts/changes from the TA project on your state to date?
14. To what extent do you think your state's team will continue meeting now that the TA project is finished?

State Leader Instrument (Participating States)

General Questions

1. Why did your state apply for the TA project?
2. How many members were in your green-focused programs of study state team during 2009-2010?

Please indicate:

- The total number of individuals and their *roles* (indicate “don’t know” if unknown)
 - Cross-check whether we have the information on all individuals and affiliated organizations
 - How many of these members have been “active” (e.g., those who participated in the majority of meetings/events)?
 - Ask for the people we “should” be talking to.
3. What are the key characteristics of your state’s green-focused POS?
 4. How do these characteristics differ from previous or other POS?
 5. In addition to the Technical Assistance Academy, did your state receive other (technical) assistance to develop the green-focused programs of study? If so, what types? Please provide details:
 - Financial (e.g., race to the top)
 - Technical
 - Market
 - Other
 6. Within your state’s green-focused programs of study implementation plan, how does the role of the state government differ from that of the local education institutions?
 7. How does your state’s green-focused program of study model and implementation plan address local needs?

Phase I: Model Development Process (2009 – 2010)

8. Please tell us about the TA that you received from AED. Separate by phases (2009-2010, 2010-2011, next year) and zoom in on these:
 - General facilitation
 - In-state meetings (3 required)
 - Consultations with TA providers, experts, POS, green
 - Technical Assistance Academy meeting
 - Teams
 - State-level academies

- Experts within states
9. How would you compare the development process of state POS plans for those developed before and after your participation in the Technical Assistance Academy?
 10. Have you used the model developed for other new POS in the state?
 11. What were some of the barriers in terms of development?
 12. How could the TA have been better?
 13. To what extent were the 5 objectives of the Technical Assistance Academy achieved?
 - a. Increase understanding of the POS framework
 - b. Increase understanding of the roles and responsibilities of different sectors
 - c. Provide tools and strategies for states
 - d. Address barriers and obstacles to student participation in POS
 - e. Provide information about green-focused industries
 14. What process was used for the self-assessment? (Group session, individuals)

Phase II: Development for Implementation (2010 – 2011)

15. Please describe what happened during the 2010-2011 fiscal year. Interviewer to check for numbers where possible.
 - Curriculum development
 - Materials development
 - Resources
 - Course sequences
 - Articulation agreements
 - Local planning for implementation
 - Staff development for implementation
 - New CTE courses (green or otherwise)
 - Significant revision/modifications of existing courses
 - New articulation agreements, memoranda of understanding toward planning and implementation of green-focused POS?
 - New POS
 - Other
 - How is the state plan being implemented (Top-down [state provides model and assistance, working with school districts, etc.] vs. bottom-up)
16. How did you interact with
 - a. Team members
 - b. Implementation sites

17. What goals were achieved as a result of your state green-focused programs of study model development and implementation plan during the 2010-2011 academic year?
18. For the POS planned with help of the NRCCTE TA, please describe the degree to which your state meets the minimum standards for POS as defined by OVAE:
 - a. Incorporate and align secondary and postsecondary education elements
 - b. Include academic and CTE content in coordinated, non-duplicative progression of courses
 - c. Offer the opportunity, where appropriate, for secondary students to acquire postsecondary credits
 - d. Lead to an industry-recognized credential or certificate at the postsecondary level or an associate or baccalaureate degree
19. What were the greatest perceived obstacles in making progress toward implementation during 2010-2011? How did the TA help to address these obstacles?
20. What strategies helped with the progress to date?
21. What did your state gain from participating in the Technical Assistance Academy project?

Phase III: Implementation (2011 – 2012)

22. What are the plans for implementing the model in your state in 2011-2012?

Outcomes and Impacts

23. What changed as a result of participating in the TA project? Check for:
 - a. Positive outcomes/impacts
 - b. Negative outcomes/impacts
 - c. Unintended outcomes/impacts

Ask for the status prior to beginning the TA for each stated impact/change.

Consider partnerships; new or better POS; increased awareness, more clarity about what POS is, a better definition of POS.

24. Will your team continue to work together without the financial and technical support from the Technical Assistance Academy in the future? (Sustainability)
25. Have you been able to leverage the TA to develop more rigorous programs of study in your state? (*Including both green and non-green POS*) Will you able to do so in the future?
26. Can you connect us with individuals who can tell us about the model implementation in your state during 2011-2012? (Names, positions/roles, telephone numbers, email)

Team Member Instrument (Participating States)

General Questions

1. Please describe your role and involvement in developing the green-focused POS.
2. Why did your organization participate in your green-focused programs of study state team? What was your organization's motivation?
3. Have you been involved in previous or alternative efforts to develop programs of study?

Phase I: Model Development Process (2009 – 2010)

4. Please tell us about the TA that you received from AED. Separate by phases (2009-2010, 2010-2011, next year) and zoom in on:
 - General facilitation
 - In-state meetings (3 required)
 - Consultations from TA providers, experts, POS, green
 - Technical Assistance Academy meeting
 - Teams
 - State-level academies
 - Experts within states
5. How would you compare the development process with your other experiences (before and/or concurrently)?
6. Please describe how the Technical Assistance facilitator helped your team with the development of your state green-focused programs of study model. Check for barriers and contributors.

Phase II: Development for Implementation (2010 – 2011)

7. Were you involved in any development for implementation activities of the green-focused POS during 2010-2011?
[Skip to next section, if member has no information about the development process.]
8. Please describe what happened during the 2010-2011 fiscal year?
Interviewer to check for numbers (where possible)
 - Curriculum development
 - Materials development
 - Resources
 - Course sequences
 - Articulation agreements
 - Local planning for implementation
 - Staff development for implementation

- New CTE courses (green or otherwise)
 - Significant revision/modifications of existing courses
 - New articulation agreements, memoranda of understanding toward planning and implementation of green-focused POS?
 - New POS
 - Other
 - How is the state plan being implemented (Top-down [state provides model and assistance, working with school districts, etc.] vs. bottom-up)
9. What was your involvement?
 10. What were the greatest perceived obstacles to implementing the green-focused programs of study in your state? How did the TA help to address these obstacles?
 11. What strategies helped during 2010-2011?
 12. What did your *organization* gain from participating in the development of the state green-focused programs of study implementation plan?
 13. What did your *state* gain from participating in the development of the state green-focused programs of study implementation plan?

Phase III: Implementation (2011 – 2012)

14. What will happen in the next fiscal year (2011-2012)?

Outcomes and Impacts

15. What changes resulted from your participation in the TA project? Check for:
 - Positive outcomes/impacts
 - Negative outcomes/impacts
 - Unintended outcomes/impacts

Ask for the status prior to beginning the TA for each stated impact/change.

Consider partnerships; new or better POS; increased awareness, more clarity about what POS is, a better definition of POS.

16. Will your organization continue to collaborate with the state team without the financial and technical support from the Technical Assistance Academy in the future? (Sustainability)
17. Have you been able to leverage the TA to develop a more rigorous program of study in your state? Will you able to do so in future?
18. Can you connect us with individuals who can tell us about the model implementation in your state during 2011-2012? (Names, positions/roles, telephone numbers, email)

Interviews with Implementation Sites

[Despite the belief of some stakeholders that we will not find implementation sites, we want to try for it. If we cannot find any, we will not conduct these interviews.]

1. Please describe how your green-focused POS will be implemented.
2. When will classroom implementation begin?
3. Did you implement a similar POS prior to this green-focused POS? If yes, please tell us about it. How is the new POS different?
4. In 2010-2011, where you involved in developing
 - Curriculum development
 - Materials
 - Resources
 - Course sequences
 - Articulation agreements
 - Local planning for implementation
 - Staff development for implementation
 - New CTE courses (green or otherwise)
 - Significant revision/modifications of existing courses
5. How is the ongoing work being evaluated? Is it?
6. What were the greatest perceived obstacles during your efforts in 2010-2011?
7. What strategies helped with your progress toward implementation in 2010-2011?
8. What does your organization gain from participating in the implementation of the state green-focused programs of study?

Interviews with Nonparticipating States

(A sample from states that applied) All questions relate to the time period after the application for NRCCTE TA support and are linked to the ideas proposed in the application.

General Questions

1. Why did your state apply to participate in the NRCCTE TA project?
2. Were you able to pursue any of the proposed activities without the NRCCTE TA? *(Interviewer must be familiar with the application! See background reports.)* Check for:
 - Did you develop a green-focused POS model in 2009-2010?
 - Did you develop a non-green POS based on the model in 2009-2010?
 - Did you develop any POS with members of the team that you proposed?
 - . . .

[If none of these activities were pursued, terminate the interview.]
[If activities were pursued, those will be the focus of the remainder of the interview.]
3. Did your state receive other assistance to develop the programs of study? If so what types? Please provide details:
 - a. Financial (e.g., race to the top)
 - b. Technical
 - c. Market
 - d. Other
4. Did your state develop a program of study *implementation plan* without the NRCCTE TA support? How and why? (Can we get that plan?)
5. How does your state's program of study model and implementation plan address local needs?
6. Within your state programs of study implementation plan, how does the role of the state government differ from that of local education institutions?
7. Did your state have a *team* working on POS state plans? Please tell us about the team.
 - a. How many individuals participated on you POS state team?
 - b. What roles did the members have?
 - c. What organizations/types of industry were represented on your state team?
 - d. How many of these members were "active" members (e.g., those who participated in the majority of meetings/events)?

Phase I: Model Development Process (2009 – 2010)

8. Please describe the development process of your POS.
 - a. Did you receive support from consultants? If yes, please elaborate.
 - b. How often did you meet with your planning team?
 - c. Please describe what happens in a typical meeting.

9. What strategies helped you in the development of your POS model?

10. What were some of the barriers during development?

Phase II: Development for Implementation (2010 – 2011)

11. Please describe what happened during the 2010-2011 fiscal year? Interviewer to check for numbers where possible.

- Curriculum development
- Materials development
- Resources
- Course sequences
- Articulation agreements
- Local planning for implementation
- Staff development for implementation
- New CTE courses (green or otherwise)
- Significant revision/modifications of existing courses
- New articulation agreements, memoranda of understanding toward planning and implementation of green-focused POS?
- New POS
- How is the state plan being implemented (Top-down [state provides model and assistance, working with school districts, etc.] vs. bottom-up)
- Other

12. How do you interact with implementation sites?

13. What goals were achieved as a result of your state's POS development and implementation plan during the 2010-2011 academic year?

14. What were the greatest perceived obstacles to implementation of the POS in your state?

Phase III: Implementation (2011 – 2012)

15. What are your plans for the next fiscal year (2011-2012)?

Outcomes and Impacts

*(*many of the comparative outcomes/impacts need to be drawn from the prior questions)*

16. How could the NRCCTE TA project have improved your POS efforts?

17. Will your POS team continue to work together in the future? (Sustainability)

18. Can you connect us with individuals who participated on the team and/or who can tell us about the model implementation in your state during 2011-2012? (Names, positions/roles, telephone numbers, email)

Appendix B
State-Level Case Studies: Participating States

The Case of Georgia

Background and Context

Roles of interviewees. Interviews about Georgia were conducted with the state’s facilitator, team leader, and five team members, including representatives from secondary education, postsecondary education, industry, and the Georgia Association for Career and Technical Education.

Reasons for participating. Georgia was poised to participate in the project because the state recognized the need to “go green” and team members felt a sense of urgency to make it happen. Participating in the NRCCTE’s TA was viewed as a way to accelerate the process. As one interviewee put it, “Georgia is seen as a state that has a lot of green potential... We felt that we were positioned very well to be a leader in terms of developing green programs of study.”

Several interviewees cited a genuine interest in improving POS and adding green initiatives. Furthermore, some team members knew each other well enough to cultivate the interest and transform it into action. The collective effort ultimately helped to get the program going.

Prior experience. Interviewees reported varying levels of prior experience with movements similar to POS. One interviewee reported having worked on POS before, but not on green-focused POS. Another reported having worked with the state’s Department of Energy on industry-based training. Several interviewees reported that this was their first experience with POS.

The team. Georgia’s state team can be described as large, encompassing, influential, and fluid. A purposeful decision was made to have a large team in order to have more “movers and visionaries at the table.” Approximately 40 individuals were asked to play a role on the team, although not all helped with every stage. It was noted that “people kind of came in and they came out within the team.”

As one interviewee described, the team had “all levels represented”: secondary and postsecondary teachers and administrators as well as state leaders and education leaders. Team members had a wide variety of backgrounds and experiences.

Technical Assistance

The TA that Georgia received consisted of facilitated meetings, including the involvement of outside experts, a POS blog, and the TAA in Washington, DC. The facilitator helped bring in an expert from a postsecondary institution in another state to present information about that institution’s experiences with implementing a dual credit program. Facilitated meetings were reported to be timely and productive. Recipients of the TA responded very positively to the assistance they received.

The timing of the TA was central to its positive impact. Interviewees spoke directly to this timing: “It was just perfect timing to where the technical assistance was able to accomplish a lot

of different features.” As one interviewee pointed out, “At any moment that we needed it, communication was there from AED to be able to support this process.” It appears that standard communication (i.e., telephone) was utilized more frequently and that community-building efforts such as the blog did not produce much benefit.

Although the timing of TA was reported to be important for addressing needs, a few interviewees also noted its relevance to keeping the project moving. One commented that the facilitated meetings helped to “get our ideas together and on the right page and overcome some of the challenges as we discussed.” Another echoed this statement by saying that “the technical assistance has been very helpful as well to help us target some of our needs in areas where we were struggling.”

In the first year, the TA focused mostly on creating a common understanding and getting the group to agree to a single template for both secondary and postsecondary schools. However, in the end, the group decided that secondary schools must be distinct from postsecondary. In the second year, there has been less TA provided and fewer face-to-face opportunities to come together as a team. One team member made the following comments:

There was a lot more technical assistance in the first year than in the second, just because of the way it was structured. We had more time built in, more trips, we had the institute in DC, and so with only one trip and limited time, it was just much harder to have the kind of intensive working relationship we had had in the first year. It's been more checking in by phone and email.

In the second year, TA continued by phone, but some face-to-face interaction was expected to occur over the summer as articulation agreements were completed. For the third year, although some noted a desire to continue with the TA, the TA was not expected to continue due to funding limitations. In terms of the expected productivity of the team in the third year, one interviewee stated, “There’s just a limit of what can be done without a funded project.”

Not everyone in Georgia thought that the TA was substantial or beneficial. When asked about the TA provided, one interviewee said, “I did not have any.” Another individual stated, “There was some” and went on to say that the facilitator did not provide as much assistance as expected. “I was a little disappointed in the facilitation process.” This individual had anticipated that the facilitator would be providing TA on curriculum development but, as it turned out, the facilitator “was more someone to help get secondary and postsecondary to talk to each other.”

Additional assistance. Georgia allotted funds to supplement the project if needed, but the team did not end up using any of these additional funds. The team leader was efficient and proactive in getting needed information in a timely manner, which reduced the need for additional funding.

TA objectives. Interviewers asked team members whether the objectives of the NRCCTE TA project had been achieved. Responses from interviewees suggested that many objectives were achieved. The TA was described as having increased understanding of the POS framework and the roles and responsibilities of different sectors. Aside from the actual framework that was distributed, which was an essential tool to provide a foundation from which to work, other tools

were not provided to Georgia to help with this process. Instead, strategies were provided through events such as the presentation on experiences with articulation agreements from another state. (Most individuals commented on the usefulness of this presentation.)

In terms of increasing the understanding of the POS framework, one interviewee described how the TA helped him or her to understand the POS framework. “Based on our technical assistance, we were able to maximize the information, shared especially through the POS framework, to make sure that we were coming into the requirements needed to further our programs and further our state.” This person continued:

We were able, when we were sitting in Washington, to hear our industry representatives telling us what they were needing, what their requirements are, what they were seeing in terms of the students coming out of our program, and their qualifications or lack thereof. Hearing that firsthand, being able to sit with our postsecondary colleagues, and hearing their concerns, what was working, what wasn't working, coming from secondary was very instrumental.

The TA also was intended to address barriers and obstacles to student participation in POS. According to several interviewees, missing articulation agreements are the largest obstacle in getting students to participate in POS. With these agreements, the project has helped to satisfy this requirement of the TA. One interviewee commented on the role of the TA in this effort:

Being able to tell them—“By completing this you are going to have four to five college courses that will now be completed based on your completion of this high school course, granted that you are passing it with an 80%... then studying for a national credential after the completion of the three sequences of courses”—that was very helpful for our students, and that went onto the program of studies.

The interviewee added that it is helpful to students to see their options.

Seeing where they can enter and exit out of the secondary process, exiting after high school, or exiting after two years in a technical college, or exiting after their bachelor degree, that information was added to be able to help with our guidance and counseling.

Finally, the TA was intended to provide information about green-focused industries. Simply because the group was large, diverse, and included industry representatives, members were exposed to ideas from a variety of green-focused industries. Facilitated meetings with representatives from industry helped to provide a green emphasis. However, the choice to emphasize energy and make it green came mainly from within the team, without the aid of TA. The team, specifically the leader, sought out information about green-focused industries independently as questions arose. Thus the process of developing articulation agreements led to learning about green-focused industries, but the interviews offer little evidence that information was provided rather than acquired naturally through this process.

Programs of Study

Georgia's POS model is credit- or course-based. Students must successfully complete courses and earn credits to progress through the POS. Georgia already has existing POS and is in the process of creating more. Current efforts appear to emphasize the industry systems (the green curriculum) and then the engineering, manufacturing, and electronics pathways. As part of this project, a significant effort was made to create a template for POS that worked for both K-12 and community or technical colleges. Because of political constraints, however, local agreements between districts and the local branches of the community or technical colleges were preferable.

Differences from prior efforts. The new POS development process differed from previous program development efforts. One reason is the push by OVAE for "blanket" POS. "OVAE is wanting one POS that's throughout; we had a secondary POS and a postsecondary POS," said one interviewee.

Additionally, the push to have industry involved and to emphasize the green-focused POS engaged individuals from industry early on and kept the focus on the result. This relationship was described in the following manner:

The key characteristic was industry. When representatives from the technical community college, state level, and me [sic] sat down, we had an industry partner right there. We started brainstorming and looking at the application and looking at what we needed to do and how we needed to proceed. Therefore, from the very beginning, we had a close relationship with the industry... and so key characteristics were industry driven.

This team member described another key difference from prior experiences that stemmed from the close relationship with industry. Referring to an underlying goal for all students, "We were very focused on being able to produce workers that in a green nature would lead to a high-skill, high-wage, and high-demand career for them." The involvement with industry helped to keep the students' best interests in mind and to create a POS that stayed true to the needs of industry.

Several comments about organization and communication in the development process highlighted a new approach to developing POS. As one interviewee noted,

The original process was done in a more piecemeal fashion, whereas with the Technical Assistance, it provided a rally point, if you will, or an organizational point... to get more of the stakeholders in one place at one time, start the discussion, and consider moving forward. Some of the processes in the past had a lot of talking around, but it ends up not being acted upon sometimes.

Another interviewee perceived "greater communication, an awareness of programs."

One interviewee had a different take on the POS development process. "It was a messy process. It became a 'How do we make articulation work better in the state of Georgia process?' which is

not something we really wanted help on. That's a more internal thing, a much more internal thing."

The role of the government. State government was described as having direct and indirect impact on POS development. As one Georgia interviewee put it, "the legislature is clearly encouraging dual enrollment." A few years ago, the previous governor enacted a law that prohibited what was described as "double-dipping." As a result, secondary and postsecondary institutions were forced to fight for the state's financial support for high school students to take college credits. The law significantly limited the development of POS that could be used widely. Since the TA project started, a new law was introduced that would not strip funding from high schools when a student takes a college-level course through dual enrollment. As one interviewee put it, this law, which the business community reportedly heavily endorsed, will "support further implementation" of POS.

Addressing local needs. Because of Georgia's law on dual enrollment, local representation must assist the development of POS. Therefore, the development of POS addresses local needs through representation in both the final product (i.e., the career pathways created) and the interaction that takes place during the process.

Minimum standards for POS. When asked whether the Georgia POS model aligns with the OVAE-defined standard (OVAE, 2010), interviewees agreed that Georgia's green-focused POS accomplishes these things:

- ***Incorporates and aligns secondary and postsecondary education:*** In describing the program, one member emphasized "9-16" and the "sequencing" and "alignment" of courses. Other interviewees also commented on the alignment as "seamless between secondary and postsecondary institutions."
- ***Includes academic and CTE content in a coordinated, non-duplicative progression of courses:*** "We were able to have academic and technical courses that are articulated from secondary to two-year colleges; then your two-year colleges have a working relationship with a couple of four-year colleges, where their courses are articulated."
- ***Offers the opportunity for secondary students to acquire postsecondary credits, when appropriate:*** The state was working on this. Due to previous laws, "double-dipping" was prohibited. However, an effort to change the law on this point was underway. "With the articulation that we have now, we'd be able to earn our postsecondary credits with our academic courses and also with our technical courses through our career pathways." Thus, the state was working to allow secondary students to acquire postsecondary credits, which was not possible at the time.
- ***Leads to an industry-recognized credential or certificate at the postsecondary level or to an associate or baccalaureate degree:*** One interviewee spoke generally about a credentialing program: "There is a program where the students are able to sit for an industry credential or national certificate based on their secondary completions, and

then being able to take that information and then attend an associates or bachelor degree [program]. So, yes, I agree that we are doing that.”

Model Development and Implementation

Timing. According to team members, the development of the POS was completed “last spring.” At the time of the interviews, a completed articulation agreement for the green-focused program had just been announced, and implementation of the POS was expected to begin soon. “They’ve been trying to start a little bit of implementation as I understand it. But they have now made real headway with an articulation agreement between one of the school districts and one of the technical colleges that will allow them to go full scale implementation next year.”

Model development process (2009-2010). The model development process began with the arrival of the TA facilitator. As one member described, “When the guidance came in from AED and then we started looking at the self-assessment tool, suddenly we realized ‘We have some work to do.’” Initially, facilitation consisted of getting team members together and increasing communication. In the first year, the team also met with industry representatives, brought in a presenter on dual enrollment from a postsecondary institution in another state, and attended the Washington, DC, training. As one interviewee summarized it, the first year was about “bringing together the right stakeholders, beginning to discuss the process, evaluate where we are, and determine the best specific programs.”

When asked whether the model development process in Georgia was bottom-up or top-down, the team members described the process as “much more bottom-up.” Many influential individuals were invited to join the team at critical stages in the development process. The overall process was driven through the grass-roots efforts of the team. One interviewee noted the reasoning behind this type of approach: “The challenge is that the technical college system is very decentralized. They don’t necessarily have the same course offerings in each institution, and they do not even necessarily have transfer agreements among all the institutions in the system. So it has to be bottom-up.”

Self-assessment. The self-assessment tool (MPR Associates, Inc.,2010) was reportedly useful in model development. The tool was sent to members of the planning team and their responses were aggregated. One benefit of the self-assessment tool was identification of communication issues between secondary and postsecondary education. At first, “communication was very weak between secondary, postsecondary, and industry.” The tool helped to identify this problem early, so the facilitator could work to address and overcome the issue early on in the process.

Development for implementation (2010-2011). In 2010-2011, the team worked to get an articulation agreement in place. The implementation process was pursued at the local level, and in June 2011 an articulation agreement was completed and expected to be approved at the postsecondary level before the fall. According to one interviewee:

They’ve been trying to start a little bit of implementation, as I understand it. But they have now made real headway with an articulation agreement... that will allow them to go to full-scale implementation next year. And literally, I just got

the articulation agreement emailed to me today... They think it will be ready to be signed in August of this year. They have been working at the local level on this and feel confident that they have pulled it together.

One team member thought the implementation had made more progress. “The articulation agreements were developed and they have been implemented, and the process is working well and it’s causing the parties involved to say, ‘Okay, we need to look at doing this in other areas.’” However, other members agreed that implementation was expected to begin in the fall. Leadership changes significantly hampered progress during the year of development for implementation. One interviewee noted,

The long-time CTE director retired on September 30 of last year. The then-commissioner didn't name a replacement since he was a lame duck (having failed to secure the signatures needed to get his name on the ballot). Even after the election in November, the staff still wasn't in much of a position to move forward on any major new initiatives since the new commissioner wasn't sworn in until January. A new CTE director was finally named in January, but she resigned this week.

2010-2011 goals. When asked what goals were achieved as a result of the state green-focused POS model development and implementation plan during the 2010-2011 academic year, interviewees identified several tasks. “Better progress made with articulation; greater understanding and acceptance of our programs; looking at what our secondary curriculum does offer, what we were covering and how it matches up to our postsecondary curriculum that was achieved; a model for local articulation was completed.”

Items developed. Interviewees indicated that attention in 2010-2011 was focused on developing an articulation agreement. This task was accomplished recently. Leadership changes at the state level limited additional progress.

2011-2012 plans. Plans for 2011-2012 focused on implementation. The facilitator planned a meeting with team members to complete the articulation agreement so that it could be implemented in the fall. The implementation would start in the fall at least one site and possibly two or three others. One team member laid out a vision for implementation long past 2012. “We’ll hopefully have students gain credit that transfers to the technical college. But then, the technical college has an articulation agreement with Southern Poly. Hopefully we’re going from a secondary school, to a technical school, to a four-year institution.”

This vision of using the initial POS for future POS was shared by several interviewees and related to the plan to expand the POS to other areas or even statewide. According to one interviewee:

It actually has sparked further conversation for other areas to develop programs of study—in particular, to consider ways to do better articulation on a state level, because one of the challenges we have had in our state is not having an articulation system in place. It’s just been a little more here and there. This just

pushed forward the idea of developing statewide programs of study. So, it activated more than just one area.

Plans for the future will not include TA because funding for the project is limited. Technical assistance has tapered off since the first year and will end in 2011-2012. There is interest in keeping the TA going, but funding restrictions will limit what can be done.

Several team members expected that they would continue to play supporting roles in the effort even after funding ended. Overall, this was because they thought their service was voluntary and because there was still work to be done.

Enablers

Interviewees indicated that the following elements enabled the TA process to succeed:

- ***Communication:*** Interviewees reported increased communication as helpful. Communication was quickly identified as weak in the beginning and therefore was a focus early in the process. Team members found this very helpful. Given the history of poor communication, the facilitated effort to improve communication will likely have a lasting impact on the relationship between secondary and postsecondary institutions.
- ***Industry:*** The inclusion of industry representatives in the discussions from the beginning was cited by most as a helpful contribution to the quality of the POS.
- ***Locals:*** Closely related to the inclusion of industry, the inclusion of local institutions helped foster a bottom-up mentality.
- ***Facilitator:*** As one interviewee put it, “Having an outsider kept everybody at the table even when the discussions were a little bit rocky.” The facilitator not only helped break down communication barriers, but also played an important role as an outside perspective.
- ***Trip to Washington, DC:*** One team member commented on the trip to Washington and the important role it played in terms of team-building.

Barriers

A set of barriers was also identified:

- ***Leadership changes:*** A number of leadership changes during the second year set back the project’s timeline and limited the progress the team could make.
- ***Legislative issues:*** The former governor’s law limiting dual enrollment restricted the entire POS development process.

- **Weak communication:** The historically weak communication among people at secondary and postsecondary institutions proved to be a barrier that the team was able to overcome, but the process of agreeing on language (articulated courses and dual credit courses) took time and handicapped the team from the beginning of the project.
- **Preconceived notions:** According to one interviewee, “A lot of folks came into this assuming that they knew what a program of study was and it was just creating a green one.”
- **Resource constraints:** Due to budget constraints, TA will not be available during the implementation stage. Although the facilitator will probably be able to provide small amounts of TA over the phone or via email, the lack of TA will hamper implementation.

Impact

Interviewees cited several effects of the TA project to date. The effects listed were mainly positive. No negative effects were reported during the interviews, but some unintended effects were highlighted.

Positive impact. Positive effects included:

- **Better communication:** The most common effect mentioned during the interviews was increased communication. The TA project definitely pushed participants beyond the communication barrier to get them talking about issues that needed discussion. One interviewee said, “We were able to share why we do what we do... We really did need to have that discussion... and down the road we actually developed an articulation task force and maybe it helped force the question.”
- **Increased awareness:** Awareness increased not only for the active participants of the project, but also for many other policymakers and industry representatives. The project focused on the issues, and members of the legislature and business community have been advocating for better laws on dual enrollment.
- **Efficiency:** Although the project struggled during the second year due to leadership changes, a few interviewees mentioned that having a deadline helped to accelerate progress.
- **Leveraging for improved POS:** Several interviewees commented on the project’s contribution to improving POS in the future. One interviewee said, “It actually has sparked further conversation for other areas to develop programs of study, in particular to consider ways to do better articulation on a state level.”

- **Marketability:** Because of the project, the state now has the ability to better market POS, specifically the green-focused POS. This marketing should help draw more students to the program in the future.
- **Satisfaction:** One interviewee mentioned the satisfaction of participating in a project like this as a positive effect.

Unintended impact. Only two unintended consequences were reported. The first was the emergence of leaders. Many people are now engaged with the project and will help serve as champions for the cause. Second, as part of the Washington, DC, trip, connections were established to groups that do similar work outside the state. In at least one case, collaboration and learning occurred in facilitated discussions.

The Case of Illinois

Background and Context

Roles of interviewees. Interviews in Illinois were conducted with the facilitator, the state leader, and seven team members. The pool of participants included both administrators and educators from postsecondary education and representatives from state-level administration, industry, and government. Several participants had multiple duties in addition to their roles in the formulation and implementation of the green POS (e.g., a role within the green POS project and a role in the state education system developing other POS, curricula, or alternative articulation agreements).

Reasons for participating. Illinois had already begun working with POS at the time of the TA grant initiation. The State Board of Secondary Education, the State Department of Education, the community college board, and the Office of Community College Research and Leadership all contributed guidance and leadership in the development of several POS in accordance with state-level education reforms and the Perkins IV legislation. The consensus among respondents was that the application for the green POS TA permitted additional diversity within the general POS framework. Moreover, the addition of the TA and green POS model was expected to foster networking among secondary and postsecondary institutions, create more articulations and credit transfers between institutions, and create a stronger connection between a student's education and his or her future prospects for employment.

Prior experience. Respondents' main prior experiences in the development of POS involved the development and implementation of Tech Prep programs, the Career Clusters Model, and the NSERVE program. Respondents had not formally implemented a green POS before this TA project. However, many individuals involved in the TA project had worked with, or were at least familiar with, some of the other team members through their positions within the state education system or through work on prior projects.

The team. The Illinois team included a diverse group of individuals from a variety of sectors and institutions, including members from the University of Illinois, the Chicago Architecture Foundation, and the Community College and Junior College Boards, construction field representatives, policymakers from the governor's office, and secondary and postsecondary educators. The team changed several times during the course of the project, particularly in the education sector, but also in general leadership as well. These changes were cited as a barrier to implementation in some of the interviews.

Technical Assistance

Illinois received TA for their POS projects through three channels: the TAA conference in Washington, DC, the in-state meetings with the facilitator, and guidance on POS from the University of Illinois (another POS development project).

For the interviewees, the TAA conference was viewed as particularly valuable. As one member who attended the conference said:

DC was absolutely an excellent conference. We had group meetings where we had a keynote speaker and some people that were very, very helpful in giving us background... [and access to] ... the assistant or associate director of OVAE.

Interviewees also thought that the group discussions and breakout sessions during the TAA were useful, indicating that they helped them develop an understanding of the expectations for the green-focused POS and goals for implementation of the project. One member pointed out that participation in the TAA was valuable because of the opportunity to hear from people from other states who were involved with the project. One member found value in:

Hearing from someone that's (sic) not the same people you've been hearing from for a number of years... It was another voice other than [names omitted] ... it was somebody else in their perspective, and I think that led to some leadership that may not be possible without that perspective.

Some respondents indicated that the TAA and the meetings in the early parts of the grant were valuable because they allowed the various stakeholders involved in the project to become familiar with each other and to integrate their work.

Similarly, several respondents had the opportunity to discuss their perceptions of the impact of working with the state's facilitator. The facilitator led several discussions at a meeting in Springfield in the first year of the project and also has maintained some contact with the member sites throughout the grant. Some members saw the facilitator's work as particularly helpful, especially in helping them find direction in their work. One member appreciated the facilitator's "energy or knowledge development or generation that comes through having an informed discussion, having it facilitated with a point in mind, the outcome you're focused on rather than just having a philosophical discussion on just what to do."

One challenge the team reportedly faced was finding direction and maintaining focus on the green-focused POS because it was also working on a parallel POS and another grant for Race to the Top. Some respondents indicated negative perceptions of the TA received or indicated that they thought the TA was minimal at best. When asked about the TA received, these members indicated that they thought that they "attended a meeting in Washington where they presented the model, but that that was the only assistance we got. The participation in the conference provided some general information, very general information."

Additional assistance. In addition to the TA provided through the project, the state of Illinois was implementing a parallel POS program following the Career Clusters model. This work was under the auspices of the state's higher education boards and the University of Illinois. Assistance was in place during the early stages of development of the NRCCTE green POS TA process, and the conduct of the alternate POS sometimes took priority in the minds and agendas of members of the state team. One team member mentioned that the experience of putting together the Race to the Top application was an additional source of TA in that they learned a lot about POS when developing the application.

This alternative assistance was powerful enough that when questioned about whether the green POS program was likely to continue after the grant ended, most interviewees thought that the work would continue through the assistance of the University of Illinois and other funding sources. However, some also said that future work would probably focus more on POS in general, learning through employment and through collaboration between the education system and the Department of Commerce and Economic Opportunity instead of green POS.

TA objectives. With regard to the objective of increasing understanding of the POS framework, several respondents identified the TAA as particularly helpful. One member indicated that the people who represented the architecture foundation and other industry partners learned more about the POS framework through the TA.

In relation to the objective of increasing understanding of the roles and responsibilities of the different sectors, one member mentioned that the facilitator was particularly helpful in setting up a framework in which constituent members could clarify their roles. Another member indicated that the TA helped people from different sectors (such as education and industry) to understand the limitations that each other faced, and to facilitate communication between groups whose communication styles and needs often differed.

In relation to the goal of providing tools and strategies for states, the TA provided an opportunity to go beyond simple compliance and monitoring of local efforts by setting up a continuous quality improvement and performance management framework. Within this framework, the local districts and education entities are responsible for understanding and implementing the POS model, with help from state-level systems. This design allows improvement of the POS program beyond basic compliance.

On the goal of addressing barriers and obstacles to student participation, the TA was cited as having provided an opportunity to improve communication between the secondary and postsecondary education systems, thus allowing better integration of the POS models, which had been separate in the past. The hope is that this will allow for more effective articulation agreements and give students better access to the POS program. Finally, in terms of the objective of providing information about green-focused POS, one team member indicated that his or her knowledge about green POS was gained through the media, and that he or she thought that the TA instilled a more comprehensive awareness of the green focus. Another team member indicated that the implementation of the green-focused POS allowed the state to help students meet the needs of potential future employers. These interviewees thought that the TA and the POS had helped them improve their ability to serve the state's students.

Programs of Study

In Illinois, a three-point model is currently the foundation of the state's POS system. The first point is an interagency partnership formed to address the Perkins IV requirements. The second point involves a repositioning of prior Tech Prep efforts as the Partnership for College and Career Success in order to meet the demands of POS development within the state. The third point is adoption of the Career Clusters framework as the main model for the POS in Illinois. The green-focused POS is an additional framework that serves to ground and integrate future

development efforts. One recent change within the state, noted by interviewees, was a new data system addressing dual enrollment credits, which in turn allows more POS to be implemented.

Differences from prior efforts. The green-focused POS in Illinois differed from prior and alternative efforts in several ways. The primary difference was that the green POS program was more focused than prior or alternative POS efforts. Also, the TA project that accompanied the green POS was more comprehensive than the training and assistance the state had received in prior POS efforts. Respondents indicated that the green-focused POS TA encouraged greater use of the developed partnerships to advance evaluation and implementation of POS within the state.

The role of the government and addressing local needs. The education system in Illinois is locally controlled. Therefore educational programs, although guided by state-level policy, are developed and implemented at the district level. The primary role of government in the Illinois system is to provide a framework within which policy is set and funding is distributed. Articulation agreements and development of POS structures are handled within one of the 57 regional delivery systems and local-level consortiums across the state. The state is thus able to meet local needs through state funding that is distributed through local entities. Additionally, the regional delivery systems and local school districts are provided with models, in particular the Career Clusters framework and national guidelines, but are responsible for developing POS that are implemented at the local level. As one interviewee indicated, “If we try to cover everything at the state level in terms of each approvable POS, we’d never be able to keep up with it.”

Minimum standards for POS. Most respondents provided only general feedback on the program’s alignment with the minimum standards of the OVAE POS, apparently because some respondents had little information about specific areas of the TA project. One interviewee noted that the state had originally developed, with the University of Illinois, a set of guiding principles to guide the state program of study efforts, and that these guiding principles were not entirely aligned with OVAE’s 10 elements of POS (OVAE, 2010). The TAA provided an opportunity for the team members to integrate their previous work with OVAE’s 10 elements.

State and local consortiums have been working to align the secondary and postsecondary institutions so that students can acquire postsecondary credits and eventually enter industrial sectors with certifications. One respondent noted that:

Getting young people involved in manufacturing can have a lot of success as they exit out of high school. They can come into a production role right out of high school with the appropriate certification and a degree, and they can continue on to become an engineer... adding on to their postsecondary education.

Model Development

Timing. According to one interviewee, the initial model development was completed during late July and was focused on architecture. A model for working with manufacturing industry partners would be completed shortly thereafter. This was the sum of model development through 2010.

Model development process (2009-2010). The model development process in Illinois was described alternately as being both a “top-down” and “bottom-up” process. Before the green POS project, Illinois already had structures and partnerships in place, rooted in earlier Tech Prep grants and designed to support the process of developing and implementing the Career Clusters POS in accordance with Perkins IV.

These partnerships and consortiums thus were used as foundations for the development and implementation of the green POS; this effort was also viewed as supporting other state-level education initiatives.

The “top-down” process began with aligning the Tech Prep consortiums to work with Perkins IV and the partnership between the state and the University of Illinois. This process began with collaborations with the Chicago Architecture Foundation and focused on green architecture and construction. As one interviewee explained:

They were part of the career clusters institute, which [the facilitator] had put together for the entire initiative... [They were] putting together their model, their design model, for green POS around architecture, with the notion that they were also going to work on manufacturing after.

The “bottom-up” process refers to the handling of the development of materials and components of the POS within regional delivery systems and local consortiums. This process was explained by a team member:

It is collaboration on a local level... and so this gave us yet another opportunity to try to use local level collaboration to work on our program. The green POS was a little bit different because we try to stretch out further [through] the state than we typically would. So, we brought people from around the state that didn't necessarily live next door to each other.

Several members of the team indicated that one of the most important steps in the model development process was making the POS operational. For example, one interviewee realized through the academy that:

We really needed to operationalize what a program of study looked like. Because we had all been talking, you know, it's a fully articulated curriculum from secondary to postsecondary. And what does that mean to anyone? Folks in the field needed some way to measure what they were doing. And so, out of the work we did in the academy, we came up with the idea of building a tool that was really providing some way for kind of a cross between a guide and a check-off list.

Comparing the development process. One team member thought that the major difference between the process of developing the green POS and other POS efforts was the rapid model development. This individual reported:

In this case, things happened a lot quicker, you know. So the partners that were involved in the team, you know, it just seemed like because maybe it was part of this project or because of the way facilitation was. There were real deadlines that the state didn't implement or mandate, but the members of the team that were involved in the actual doing of the programs of study, they created them and followed through with that. So maybe more ownership, I guess...

Another major difference was the ability to bring “different people” to the process, thus allowing the team to gain new ideas and new perspectives. The opportunity to interact with members of other state teams who were also implementing a green POS was cited as particularly valuable.

Self-assessment. A group of team members completed the self-assessment process (MPR Associates, Inc., 2010) before the first official development meeting. According to one interviewee, the individuals who completed the self-assessment might not have been the same ones who were on the model development team. One interviewee suggested that the self-assessment be conducted differently.

Development for implementation (2010-2011). During the 2009-2010 fiscal year, the primary efforts in development for implementation focused on connecting the various stakeholders in the development process. These activities involved identifying team members, modifying structures and systems to align them with the POS process, learning about green-focused POS, and identifying similarities to and differences from other POS efforts. This process was a statewide comprehensive movement toward integration of the green POS requirements, the TA process, and the efforts of the local delivery systems to develop POS that met local needs.

2010-2011 goals. The major goal for 2010-2011 was to continue with the design of the program, looking at the curriculum offerings within the community colleges to identify what is missing, and developing more efficient educational pathways with mentoring and internships.

Items developed. Interviewees indicated that many POS elements currently in place had been conceived prior to the initiation of the green-focused POS TA program. However, these individuals also reported that steps were taken toward a more “fleshed out” format this year. Also, several interviewees indicated that the past year saw improvements in people’s concept of what a green-focused POS is, how a green-focused POS might be conceptualized, and how a green-focused POS might be used as a guidance tool to help students and parents navigate the decisions involved in career prep and selection of academic courses.

One member described the creation of a website with publications that offered guidance to help students, parents, and staff “materialize things into something that looks like a program of study.” One member indicated that two state-level rubrics were created as assessment tools for POS implementation. Although the original mandate was to focus on one area, the team members were aware of the development of seven individual POS through the consortium, aligned to the community colleges and customized at the district level. Finally, another team member indicated that members had been working within their groups to enhance opportunities for dual credits at secondary and postsecondary institutions.

2011-2012 plans. Many interviewees commented on plans for 2011-2012. One member indicated plans to work on “extending programs of studies, especially [in relation to] developing common core standards for educational learning.” Another member said that the team is continuing to look at materials from other states in order to refine their own implementation of the POS models. Additionally, a team member expressed hope that individual schools would work to infuse more “green” issues into their curricula and then work with the postsecondary system to facilitate continuing education. One member planned to take the “expectation tool” that was developed for program assessment to serve as a “standards” guideline, along with the continuous improvement model, to develop green programs further as an integral part of the educational curriculum.

According to one person, a goal is to deliver some Career Clusters materials in middle school in order to prepare students for dual credits in the future. Another interviewee described an infrastructure improvement dubbed “the cloud”:

A one-stop center for parents, educators, employers, economic development, so that we’re not siloed—our information of how we can be an asset in the entire relationship of what we’re creating here. If an organization is looking for students for internship programs and schools are looking for organizations, the state is creating a “cloud” where that infrastructure will be one portal of information.

Enablers

Interviewees indicated that the following elements had been helpful in the TA process to date:

- **The facilitator and the TAA:** The facilitator and the TAA both received positive reviews from the interviewees. One stated that the TAA included experts in what they do.
- **The team:** “I think that the team they brought to Washington, had we been able to have that team over the year, that would’ve been great because that was really a solid and strong team.”
- **The opportunity to work together:** Several interviewees indicated that the opportunity to work in teams supported success. Another person said that the “ability and the opportunity to collaborate across disciplines within a particular focus group was strong.” Another interviewee said:

Because of these team meetings, I think we were able to come out with an understanding that POS in manufacturing could have a green focus, because it was about energy, and it was about alternative energy, and it was about understanding what a smart grid is. We did very well.

- **Measurable outcomes:** One individual said, “A motivating factor was letting the individual participants focus their efforts on producing outcomes that could be measurable.”

Barriers

Barriers included:

- ***Focusing on non-green POS and other models:*** It was mentioned that at points during the process, the focus of the initiative shifted from the green-focused POS to a more broad look at POS in general, presenting several challenges.
- ***Lack of understanding of “green POS” in general:*** Some interviewees indicated a general lack of full awareness of what it meant to “green a curriculum.” They also indicated that with earlier clarification, members of the various constituent agencies might have experienced a smoother process.
- ***Time and financial resources:*** Several interview responses mentioned time and budget constraints, particularly in relationship to compensating the direct services staff. They indicated that it was hard to gain full investment in the project when people were already working at “100% capacity” at their own jobs, without the potential for a buyout of some of that time. Some believed that without funding, the development and implementation of POS, green or otherwise, would suffer or cease.
- ***Staff changes:*** Several interviewees mentioned changes in staffing from one meeting to the next, or over the course of the development process. One reported feeling that “once you are getting somewhere, and a new person shows up, you have to start over again.” Others noted that sometimes just getting everyone to the meeting on a consistent basis was difficult, which “disrupted the development process.”
- ***Coordination and collaboration:*** Several interviewees noted difficulty in coordinating partnerships among the various sectors (i.e., business, government, education). Some noted that aligning secondary and postsecondary curriculum was difficult as well, due to issues such as inflexible scheduling and policy.
- ***Relationship of state entities to local entities in a “local control state”:*** Some perceived that a statewide agenda, even though it appeared to advance education opportunities for students, could be perceived as a threat to local institutional autonomy.
- ***Limitations in the certifications for chosen industries:*** Some interviewees mentioned that certain fields (e.g., architecture and construction) lack easily stackable credentials and thus were difficult to align with OVAE standards for POS models in the schools.

Impact

Although some interviewees mentioned few classroom-level results, most were able to identify some effects of the green-focused POS TA program.

Positive impact. Positive effects included:

- ***Better organization and structure:*** Several respondents indicated that improved partnerships and collaborations between various sectors within the project were beneficial. Also, several respondents noted that policymakers better understood the demands they placed on the consortia and regional delivery systems when imposing policy mandates, thus improving relationships among the state, business, and education sectors.
- ***Continuous improvement model:*** Some respondents noted that their implementation strategies, including self-assessment and continuous improvement strategies, have improved the system.
- ***Perceived gains for the state:*** Members of the team described three major state-level gains: increased connection and collaboration, improved teamwork among sector constituents, and better understanding of how to put a POS into operation.
- ***Perceived gains for participating organizations:*** The respondents thought that their organizations could better cooperate with other agencies in implementing programs and better understood the challenges that other organizations face when implementing new programs. This led to an overall sense of improved ability to move forward with implementations.
- ***Leveraging the model:*** Interviewees said that lessons learned would allow them to move forward with plans for widespread implementation of POS models.

Negative effects. Interviewees mentioned several barriers and challenges, but did not specifically mention any negative effects of the POS and TA program other than increased workload.

Sustainability. Because the state moved away from green-focused POS toward more general POS, it may rely more on nontechnical assistance program funds in the future. Also, the state has planned some new initiatives that do not utilize the green-focused POS.

Unintended impact. One unintended effect of the program was improved understanding of the difficulty of coordinating efforts, particularly from the top down. Another unintended effect, according to one interviewee, was an increased sense of stature due to participation in a new, evidence-based, “cutting edge” project. A final unintended consequence was that some organizations and staff took “new directions” in their work. As one person put it, “I never thought we were going to end up in architecture.”

The Case of New Jersey

Background and Context

Roles of interviewees. Interviews about New Jersey's participation in the NRCCTE's TA were conducted with the facilitator, the state team leader, and six members of the state team. The team members interviewed included representatives from the New Jersey Department of Education, postsecondary education, and industry. Together, the New Jersey team created and implemented an action plan to develop a green-focused POS model.

Reasons for participating. According to New Jersey's proposal for participation in the NRCCTE's TA, a state-developed, green-focused POS model would create opportunities for CTE and also merge with a recently proposed \$33 billion investment in New Jersey's energy infrastructure. Some interviewees indicated that the green-focused aspect of the project was the major reason for participating. One team member further elaborated on the state's interest in a green POS model as follows:

The Council of County Vocational-Technical Schools had just formed a statewide advisory team to help guide their development of green programs of study... we had one meeting together prior to the announcement of the TA branch, so we thought it was a perfect fit for us.

Prior experience. Before participating in the NRCCTE's TA, the New Jersey Council of County Vocational-Technical Schools (NJCCVTS), which is the statutory entity representing the state's 21 county vocational-technical school districts, had already launched a statewide effort to develop new education and training programs to prepare students for green careers. The cornerstone of this initiative was a statewide Green Collar Careers Advisory Committee. For the first time in New Jersey, a statewide advisory board partnered with county vocational-technical schools throughout the state to develop short-term and long-range strategies to prepare high school and adult students for "green" jobs. As one team member stated, "We've been involved in many kinds of efforts around encouraging and assisting school districts and colleges and developing programs of study."

The team. Although 50 people were listed on the original application as possible team members, 11 core team members first met together in November 2009 with the TA facilitator. Much of the team came from the Green Collars Career Advisory Committee already in place.

The New Jersey team had strong representatives from various stakeholder groups. One respondent stated, "They had New Jersey Institute of Technology and the community colleges' representatives there and then you have the secondary county vocational school representatives at business and industry. We really did have a strong leadership there."

Technical Assistance

The NRCCTE's TA presented an opportunity for New Jersey to develop, at the state level, a that can be customized and implemented by any local district. Rather than a myriad of local or countywide advisory committees, a single Green Collar Careers Advisory Committee, with industry and educator representation from throughout the state, assisted the team by advising on specific aspects of the program.

The team met several times with the TA facilitator, who was described as “a really good facilitator in terms of helping us frame the question, keeping us on task, and so forth.” During the first year, meetings were held in November and April as well as at the national meeting in Washington, DC. At the March 2010 meeting, the committee identified an approach, selected pathways of focus, and restructured the team to focus on specific needs. “We went from a steering committee to a pathway advisory group. We kept the best and strongest and most active members of the steering committee and put them each in charge of a pathway advisory group.”

The steering committee had its last meeting in April 2010, and three pathway advisory committees met several more times over the next year.

During these meetings, the facilitator tried to make sure that all team members, not just a few, had an opportunity to contribute. He also helped ensure that meetings stayed focused and that the team's goals for the meeting were accomplished. The facilitator also made sure that experts were consulted as needed, both during the national meeting and at the in-state meetings.

We brought many experts into the team but we did use the resources that were available at the National Research Center meeting to feed some of the conversation, and I do think that was important. From the meeting that we had at the AED, they brought in experts from various fields and they were floaters; they kind of went around, they talked to people; they were available for appointments; that worked pretty well.

One member noted some emphasis on professional development: “We train teachers and are recognizing that there's a lot of work around this professional development that needs to go on... a lot of discussions now on how to keep the project maintaining momentum.”

TA objectives. Overall, team members said that the TA met many objectives, including an increased understanding of the POS framework and a somewhat increased understanding of the roles and responsibilities of different sectors. Barriers and obstacles to student participation in POS were not addressed within the TA. Some tools and strategies for states were provided, along with information about green-focused industries, but some team members thought that not enough of this support was provided. “It got us all to the table and it got us committed, but it really didn't give us a... map as far as how to do this... The piece that we didn't get from this whole TA process is the piece that we came looking for, which was the expertise on green.”

Programs of Study

New Jersey's Five-Year Career and Technical Education State Plan, approved by the New Jersey State Board of Education in March 2008, commits to implementing the POS model outlined in Perkins IV. The five-year plan requires all recipients eligible for Perkins funding to have at least one approved POS. The state's goal is to expand the number of approved POS.

New Jersey's POS are developed locally and submitted to the state Office of Career and Technical Education for approval. Curriculum decisions are made locally and must be aligned to the New Jersey Core Curriculum Content Standards.

Differences from prior efforts. A collaborative effort to develop a POS is a departure from New Jersey practice. Normally, each locally developed program of study must have an advisory committee whose members have substantive skills in and knowledge of the CTE program or POS. Rather than create myriad local advisory committees that might compete for the same key employers, NJCCVTS formed a statewide advisory committee to work closely with the TA team. Even so, school districts will be able to consult with local employers about specific needs and priorities to be addressed as the POS is implemented locally.

This POS model development is not the first effort to address "green" concerns in the school system. According to one team member, "Not a POS per se, but New Jersey supported the educational resource information center last year to develop a green curriculum for K-12 public schools, so we've been involved with the green curriculum conversation at the lower school levels for a while."

New Jersey has also previously focused on POS models to reform the education system. According to the team leader, New Jersey has about 50 different career academies, most of which meet the definition of program of study.

The primary difference between this POS model development and prior efforts is the use of a facilitator. According to one team member, "Just to contrast, that the other program of study I'm involved with, which is very similar to this, just without the green focus; but they don't have any facilitator. They don't have any technical assistance, and it really shows." One added difference associated with TA, according to one respondent: "It gave us some recognition, some prestige, some resources, but it didn't give us any money for any of these activities."

The role of the government. In the past, New Jersey state government has played a minimal role in developing POS for CTE. One interviewee observed that New Jersey is a "home-ruled state" where the community college sectors "basically do whatever they want." Given the collaborative approach of the green-focused POS, districts can implement it in their own ways.

Addressing local needs. Because of this collaborative autonomy, counties and school districts of New Jersey are very responsive to local needs. According to one of the team members, "I would say that our colleges... have very strong direct links with every district in their county."

Minimum standards for POS. Asked whether the New Jersey POS model would align with the OVAE-defined standards, one interviewee agreed that New Jersey’s green-focused POS:

- Incorporates and aligns secondary and postsecondary education
- Includes academic and CTE content in a coordinated, non-duplicative progression of courses
- Offers the opportunity for secondary students to acquire postsecondary credits
- Leads to an industry-recognized credential or certificate at the postsecondary level or an associate or baccalaureate degree

Model Development and Implementation

The green-focused POS is being built on the existing Green Energy Academy model existing college programs; it relies on existing infrastructure, other projects, and the session the New Jersey team attended at Washington, DC Three pathways are sustainable design, construction, and energy.

Timing. The Green Collar Careers Advisory Committee was formed in April 2009, and the team held its initial meeting in November 2009.

Reportedly, “the steering committee really had its last meeting as the steering committee in April of 2010 and then we had the three pathway advisory committees that met in July and November, and they just had a big meeting last week. It had everybody that’s ever been involved for a new meeting last week.”

Model development process (2009-2010). Developing a statewide green-focused POS was not simple and was described as follows:

We took a flying leap on this and said “If we wait until we have everything in place before we start this, we’re never going to start it.” It is very stressful, but in the end, I think that’s the way things work, the way things get done. We really took on a lot. It is very complicated.

While developing the action plan, the team decided to focus on three pathways. One team member said:

That is what the group decided was the best path. There was this open, brainstorming session to identify what the focus should be, where it should be. That was drilled down by the subcommittees for the three programs that we picked for energy, design, and construction. Then, there was a back and forth between those subcommittees to get consensus and buy-in. The process that was used was the most helpful thing.

Team members’ appreciation for the green-focused aspect increased with time. One member commented:

The students can't do green; it's a layer above the basic foundational skills and so that model was very helpful in terms of setting up those jobs, whether they're green or not at the end – the students will be prepared for any job in energy.

Respondents universally agreed that the process was bottom-up rather than top-down. One interviewee said:

I think it is more of a bottom-up because they have the teachers involved, and so I think the teachers from the districts that have agreed to pilot this are involved. So that they are not being told and given something... “Here is what you are implementing,” but they are part of that process.

Self-assessment. Interviewees did not say how the self-assessment was completed or used, although one interviewee noted that the self-assessment was conducted. “There was a process that we went through where we had, like the self-assessment and... that was part of the planning.”

Development for implementation (2010-2011). New Jersey formed a team of teachers with diverse expertise to develop a ninth- and tenth-grade curriculum with two parts, described as “a five-credit course class in sustainability and a five-credit exploration of the three pathways: sustainable design, green construction, and energy.” The team then brought this new curriculum to the State Department of Education, which provided financial support so that the curriculum can be piloted at six sites in the next academic year.

The state team also split into three groups, working on three POS for green construction, architecture and sustainability, and energy, respectively. These teams were working to develop each curriculum, although all three shared the same foundational curriculum. The facilitator spent the majority of his time during the academic year helping with the architecture and sustainability curriculum.

2010-2011 goals. The goal was to develop core content to address a range of industry needs and then to identify specific program options to meet the needs of particular regions or industry partners. The NRCCTE TA was expected to complement and support New Jersey’s CTE programs. To achieve this goal, the state faced a set of challenges including (a) needing buy-in from the community colleges and four-year institutions, (b) needing to implement a CTE POS in comprehensive high schools and vocational schools, and (c) continuing with creating POS and implementing them despite cuts of more than \$1 billion in state school aid for the 2010-2011 fiscal year.

Items developed. Important steps already taken include getting feedback from stakeholder groups, county vocational school leaders, community college academic officers, and employers and state leaders represented on the State Energy Sector Partnership Council. In addition, advisory groups for each pathway were created to expand involvement.

Some team members thought that much has been accomplished. “We’ve gained in terms of really enhancing the collaboration between partners, and the partners are certainly the secondary,

postsecondary, our business, our industry.” At least one team member, however, thought that curriculum issues had yet to be addressed. “We’ve got a high level structure, and we know what we want, but now, actually developing the exact programs that should go in year 2011 and 2012 is—we haven’t nailed that down completely.”

2011-2012 plans. The implementation of all three pathways was to be flexible for schools and colleges. In this sense, the expected goal for September 2011 was to provide a model with established linkages to postsecondary programs that county vocational-technical schools and comprehensive high schools could begin to implement. Beginning in September 2011, six pilot schools were to begin to use the model with ninth graders, continuing the next year with tenth graders. This summer, teachers at the pilot sites will attend a weeklong professional development session to learn about the new curriculum. At least one team member voiced reservations about this goal, stating, “I think the biggest obstacle was the concern about realistic linkages and measurable results.”

Enablers

- ***The facilitator:*** The facilitator was a key element in TA. All team members interviewed thought that the facilitator did his job effectively. “The biggest job was getting people to produce the deliverables, the outline and the content, and getting consensus on that. He did a lot during the meetings to facilitate those things.” “Things kind of gelled for us when we had the Washington meeting and that was really helpful, valuable, for us to spend an extended period of time together with a facilitator and sharing, as well, with other states; that really helped us get kind of focused in on what we needed to do.”
- ***Existing expertise:*** A key part of a green-focused POS is professional development. As one team member said, “One of the activities for the summer, the group is putting together a partnership with the state in mentoring and training for the teachers. Also, the expertise of the schools themselves will be instrumental.” Another team member commented, “There are seven vo-tech schools participating. Five of them are running the construction program, one is running design, and one is running energy. We’re going to see these POS courses get rolled out and implemented into the curriculum and observed, tweaked, modified.”

Barriers

- ***TA project delays:*** Although the team stayed close to the suggested timeline, there were some delays. According to one interviewee:

Having the team all understand what we were talking about in terms of a program of study, you know, we had folks that needed to develop common language and common purpose and that took a long time. And, of course, there were learning curves to deal with... The barrier of the unknown, we don't know what green is going to look like in the energy industry when you're providing energy, you know that... Well, you've got to provide a solar path, it's got to be either solar panel or wind. Well, guess what?

We're not ready for that here in New Jersey yet.

- **Resource constraints:** The state funding was cut more than \$1 billion for the 2010-2011 fiscal year, creating not only a challenge for the state, but a limitation on the implementation of the POS in schools. As one interviewee said, "Well, other than money, I hate to say it, but you know, people didn't necessarily have the resources... New Jersey is just crunched financially."

Impacts

Positive impacts. The following positive effects were noted.

- **Better collaboration:** Several interviewees commented on how the TA led to increased collaboration among secondary and postsecondary education, the state, and local school districts. One said, "I think it's turned around into an opportunity, and secondary and postsecondary institutions are working much more closely together." Another said, "It definitely strengthened the relationship between my organization and the State Department of Education because we're partners in this and we're both working really hard on it."
- **Better organization and structure:** One participant reported that the state now has a process and a model to follow.
- **Sustainability:** Effects on sustainability of the state team and environmental sustainability were noted as positive. One interviewee said, "If meetings can be scheduled to work within our personal constraints of time, I don't see any reason we would stop participating."
- **Perceived gains for the state and participating organizations:** A few interviewees reported that the TA will improve education for students and workplace preparation for employees.

Negative impacts. The interviewees mentioned none.

Unintended Impacts. The only unintended effect mentioned was time it took to do a good job, overall and in relation to the time frame of the TA. One interviewee stated, "I think that one of the things that we didn't realize from the onset is how much work this would really be to do this well; it really was a lot of work. It was not just simply to get together and get it done in one shot. It really takes commitment, a lot of work, and ongoing communication."

The Case of Ohio

Background and Context

Roles of interviewees. Interviews about Ohio were conducted with the state’s facilitator, team leader, and four team members. The interviewees included representatives from secondary education, postsecondary education, industry, and the state.

Reasons for participating. POS in Ohio were developed in response to Perkins’ funding requirements and a need for a connection between industry and education institutions to get more skilled technicians into the green workforce. Ohio saw the TA as an opportunity to expand its previous POS work into the green sector. Before the TA, one respondent described Ohio as always having been “very proactive when it comes to POS. It is way ahead in many ways, with a formal structure, ongoing in-services, followed up by a number of consultants.”

Ohio has the seventh largest population in the U.S., is ranked fourth in energy consumption, and has a high unemployment rate. These factors united to enhance the appeal of an opportunity to enhance the state’s green energy sector and create jobs. The green focus of the TA was also particularly relevant to Ohio because agriculture is its largest industry. The Ohio Soybean Council was especially interested because of its need for skilled technicians who are trained in biofuels, sustainable agriculture, bio-products, and bioenergy. Participating in the NRCCTE TA also provided the Ohio team with a chance to explore how green industries should and will fit into CTE within the state in the future.

Prior experience. All of the interviewees said they had some prior experience with POS or movements similar to POS. Another said that although Ohio already had aspects of the POS in place, the state director thought participating in the TA would provide a good opportunity to develop and improve those components.

The team. One interviewee indicated that the Ohio team included more than 30 people; per the TA grant, they represented industry, business, and postsecondary and secondary educational institutions. The Ohio team was described as a “very comprehensive group of what I would call some of the top leaders in CTE.” It was also described as “almost too big.” The state leaders’ reasoning in forming such a large team was to create three POS focused on energy, bio-products, and sustainable systems. In reference to OVAE’s 10 elements of POS (OVAE, 2010), one interviewee noted that no members of the team worked at the legislative or policy levels. Another interviewee thought that there needed to be more business representatives.

Recalling the team-building process, one team member said:

I think knowing now what I think I’ve observed, moving forward I would really spend more time up front forming that stakeholder project group, for not only content, but also for state alliances. I think the state leader attempted to do that, but I think he was really focused in getting the industry reps at the table, and he did a really nice job of that. But to really develop a program of study, as I understand it, the industry partners are critical from a content validation

standpoint; but the program of study really lives as a pathway from secondary to postsecondary, so really making sure you have the right players at the table.

Technical Assistance

Ohio's technical assistance consisted of facilitated meetings, including two in-state meetings, the TAA in Washington, DC, and the Career Clusters Institute in Denver during 2009-2010. No technical experts took part in the in-state meetings because the state leader thought the team had enough expertise and sought to focus on the team objective, to "build a stronger alliance between secondary, postsecondary, The Ohio State University, and industry."

Interviewees perceived the facilitator as "very beneficial," as one put it. One interviewee said the facilitator was with the team through the whole process and said he or she "would like to very much work with him again." The facilitator was reported to have had a "wealth of knowledge" that was instrumental to the team and to have "helped us to understand the process," especially team members who did not have an education background. One interviewee especially appreciated the facilitator's perspectives from other states, that helped the team think at a higher level. The facilitator was reported to have kept the team moving and asked questions that helped the team "think outside of the box" and to "think about what you're actually doing." Another interviewee said, "It kind of refocused and allowed the team to think on a higher level in some ways in terms of what was absolutely essential as it relates to programs of study." This person thought this would not have happened without the facilitator. Some interviewees found that having an outsider serve as a facilitator was very beneficial because the facilitator offered different perspectives and thought-provoking questions.

Team members especially appreciated that the facilitator "helped keep us focused." One interviewee said:

When you have so many strong people with agendas and goals and they have very clear ideas of what they want, then it is hard, I think, to gather around something that is a joint mission maybe and everybody, as you know, has their own. I think the thing he was able to do was remind us of what we were there for and keep us on target as far as to consider the goal all the time. I felt I knew what our task was. And so that's really an important idea. He was really helpful in that, and I think that we needed that as a group, as a group that was critical. Somebody from the outside, not even the Ohio Department of Education person, was able to corral everyone as well as this guy was.

One year was thought to be a very short time to get everything done, although respondents reported that the facilitator did everything he could within that time frame. During the 2010-2011 academic year, the facilitator did not interact with the state leader because the leader was working with teachers to implement the previous year's work in the classroom. The facilitator was planning one meeting with the state leader in the next few weeks to do a debriefing and identify any existing needs the team had. When reflecting back over the process, the facilitator said he wished he had "done a better job of staying better connected with the state leader, and

maybe becoming a little bit more proactive, than becoming too accommodating than to stand back and be respectful of the state leader’s approach.”

In terms of the support the facilitator received, he said:

[The facilitator] did really an outstanding job of providing each of the facilitators with the jobs and tools and resources that were at our disposal, and then allowed us to take that array of materials and customize it, if you will, to the unique features within each state’s project.

Additional assistance. The only support Ohio received on the project was from the NRCCTE TA.

TA objectives. When asked whether the objectives of the NRCCTE TA project were achieved, interviewees generally indicated that the team had an increased understanding of the POS framework, especially in terms of the similarities and differences between Ohio’s framework and the national framework. However, interviewees’ opinions varied widely when questioned about particular objectives.

One interviewee reported that many meetings did increase understanding of the roles and responsibilities of different sectors; another said, “I don’t think that was an outcome that we observed.” When asked if the TA helped in addressing barriers and obstacles to student participation in POS, a respondent did not think that the objective was relevant. When asked if the TA provided the states with tools and strategies, one interviewee stated, “The team created their own strategies, because in the end it came down to working locally in terms of coordination, working with people, correspondence, everything.” Another team member appreciated the supply of specific strategies and tools. Asked whether information was provided about green-focused industries, one interviewee reported it was “substantial.” Another said that the team was provided with a good deal of information on green-focused industries at the Career Clusters Institute in Denver.

Programs of Study

The characteristics of POS are identified at the state level, and how the POS are developed and implemented is dealt with at the local level. Ohio was not looking to create new POS but rather to examine existing and potential models to determine how future POS might look. The team reported a futuristic approach, “looking at ‘what are the trends’ and ‘what can we include in those programs that would be in some way transferrable,’ or ‘what could be adapted to other regular non-green-focused POS.’”

Differences from prior efforts. The new POS development was reportedly similar to the previous program development efforts, because Ohio used its preexisting POS model as a guide in the development of the green-focused POS. The new model was described as having “refined the work that was initially in place.” The TA process allowed the team to refocus and:

Think on a higher level, in some ways, in terms of what was absolutely essential as it relates to programs of study. It was a very refreshing project, I would say, in the sense that it allowed everyone to think out of the box... It really let us, in general, to think differently and to move beyond what we had. Because, you see, what happens when we are evaluating ourselves is different than when we have an external person that is needed, who can provide examples from other states, can raise the right questions, so that we can really decide whether, "Hey, this is the latest" or "This is more of the same that we're re-engineering" so to speak. Or "are we really transforming or developing something new?" I think that alone really led for interesting and higher level discussions that otherwise wouldn't have happened.

Because the focus was green industry, some content standards differed, and an analysis of the industry was required. One respondent reported that the information used to develop the POS was more empirical and current in nature than in previous efforts.

The process of moving the Ohio model to be more in line with the national model was described as awkward, because Ohio has:

Career centers that have noncredit certificate programs. We do not just go secondary to community college. We can go secondary, to adult workforce, to community college. And so, the adult workforce and community colleges have been a first for a long, long time in the noncredit arena. And now, with programs of study we're trying to pull that together into a smoother system for participants.

POS in Ohio differ from the national model:

The template for Program of Study has been to date one that is a Tech Prep model that does not include adult workforce development. It can, but the template does not actually allow for that noncredit certificate arena. So, while the Academy is helpful and the whole initiative is helpful, we have specific needs in Ohio that don't fit any of the current templates or models that are out there. So, we have to realign what we do in Ohio a bit to build in the certificate part.

Another challenge in Ohio is integration of certificates, because the green sector and its degrees and certificates are still emerging. One interviewee reported that it is challenging to incorporate the changing degree and certificate component into the structure of a green-focused POS.

The role of the government. The role of the state government was described as facilitating and guiding the local institutions in creating POS. The government also monitors local institutions for compliance with funding guidelines.

Addressing local needs. In Ohio, standards for POS development are set at the state level and developed locally.

Minimum standards for POS. When asked whether the Ohio POS model would align with the minimum standards for POS as defined by OVAE, interviewees indicated that Ohio's POS:

- Incorporates and aligns elements of secondary and postsecondary education.
- Includes academic and CTE content in a coordinated, non-duplicative progression of courses.
- Offers the opportunity for secondary students to acquire postsecondary credits, when appropriate.
- Leads to an industry-recognized credential or certificate at the postsecondary level or an associate or baccalaureate degree.

Model Development and Implementation

Timing. The facilitator reported that an initial model existed at the end of the 2009-2010 academic year, after the second in-state meeting in Columbus.

Model development process (2009-2010). One interviewee said: "The idea was to develop those programs of study so that they set an example for others; so the idea, the objective is that you can keep expanding it, that's an object to grow, because we have set as a state goal, to have 100% of programs with programs of study particularly focused on Tech Prep."

The model development process was described as "open-ended. They didn't have a specific piece you had to do. They wanted us to come up with models that you could use, so it was pretty open-ended as opposed to ones we worked on before." The Ohio team divided into three different groups, focused on three different green areas (energy, bio-products, and sustainable systems) and tried to retool an agricultural model to fit within the contexts of a green-focused POS. One interviewee thought that retooling the agricultural model was unsuccessful.

The model development process was different from that of other POS due to the green focus, requiring work on content standards and analysis of the industry. Because the green focus was new to Ohio, the team struggled to establish a common understanding and put the concepts into "tangible language." The facilitator reportedly contributed in this area by promoting and establishing a common language; during initial discussions, team members had often talked past one another. After content standards were established, a general model was created. Next, articulation agreements were created by bringing in partners who helped identify where the linkages are in the POS model and then created agreements that "formalize the courses that you set in sequence so students can get credit from another so it is quite easy once you've done the POS work." The state leader plans to take the work that resulted from those three meetings to teachers, so that the new standards can be integrated into the curriculum for the next school year.

Self-assessment. The state leader reported that the self-assessment (MPR Associates, Inc., 2010) was conducted with input from the postsecondary and secondary institutions. One interviewee reported that the assessment was completed by the state leader and then validated by the team. Another interviewee was not a big fan of the self-assessment, saying it was difficult to respond as a group, because a local educator might respond differently to a given question than would a state-level educator.

Development for implementation (2010-2011). Ohio finished the alternative energy model that required secondary and postsecondary collaboration. Reportedly, the model has “value and can be used across the state to give more rigor and continuity to our programs, giving pathways that kids can see.” The state leader was then planning to take the work that resulted from the previous year and meet with teachers in the summer to have them begin to integrate those standards into their curricula.

2010-2011 Goals. The goals were to continue the work that occurred in the 2009-2010 academic year:

- Identifying standards that could be infused into program areas using the POS model within agriculture
- Moving those standards to the Ohio classroom teachers to incorporate into their instruction
- Building a stronger alliance between secondary, postsecondary, The Ohio State University, and industry
- Developing a course of study and articulation agreements

Items developed. The following items had been developed at the time of the interviews:

- Many articulation agreements
- An alternative energy POS model
- Curriculum alignment
- Course sequences

2011-2012 plans. The plan for the 2011-2012 academic year was to continue to use the POS model to develop two other pathways in energy and bio-products. These models would be designed for local use and could be altered to meet local needs. Additionally, the state leader planned to work with teachers in professional development activities to encourage them to begin integrating concepts from the new pathway into the classroom.

Moreover, participation from The Ohio State University was seen as a must in this process, although the representatives from the university who participated in the project were instructors and thus could not speak for or make any decisions on behalf of the institution. One interviewee reported that, “We cracked the door open, and it’s just going to take more time and more relationship-building between the Ohio Board of Regents and The Ohio State University.” The state leader was going to continue trying to work with the university to see if more progress could be made.

Enablers

The following helped the TA process:

- **Diverse stakeholder group:** The model development meetings brought together a broad-based stakeholder group that helped generate a lot of different ideas and provided buy-in, support, and validation of the newly formed POS. One interviewee went on to say, “We had the secondary, the postsecondary, and the ODE [Ohio Department of Education] in the room at the same time, and we went through the process. That was real valuable.”

- **Interest level of state team:** One interviewee said, “The particular strength is the amount of interest in the meetings that were convened. At first there were probably, I don’t know, 30-40 people there, which I think is a good turnout: industry and education people both who are interested in these topics who recognize it as important for Ohio’s future. And so I think there was lot of interest. So I think that’s really a big benefit.”
- **Facilitator:** The other team members perceived the facilitator as “very knowledgeable” and as having validated what the group was doing, proposed interesting questions that helped the group think in new ways, and kept the group on track and moving forward. One interviewee said the TA was valuable for the state because of the current leadership and that without the TA, the current leadership would not have been able to manage the group as well and less progress would have been made.
- **Technical Assistance Academy:** The TAA was reported to have had:

Excellent speakers and some real innovation, and there was honesty about how to go about it. I think that was most encouraging. Then you’d have some breakouts where you could go and reflect a little bit and reflect without the day-to-day interruptions, and I think that was extremely helpful. Plus the fact that it was very high powered... I mean there were a lot of very prominent people there, people who really cared. We had one really good kind of deep discussion about measuring people in pathways. There were a lot of good discussions with people in high places, and we appreciated that.

Barriers

Barriers were also identified.

- **Turnover and lack of consistency of stakeholder group:** Although one interviewee noted that the state leader could not control this, turnover of supporting staff at the Ohio Department of Education substantially affected the momentum of the project. Similarly, some people consistently participated in the project, but the industry representatives tended to rotate, so at each meeting, it took time to get these new participants up to speed.
- **New concept:** One interviewee found the integration of the certificate aspect of OVAE’s POS requirements into the green sector difficult because degrees and certificates are still emerging in this relatively new area. Another interviewee stated,

Programs of study were fairly new kinds of concepts. So when you take a fairly new concept that’s coming out of Perkins and you try it with an emerging area of industry, I think you get a double whammy at the same time. And that is not an excuse, but I am saying that sometimes people aren’t sure of the task and that can be a stumbling block.

- **Time:** Team members reported that the short time frame of the TA was a barrier to accomplishing everything they wanted done.
- **Leadership:** The state leader was described as very focused on a specific agenda, and one interviewee thought that this hampered the productivity of the team meetings. As will be discussed below, the state leader has not informed any members of the team on any of the progress that has or has not been made, leaving one interviewee to question the leader's ability to communicate effectively with the team. Additionally, based on observations, one interviewee thought the TA should provide state leaders with training on how to use a facilitator most effectively.
- **Closure:** At least three interviewees reported that lack of closure and knowledge of current events related to POS development hampers evaluation of whether the process was a success and hampers continued work on the remaining two models. Most participants indicated interest in continuing to work as part of the state team, but they have not heard from the state team leader. One interviewee said, "I don't know that programs of study have been written, I don't know if there have been articulation agreements created, I don't know how any of that turned out, which is kind of a disappointment."

Impacts

Some impacts have been realized, although most interviewees were unaware of them because the state leader has not been in regular contact with the team since a model was created.

Positive Impacts. Positive impacts included the following:

- **Expedited progress:** The state leader thought that participating in the TA allowed the state to create green-focused POS more quickly than if it had gone through the process on its own.
- **Different perspectives:** Having conversations with other states and being exposed to different perspectives reportedly influenced how the team approached the project in a positive way.
- **Formal process and structure:** The formality and structure that the TA brought to the process of developing POS was seen by one respondent as a positive effect.

I think if it had just been a traditional grant-funded project, "Here's money, go forth and do good work," there would not have been a focus on a well-defined set of outcomes. I think the TA structure around this has helped keep a focus on what the outcomes of the project are.

- **Stronger relationships:** Relationships among the secondary, postsecondary (specifically The Ohio State University), and other educational institutions have been strengthened.

- ***Sustainability:*** The state leader plans to create two new POS within the next two years. Many interviewees indicated a willingness to continue working with the state team, but no interview participant had heard from the state leader in at least six months. Ohio does have consultants (independent of the TA) who have been assigned to the various career fields, and it is their responsibility to continue this work.

Negative impacts. The interviewees mentioned no negative effects.

Unintended impacts. Reportedly, all the team's accomplishments were within the scope of the original expectations. However, the way in which and the extent to which the goals were accomplished differed from initial expectations.

The Case of Oregon

Background and Context

Roles of interviewees. Interviews about Oregon were conducted with the state’s facilitator, team leader, and three team members, including one representative each from secondary education, postsecondary education, and industry.

Reasons for participating. Generally, POS were developed in response to Perkins funding without the TA project. As a result, there is “a lot available in CTE.” The statewide focus of the POS TA project mattered to the Oregon team because numerous POS are developed locally. The TA project allowed a more systematic effort that attracted team members to make use of their roles and positions within the state of Oregon. One interviewee stated:

We have been asked to develop programs of study, and it seems like we were duplicating that over and over somewhat... one region to the next. . . so it made sense to develop what we intend to use as a model in our state for how we could do a statewide program of study.

The green-focused aspect was of interest because green building had been a direction for industry and a priority for the state. One of the partners thought that their organization was an obvious choice for this project because of their position and influence within the state.

Prior experience. Most interviewees indicated prior experience with movements similar to POS (e.g., articulation agreements via National Science Foundation projects, pathways, and career pathways) and corresponding TA. As a result, many team members knew each other before the project and had worked on aspects of POS. One team member stated, “The program of study just seemed to be an elaboration of the pathway project.” Previous technical assistance, however, did not resemble the assistance provided by AED, but was in-state collaboration and state-level support.

The team. Oregon’s state team was described as “well-balanced” and “strategically chosen.” One interviewee indicated that the team had 10 people as “dictated” by the solicitation for the grant. Team composition changed from the original team presented in the application to the actual implementation committee.

Technical Assistance

Oregon’s technical assistance consisted of facilitated meetings, including in-state meetings, the TAA in Washington, DC, and the Career Clusters Institute in Denver during 2009-2010. In-state meetings involved technical experts in education, not in sustainability or environmental sciences. During the TAA, the facilitator arranged opportunities for the Oregon team to meet with the New Jersey team because of “some parallels between some of the things in the New Jersey group and what the Oregon group was interested in.” This exchange provided insights that the team might not have had otherwise. Furthermore, the facilitator was able to refer Oregon team members to

grant opportunities provided by the U.S. Department of Education via OVAE (i.e., the I3 competition).

The Oregon team had planned to invite experts, but ended up not utilizing expertise in green building and POS because of limited funding. Reportedly, the facilitator had not met with the Oregon team since the Career Clusters Institute:

We didn't get word whether or not we were going to have continuing funds until almost January [2011], so there was no follow-up... I suspect the people have gone on doing their own thing, and it isn't just at the top of their minds or agendas right now.

Nevertheless, the role of the facilitator was perceived as “useful” and “fantastic,” and the meetings were described as “productive.” Overall, team members described the facilitator as “excellent.” “She really understood what was going on and she had a lot of diverse thinking... so we could finally come up with something.”

One team member was surprised to learn that Oregon had a TA facilitator, and another team member indicated that the facilitator only attended two of four planned meetings. In one of these meetings, another NRCCTE TA facilitator substituted for the Oregon facilitator.

Another team member said, “A lot of the stuff we have to deal with is internal stuff, so it is hard to say what a facilitator would do for us.” Nevertheless, the facilitator “kept in touch” outside planned meetings, discussed details regarding the meetings, provided feedback on surveys, provided insight and perspective regarding meeting agendas, and helped organize the thinking overall. One team member indicated that much of the facilitation focused on standards and articulation.

The facilitator felt “fortunate” that Oregon “really had their act together” and thought that the state “could have progressed without” the facilitation and, in fact, likely moved forward in 2010-2011 without facilitation, because the team leader “knew all the participants in the process [and] had done a good job of setting up the team.” The facilitator helped the process by asking the team reflective questions and stimulating ideas.

Team members described the facilitator as a “guide” who “facilitated meetings, led discussions, shared with us what some of the best thinking was, and helped us to develop a plan and an organization.” One interviewee said:

She was very good at knowing, especially the Perkins rules... she was very good at understanding what the rules were and where we needed to focus our efforts in terms of what funding, what could happen in terms of maintaining a sustainability, not in the terms of green, but sustainability in the terms of longevity and how to perform in that manner. And I thought that was really invaluable.

Team members appreciated the TAA and the presenters from the U.S. Department of Education and from AED. One team member said:

I was very impressed. I had no idea. I had not heard of them [AED] before, shame on me, but I guess behind the Red Cross they're the second largest or third largest not-for-profit in the country and they do consulting all over the world.... so I was very impressed with that.... then we had a number of meetings with them and other members of AED, and they were all crackerjack.

Technical assistance is also taking place to facilitate implementation. In essence, the POS development team is providing standards-aligned resources and structures so that curricula and curriculum resources can be developed and professional development can be provided. Moreover, extensive work has been done “in helping CTE teachers to develop and integrate academic content into criteria.”

Additional assistance. In addition to the NRCCTE TA, the state of Oregon provided some internal resources to support the project. Moreover, some people “just gave up their time” for the project. One team member indicated that one school receives financial support from a green-building consulting firm, which also helped with integrating “green building” in the science curriculum.

Technical assistance objectives. Asked whether the objectives of the NRCCTE TA project were achieved, one interviewee said that team members better understood the POS framework and the roles and responsibilities of different sectors. The TA also helped address barriers and obstacles to student participation in POS. However, the TA did not provide tools and strategies for states. Rather, it helped to identify what these tools and strategies might be. In terms of the green-focused content, many resources were available within the group and the state, eliminating any need for additional information on green industries. One interviewee said:

It wasn't an area where we needed a lot of input. We had a presentation at the meeting in DC, and most of those things were about green; and we were way beyond that, as the state had such a strong green initiative.

Programs of Study

Oregon's POS model is based on standards rather than courses, so courses in individual schools can be examined in relation to the standards to see whether they fit within the POS. At this time, Oregon is still working to implement the green-focused POS statewide by introducing statewide articulation. To date, community colleges in the state tend to work independently, so they need to get involved one by one. Moreover, Oregon intends to manage the POS through the consortium with its industry connections, rather than through its Department of Education. Members think that involving secondary, postsecondary, and industry partners is very important for statewide POS in Oregon.

Differences from prior efforts. The new POS development process was described as very different from previous program development efforts, because it was perceived as a “good model” that just needs to be adjusted for a new context. One interviewee said:

With this particular one, we started with a blank slate and identified the standards, and the business areas, and the labor areas. The community college, university level, the state, and the high schools were all working on this, and we came up with a good set of standards. And the rest of the pieces of the program were developed from there out.

The new model differs from prior efforts because it was intended to be implemented statewide through a consortium, whereas prior efforts focused on local development and implementation. It was also perceived as more efficient than previous efforts; it increased consistency in the standards, and its structures helped reduce the amount of work each institution would have to do in developing its own model.

The role of the government. The state government handles quality control, including approval processes for individual programs. Otherwise, local education institutions are encouraged to work with the consortium or join the consortium to ensure that local programs are aligned with business needs in addition to the educational needs.

Addressing local needs. To address local needs, standards are being identified locally. Moreover, information on professional development opportunities from business leaders is shared with the locals, requiring a lot of coordination. Resources are scattered and need to be identified to pinpoint and prioritize local needs.

Minimum standards for POS. When asked whether the Oregon POS model would align with the OVAE-defined standard, members agreed that Oregon’s green-focused POS accomplished these items:

- Incorporates and aligned secondary and postsecondary education (i.e., it is a “prerequisite” and “an absolute requirement”).
- Includes academic and CTE content in a coordinated, non-duplicative progression of courses. Specifically, “Non-duplicative, since we don’t do courses. We align standards. What we are looking at is a non-duplicative series of standards. When standards overlap that’s when articulation takes place.”
- Offers the opportunity for secondary students to acquire postsecondary credits, when appropriate.
- Leads to an industry-recognized credential or certificate at the postsecondary level, or an associate or baccalaureate degree. The specific definition for Oregon is:

To have postsecondary and secondary alignment with a program at the community college that leads to a 45-credit certificate. So that’s an absolute requirement. All of those are industry recognized just because the nature of how they had to be developed at the community college level, but standard certification depends on what is available within a program’s

particular content area. Some content areas have industry-produced certification, and some do not. So that isn't an absolute requirement. But it is an absolute requirement to be aligned to a program that has a degree or certification that has 45 credits or above and that was chosen primarily because of the rules in Oregon. The certificates, 45 credits or above, have to include general education, including math and communications. It goes back to that integrated academic component.

Model Development and Implementation

Timing. An initial model existed at the end of 2009-2010. The model development was to be finished at the end of the summer for initial implementation in the fall.

Model development process (2009-2010). The model development process was described as “the ability to have an outside party to help us to have some discussion” about a green-focused POS of construction. The TA focused heavily on standards, and initially on articulation, to some degree. The standards were to set the foundation for all green-focused POS in the state. The TA helped the team with structuring and dividing the work and getting to the appropriate level of detail. In Oregon, content and focus areas were available, but the question of how to make the POS statewide remained.

Furthermore, the model development process was described as “bottom-up,” corresponding to the “historical culture” of the state. One interviewee expressed that it was a combination of bottom-up and top-down processes: “It probably would not have happened if we did not take a role in it; so there is the top-down.” Curriculum and standards development would be bottom-up. In addition, the need for a statewide POS stems from the field... the response to the need to do “something more coordinated, more statewide, or more regional” that is “a top-down response to a bottom-up problem.” Also, it was emphasized that:

Oregon is very much a local-controlled state, but nonetheless they are very good at designing systems that they encourage people to use. So I wouldn't say that it's dictated from on high, but they create a lot resources, online resources—some of the best I've seen in the country—and then they encourage people to use those, but they don't mandate it to the same degree as it might be in a more centrally governed state.

A top-down only process would likely not work in Oregon.

One team member was unsure if a green-focused POS model had been developed. The same team member thought that multiple models coexist with the ongoing statewide effort.

Finally, one team member described the process as “the most comprehensive and intensive effort that I've worked with on a program of study,” because this effort is intended to be statewide and involved a “high-power group” with an “incredible amount of knowledge and influence.”

Self-assessment. The self-assessment (MPR Associates, Inc., 2010) was individually or collaboratively filled out, depending on the choice of the team members. Afterwards, responses were aggregated for discussion by the team. Key points for the facilitated discussion were “Where we were and what did that reflect, you know, ‘How prepared did we feel in that assessment,’ and then, ‘What did that suggest for us as a team?’”

Development for implementation (2010-2011). In 2010-2011, the state team held a few meetings, but generally progress was slow for several reasons (e.g., the state’s economy and limited TA). In essence, a structure for implementing the green-focused model statewide was missing. Progress further decelerated because the TA was limited. Team members thought that it was not clear whether the state had a facilitator until more recently (Spring 2011), although the facilitator kept in touch with the team leader. Some remaining funds were used to hire a professional to help with curriculum development and populating the website.

The need for a facilitator was limited in the second year, because “the group is mature enough to work with each other” and meetings could be held without a facilitator. Nevertheless, the state leader did not want to give the impression that all work was completed. “We are still working on that.” Much remaining work involved unique policies and relationships in developing the statewide implementation model. One team member indicated that the POS was implemented in part, but the leader stated that the model was not yet implemented at the school level.

2010-2011 goals. Only a few of the expectations and goals for 2010-2011 were realized (e.g., the website, initial test implementation of the Sustainable Building POS in a high school). All original goals for the project were accomplished, but the marketing, communication, and advocacy for the model was not as extensive as expected. One completed goal, a set of standards, was made available on Oregon’s website. Those standards indicate “what people need to be teaching to have ‘sustainable building.’” Other goals, such as completing statewide articulation agreements and developing a technical skills assessment, were not achieved.

Items developed. Materials development in 2010-2011 included focus points, learning content, requirements for continuing to the next level, and requirements for receiving high-school credit for college-level courses. Little curriculum was available for green buildings, and the team provided a website with green-related resources and standards for curriculum development, professional development, and structure-building. Additional work includes:

- A Board of Education-approved statewide green certificate
- A consortium of 10 people to accept schools, set requirements, write by-laws, provide a matrix, and provide instructional support

Schools were to “address the standards and provide course listings and complete a road map of the POS.”

2011-2012 plans. One interviewee noted that the “bureaucratic part” of the POS should be finished by the summer 2012. Then the model will go to the schools for a final consortium agreement. Thereafter, schools can begin to implement and identify needs. The POS team was to:

- Complete the technical skills assessment.

- Complete statewide articulation agreements and transfer options.
- Align curricula between K-12, community colleges, four-year colleges, and apprenticeship programs.
- Develop a professional development plan.

Enablers

These elements aided the TA process:

- ***The facilitator:*** The team perceived the role of the facilitator as “useful” during the model development process. Team members appreciated the opportunity to have an outside party facilitate group discussions.
- ***The state leader and the team:*** Oregon benefited from a strong leader who put together an appropriate, diverse team. Reportedly, team members included people from Portland State University and Portland Community College, high school representatives, a charter school representative, state-level people, and environmentalists. One interviewee said, “Positive was having the right people at the table and be able to have good solid discussions about what the program of study was, educating others that weren’t very familiar with it, what a program of study really is.”
- ***Existing expertise:*** Expertise in and experience with green-focused content was another reported strength.

Barriers

Problems included:

- ***TA project delays:*** Interviewees indicated confusion about the continuation of the project in 2010-2011, due to issues at AED and reductions in original budget plans. However, one also mentioned that AED “tried very hard to keep things moving.”
- ***Resource constraints:*** Due to budget constraints, the Oregon team neither invited additional experts in green-focused content and POS nor initiated a communications campaign about POS and CTE. The weak economy was named as another barrier.
- ***Time:*** Team members perceived the TA project as a one-year project, hampering continuation. One member said, “The work came from the committee and that was good, but we didn’t do a very good job of getting it to the closest level to the classroom.” Another member stated, “We accomplished quite a bit for being together the short amount that we did, but it felt like we were really just getting our feet on the ground and the year was up.” Another interviewee noted, “We tried to do everything in such a compressed time frame because even defining what the principal components of a program of study were didn’t happen until almost the end of... like I said, it would have been 2009, and we were already into our technical assistance at that point. And then, we had to be done by June. I mean I think it was a flawed design.”

- **Local characteristics.** One team member pointed to the difficulty of developing a statewide program in a state like Oregon with few colleges, many rural areas, and a culture that is historically locally bound. Colleges make their own decisions, and many institutions do not have mechanisms in place to report necessary data.

Impacts

Interviewees suggest little impact to date, but they assume that change will emerge when the model is implemented.

Positive impacts. The following positive impacts were noted.

- **Better communication across the state:** “so people have a much better understanding of what is necessary if they want to go on to technical study at a two-year or four-year institution... It’s creating a stronger relationship across the state in terms of all people who study in this particular POS. . . It is certainly aligning itself with providing a direct pathway for students to enter NRCCTE programs from areas outside of just directly in PCCs district. Then, last of all, just it creates a better sense of community for everyone because we need these people in the CTE.”
- **Increased interest:** “There are side benefits from this work because there’s a bunch of other agencies and other groups that have been doing green work. They have suddenly seen how K12 education could connect into their work. So we have been invited to participate in various other projects as sort of consultants... Prior to this, there was very little of that.”
- **Better organization and structure:** “The mandate on programs of study helped us better organize our courses and the next steps for our students because we want all of our students graduating... to go on to postsecondary education or training. So what the next steps are has been illuminated by the program of study.”
- **Sustainability:** All interviewees committed to continuing the work, and Perkins funds will be allocated “to developing programs on a bigger scale.” One interviewee noted, however, that it is unlikely that the whole state team will continue working together. “It’s not a standing community per se, but they all knew each other, they liked each other, respected each other; they will come together in different settings—I mean, in different types when a need arises. I would be surprised if they met together unless there was some specific reason for the same purpose. But they will continue to work together on related projects.”
- **Perceived gains for the state:** Team members reported that people were very receptive to the notion of a statewide model, a quality product that can be used throughout the state and at the same time save resources for developing local models. Moreover, the state would be “staying on a leading edge, on a cutting edge, on some of the latest trends,

especially in terms of CTE which often gets the shaft.” Furthermore, the project allowed members to “formalize some things in terms of POS for better pathways.”

- ***Perceived gains for participating organizations:*** Participating individuals thought that they and their organizations learned from one another, making new connections. Some individuals also appreciated their organizations’ inclusion and saw the project as good marketing.
- ***Leveraging the model:*** Interviewees believe that the POS model may spread, because it is the only statewide POS. As other disciplines (e.g., agriculture, automotive) begin to develop POS, they may look at the green-focused POS as a model to replicate. Replication is a goal of the initiative. One interviewee pointed to the website and said others “are using the POS model for a wide range of different kinds of curricular innovations.”

Negative impacts. The interviewees mentioned none.

Unintended impacts. Only two unintended consequences were reported. First, the amount of work in relation to the time available was underestimated. Second, connections were established to groups that do similar work around the state.

Appendix C
State-Level Case Studies: Nonparticipating States

The Case of California

Background and Contexts

The team from California did not participate in the green-focused POS TA, despite four original reasons for the state to participate. First, participation was intended to reinforce the skills and abilities of the potential participants. Second, the state hoped to develop standards and training plans for future green-focused programs. Third, improving green-focused programs was intended to anticipate market demands for green-skilled workers. Finally, California has a large automobile manufacturing sector, with a high demand for green-skilled workers, particularly in the area of alternative energy and fuels. Despite not being selected, California has continued to develop POS within its academic system.

Roles of interviewees. Interviews in California were conducted with five team members from sectors including educational administration, school faculty, and industry. In addition to their roles in the team, some interviewees also worked as liaisons between institutions and business sectors. One team member reported working as a liaison between a secondary school and the local community college. Another member was responsible for the California Partnership Academies and management of the Green Academies.

The team. The POS implementation team consisted of members from the California Restaurant Association Education Foundation (representing business and industry), the construction industry, Cypress Community College, ROPs (Regional Occupation Programs), independent groups that worked with utilities, and utility companies such as Sacramento Municipal, Pacific Electric & Gas, and the utility commission. Additionally, members of the various sectors formed curriculum and program advisory panels throughout the reporting period. Finally, an external consultant group was hired to help write the curriculum for the partnership academies.

Reasons for participating. When asked about reasons for participating, two interviewees did not know the reason for applying for the grant, because they had not been involved in the grant process. Three members of the interview group did know the state's reasons for participating in the green POS TA. One member said:

I assumed that the assistance was so that we could develop the logical sequence of courses for any particular industry sector, start to look at available curriculum for those sequence of courses, try to find a myriad of options, look to see what teacher requirements would be available, and start on teacher training so it's all a domino effect.

Another member said:

I think the reason I was interested in this was that we had two environmental pathways in our school district and I have been involved with them, and I thought "Good." Somehow, my name got up to the state and the state contacted me and said, "Would you be willing to join in on this grant?" And I said, "Sure."

A third member said, “So my understanding of why we went after it was to help recruit and strengthen our program of study structure and to help realign to kind of what the national standards [are] and thinking [was] going.”

According to background sources, the state of California must submit a state plan for POS as part of its funding requirements. The state also sought to provide pathways to link secondary and postsecondary education, help students develop skills that are required by prospective employers, and improve its own components and knowledge base.

Prior experience. A major experience with POS in California was the California Partnership Academies. These academies, primarily for at-risk youth, featured an academic and career tech component. One interviewee was the manager of the green academies. Additionally, more than 6,500 CTE programs have been approved by the California State University and University of California systems.

Technical Assistance

Although California did not receive technical assistance from AED or OVAE for the implementation of its programs, the POS team received TA through the state Department of Education, the State Center Consortium, and advisory panels. The state Department of Education provided approximately \$2 million in funding for developing programs of study to meet requirements of the Perkins IV legislation (e.g., Tech Prep). In addition, municipal bonds were issued to support CTE programs. One member reported that local Kiwanis and Rotary Club members and Boy Scout troops provided in-kind support through service projects.

Ability of nonparticipating states to pursue POS without the TA. One respondent described five planning meetings for the year. Another said:

One of the weak points in our engineering program across the district is providing hands-on and trades skills to students, then transfer those to certificate as well as four-year university degrees. Therefore, we have been working on trying to develop a crane infrastructure technology lab where students can learn the skills and requirements to meet a general contractor license as well as pursue... certification that really ties architecture into our engineering program.

Another respondent said that the programs had enough money to continue.

Programs of Study

California currently has an eight-tiered POS model. The essential ingredients of this POS are:

- Statewide communication
- CTE directors
- Professional development
- Community outreach
- Business and industry involvement
- Teacher training

- Student leadership programs
- Curriculum development

Additionally, California has operating green academies as part of its partnership academy model. One member reported that Orange County has had a culinary arts program as a major part of the POS, leading to entry into a postsecondary hospitality management and culinary arts program.

Differences from prior efforts. The addition of green-focused partnership academies in the state differed from the strictly academic focus of prior programs.

The role of the government and addressing local needs. Two interviewees said that program administrators worked closely with a state senator during the development of POS. This helped with legislation, problem solving, and technical assistance. One respondent said that California is a “local control state” in which individual school districts are free to develop POS models. However, the state constrains funding by requiring that, if a school district applies for funding under the Perkins IV legislation, it must develop a POS satisfying the Perkins requirements. One respondent specified that in order for a POS to be successful, it must be built with local conditions, such as future employment and educational opportunities, in mind.

Model Development and Implementation

Timing. The period examined was one academic year, from September 30 through June 30.

Model development process (2009-2010). Although education in California is locally controlled, the development process for the POS as implemented in California was generally a “top-down process.” The local school districts could design their curricula to respond to local needs, but to receive funding, they had to comply with the requirements for Perkins IV and state policy. However, the model development process varied across districts and implementation sites. The following steps were taken in model development.

- The process began with meetings in which representatives of the various sectors developed curriculum and policy.
- The requirements of the Perkins IV legislation were considered for individual district-level models were considered. One member described his or her district’s work by saying that the members had formed advisory committees to update their curriculum and identify trends in the workforce. Committee members indicated that they were working to develop networks with other sectors. They also reported starting a web exchange of documents and other items to facilitate development.
- One member reported district development of a “Rapid Response Team” for timely technical assistance and grant writing.
- One member noted that the team was working to build a community of instructors to strengthen instruction in the POS courses.
- One member was working to align the community college and high-school programs of study to develop additional articulation agreements.
- Another member reported working to get more grants to support model development.

- One member noted that the group maintains contact with industry representatives to facilitate model development.

Self-assessment. The self-assessment process involved administering an assessment tool to approximately 800 students. The results were analyzed:

What do we do to improve? We looked at how the kids performed and looked for those schools where they scored abnormally high in comparison to everybody else. And then we asked the question, “What does your instruction look like for that topic?” And that’s to develop best practices... so teachers can evaluate their own instructional models and see if they could improve it in the future. So that was the cycle of our grant and our program.

No other formal self-assessment was mentioned by any respondents.

Model development and implementation. Regarding the process of transitioning from model development to development for implementation, one respondent mentioned that California was “about two years out from having a program implemented.” Another individual acknowledged that although some partnership academies were using green-focused models:

That doesn’t mean that all of our green academies are using this curriculum. They may be creating their own, but in order to be funded, they have to show us their POS, their sequence of career tech ed. Courses, and the academic courses that will be a part of the academy.

Responses to this question conflicted because California districts may develop their own curricula.

Development for implementation (2010-2011). During the 2009-2010 fiscal year, the primary efforts in development for implementation involved connecting the various stakeholders in the development process. These connecting activities involved identifying team members, modifying structures and systems to align them with the POS process, learning about green-focused POS, and identifying similarities and dissimilarities with other POS efforts. This process represented a statewide comprehensive movement toward integration of the green POS requirements, the technical assistance process, and the efforts of the local delivery systems to develop POS that met local needs.

2010-2011 goals. One major achievement was a signed articulation agreement for use the students in a district. Another respondent said that the group strengthened curriculum, implemented technology in their classrooms, and formed an advisory group of industry partners to help with curriculum development and assist with the program. Another individual indicated the development of two new course curricula, articulated with the local community college.

Items developed. An external company was hired to write a curriculum for POS, which was subsequently made available online. Another individual developed seven programs within a

learning community, including a culinary arts curriculum, which was then articulated with a local community college and a university's hospitality management program.

Another respondent indicated:

Articulation agreements [are] in place with American River College, which is in the Three Rivers district. And I'm working on articulation agreements with their drafting program at Sierra College. And up until the budget stuff, I had a formal agreement with Sacramento State through their Accelerated College Entrance program, too; my three years would qualify for their MA six course, which was a design and engineering course.

Two other respondents indicated spending most of the year developing and revising curriculum to align better with the POS model.

Interaction with implementation sites. The primary interactions between the individuals responsible for state policy and administration and the implementation sites appeared to be through a program of new academy orientation, similar to the TAA, in participating sites. In this orientation, individuals learned how to develop curriculum that aligned with the overall POS model. The other main strategy was the use of the internet to post curriculum information and other items for review.

Minimum standards met for OVAE. The following were minimum standards for POS.

- ***Aligning secondary and postsecondary elements:*** One member reported developing relationships among middle schools, high schools, and community colleges. Another said that some community college students teach course exercises to middle school students. Finally, another said that the secondary school staff attended postsecondary system meetings and trainings.
- ***Including academic and CTE content in a coordinated progression of courses:*** One member said, "A lot of the classes in our districts [that are] articulated primarily focused on math and English and all the CTE courses."
- ***Offering the opportunity for secondary students to acquire postsecondary credits:*** Many respondents indicated working to improve articulation with local postsecondary institutions. One respondent indicated that program participation led to credits in the Hospitality Management program at the community college.
- ***Leading to an industry recognized credential or certificate:*** One respondent indicated that program graduates would receive a five-year ServSafe food handler's card. Another indicated that he or she wanted students to take the national AutoCAD certification test.

2011-2012 plans. Consistent with the diversity of POS implementation across school districts in California, varied plans were outlined for the 2011-2012 year:

My plans are, number one, to work with the energy commission to develop recommended programs of study in energy and green and conservation—the whole works—based on the bill, and also based on the work that we're currently doing with the curriculum standards update. Once we have that done, and that advisory committee approves guidelines through the energy commission, we will put out a request for applications from the field. This time they will get extra points for following the recommended program of study rather than just submit what they want to do.

At our last meeting we talked about the articulation process, and what we have actually set up is a specific date (I believe it's in October of next year) where the teachers that are interested in creating a POS and an articulation agreement for their school with Cypress are all going to meet collectively and basically do what we did with just one school and one college. Next year we'll have the college, but we'll maybe have 10 high schools that will all be coming in to meet with them so they can get their articulation agreement in place and signed off.

Our plan is to continue; we have already set up 5 meeting dates for next year with our PLC and (are) working with our business and industry partners to develop professional development opportunities and trainings. I know a number of the teachers wanted to have professional development on how to use the technology better, in other words blogs and things of that nature.

Several respondents either had not completed plans for the 2011-2012 year or did not think that budgeting would permit the program to continue.

Implementation. One of the participants described implementing a POS:

Okay, so that is curriculum... you'd start with Intro to Energy, and then in the additional courses, you might also include Energy Auditing, if you have the time. Intro to Energy, however, could easily take two years. You might then go to Energy Auditing because that may take a quarter of a semester, and then the Green Construction and Intro to Alternative Fuels could easily take two years there. So the POS, all of them start with Intro to Energy, and then you branch off into which area of concentration where you want to go.

Another individual described the implementation process:

They have to follow the format and they have to show us, not with just course names, but content, how this is a sequence of courses that builds upon each other and leads to postsecondary education and employment opportunity. So, and then we analyze them every year, they have to provide for us every October an annual report that is very detailed. It includes program reporting, which includes the POS in addition to everything else, and it provide for us student performance indicators to show us their students are improving; they don't get paid if their students don't meet specific performance measures.

A third member said:

They do have science teachers that understand the impact of green and not-green on our environment, so we will put together recommended programs of study. We will make recommendations for how they can get themselves trained, or locate postsecondary teachers to work with or programs to work with, and they will get extra points for following our recommendation. So it is local control, but we can control what we give points for. You know, as a teacher you have an unlimited amount of extra credit points.

Another respondent said, “If you go up to cteonline.org, I believe (that) is the website, you’ll see that sort of a collecting point for these types of documents [curriculum], etc., for schools in California.”

Enablers

- ***Highly skilled secondary teachers:*** One member reported that his or her district has had a lot of teachers with doctorates teaching at the secondary level, which facilitated course certification.
- ***Financial and other assistance:*** Several members indicated that programs had received cash grants, equipment, or in-kind donations from the local colleges and civic organizations. These donations helped offset the cost of implementing technology-driven POS.
- ***Training, networking, and collaboration:*** One member noted that the opportunity to contact others for TA was helpful. Another individual noted that staff from his or her district had received training from postsecondary institutions on a variety of topics.
- ***Cooperation from government:*** One member indicated that support from the superintendent and the assistant superintendent was particularly helpful.

Barriers

Barriers included:

- ***Budget concerns:*** Several respondents noted that budget cuts and other financial problems were difficult to overcome. One in particular noted that budget cuts led colleges in their district to end articulation agreements altogether.
- ***Lack of communication:*** Several members noted that because of the size of their districts, it was sometimes hard to coordinate with the representatives from other sectors. Also, one member thought that information about the program was not adequately disseminated to the parents and students in their district.

- **Faculty credentialing:** One member noted that some colleges did not want to accept credits from secondary schools because they viewed secondary-school teachers as not having the credentials to teach courses that met standards for college credit.
- **Lack of cohesiveness:** A respondent noted that the state lacked a common curriculum across districts, causing some confusion between secondary and postsecondary entities.
- **Lack of demand:** There was currently an overflow of students into college in one respondent's area, making it hard to establish articulation agreements due to lack of demand.

Impacts

One member commented on perceptions of how access to the TA project could have helped California with the implementation of POS model:

We have all these seven different pathways and so forth... So we're just doing always lots of work and initiatives to do a better job with what we're doing. So I would suppose that your organization could be helpful in terms of working with this regional approach as we try to tackle a different problem.

The Case of Kentucky

Background and Contexts

Interviews about Kentucky were conducted with a state employee who worked in the federal programs branch of the Office of Career and Technical Education and with a consultant for vocational-tech programs in Kentucky.

Team. While developing POS, the state engaged representatives from industry and business, universities, community and technical colleges, high schools, the Office of CTE, and the Kentucky Department of Education. Teams were in charge of developing courses for each pathway, and a minimum of one POS had to be included in each local application.

Reasons for participating. Kentucky wanted to participate in the TA for several reasons, including improving the quality of CTE instruction, preparing CTE students for high-demand careers, creating curricula that relate to student needs and market demand, and minimizing the time required to earn credentials. The green focus was also an important consideration: “Well, we knew we needed to develop more green technology pathways. We have a few... we felt like we could use the assistance to make sure we were going in the right direction.”

Prior experience with POS. Kentucky had been developing POS for three years. The state had committed to develop at least one POS for each of 13 career clusters and had allotted funds to do so. Although these POS were not fully developed, efforts were underway:

Our system [was] a system of technical schools. They [finished] with us and then we have two or three organizations that [had taken] them as their apprentices in their programs. They [went] on then to develop their journeyman’s ticket, and so they [started] above minimum wage and [got] to use the skills and knowledge that they’ve gained in our vocational courses or technical courses. And we definitely [helped] them to find those positions.

Technical Assistance

Plans. If accepted by the NRCCTE TA project, the Office of Career and Technical Education would have developed green-focused POS for secondary and postsecondary education. An action plan was to be developed as a blueprint for POS design and implementation. Because Kentucky was not accepted for participation, the OCTE continued to use expert resources from area schools and consultants. For example:

We have our curriculum that our teachers [worked] together and [wrote] for us, one that’s the postsecondary segment who [worked] with us, as well, and the trades as well that [was] sitting with us. And we [tried] to best train our students, as we [said], “Make money for their bosses” as quickly as possible.

Other assistance for POS was not available.

Programs of Study

One example of an existing POS in Kentucky was:

The first one I worked for, we had four feeder schools or local school systems that fed students into our technical center. And we had programs of construction, mechanical title, auto mechanics, welding, carpentry, and electricity... the students... would come through in their sophomore year and take a look at them and would decide if they wanted to take any of them.

The focus was primarily on high school students.

Yes, all of our students in the Kentucky Tech System [were] high school people. We're called the secondary initiative branch. We [had] almost a seamless system. Once upon a time, we were one, but in 1999 we divided and the postsecondary folks took on the heading of Kentucky Community and Technical College Systems. We, as Kentucky Tech Systems, were secondary.

Model Development and Implementation

Without assistance from the TAA, no one tried to develop a green-focused POS.

No, we ended up dropping it at that time. Like I said, we did have a few and, of course, we are like everybody else. We wear so many different hats that we really just did not have the time to put in the project when we did not have the assistance that we were hoping to get.

Asked if self-assessment was a regular aspect of the POS development and implementation process, an interviewee said:

Well, the way we [did] it [was] we go for national certification and then, when it is nationally certified, then our kids [were] hired. They [had] an outstanding record of being able to do the job. I guess that [was] the final analysis of our assessment although we [had] formal assessments. We [had] an assessment department where we [went] into the programs and [looked] at what they have, what they are doing, and the results they are having in the placements that they [had], and so forth. But that's more of a formal placement for credibility, I guess, but the real assessment [was] our people [went] to work and [satisfied] their employers.

When asked about plans for the future of POS development, the state employee said, "Just that we're continually looking for upgrades and for ways to add to our knowledge and improve our message. We do that all the time this time of year."

Enablers

Only one contributing factor was identified by the interviewees: “At any rate, our teachers [were] professionals and so they... continually [looked] for ways to improve our programs.”

Barriers

No barriers were mentioned by the interviewees, although certainly they implied that a lack of TA was a major factor in stopping the development of green-focused POS.

The Case of Michigan

Background and Contexts

Three team members, representing postsecondary education, state government, and state Tech Prep were interviewed about Michigan.

The team. None of the interviewees described the specific composition of the team(s) that wrote the TA application and worked on POS state plans. One said that the state education office had four grant review teams, comprised of three to five internal people paid out of Perkins funds, whose primary purpose was to review grants. Each grant review team worked on the TA application. At the time of the interviews, no other Michigan team worked on POS state plans.

However, the education department, according to an interviewee, had “an ongoing leadership team that [met] every other week” and formed ad-hoc subcommittees as needed. For example, the department created a subcommittee to review last year’s TA application, “because we really want to strengthen and improve our application for next year.”

Reasons for applying to participate. Former Governor Granholm “urged Michigan... to embrace a commitment to enhance the rigor and relevance of students’ education, while aggressively connecting high school students with next steps in postsecondary education.” About six months before submitting the state’s green-focused POS TA application, Michigan formed High School Action Teams (Michigan State Plan for Career and Technical Education, 2008, p. 1). These teams had started to construct POS. While designing POS, Michigan applied for TA services, because the TA would have enabled Michigan’s High School Action Teams to establish relations with other POS.

Additionally, the teams thought that Michigan would have developed and implemented “more consistent statewide [models],” according to one interviewee. Another interviewee confirmed that “because we thought it was going to help us to have a more consistent model used across the state rather than choose your own method approach” that had been the typical process in Michigan.

Although the teams’ rationales for seeking TA assistance were to form relations with other states and create consistent statewide POS models, the director had a different reason for applying. According to one interviewee, the grant was viewed as an “opportunity to receive technical assistance” that would “emerge as something very strong in Perkins.”

Technical Assistance

Although Michigan did not receive TA services, the W. K. Kellogg Foundation assisted with securing POS within community colleges. Outside of Kellogg, Michigan pursued no other external TA.

The Michigan Department of Education provided training to the colleges during the implementation phase of POS. MDE conducted trainings around Week 10 of the development

process, and met once per month with the colleges via webinar. They also created websites that provided additional information and resources on forming POS.

Ramifications of not receiving TA services. Michigan developed green-focused initiatives, yet never proceeded with the creation of green-focused POS. Receiving the grant would have allowed the state to work on a green-focused POS. One interviewee said, “Getting a technical assistance grant would have allowed [MDE] to say we got our grant to do this, so we need the time to work on it.”

The TA services from the grant would also have facilitated the process of creating a green-focused POS. TA services also would have helped persuade team members to support the goals of a green-focused POS.

Another ramification of not receiving the TA services was lack of communication between secondary and postsecondary education as well as among external partners and other states. One interviewee said:

It would have improved the collaboration between the two departments. Because of the requirements of the technical assistance, we would have been able to have more conversation between the two different departments. One thing we are always anxious for is to have some way to communicate, but sometime the structure of government stops that.

It also would have given us a chance to work with external partners and be able to support that effort. That is a stronger opportunity because you get people from the field working with it, people that are not part of the government. You get more eyes to look at it before you are done.

Having the grant would have enabled Michigan to connect with other POS state teams. Michigan would have been able to share resources, success stories, and information about barriers to implementation. Further, Michigan could have learned about other POS and replicated them.

Programs of Study

High schools and community colleges implemented 30 POS, 17 of which were unique. The POS provided a range of career paths, including health programs, criminal justice, automotive, computer programming, early childhood education, and business. The state had no green-focused POS.

Differences from prior efforts. After applying for the TA services, Michigan made some changes to its POS development and implementation process. The new model required high schools that had an articulation agreement to have a POS. One interviewee said, “With that articulation agreement, it really reflects the four years of high school. It’s really the 2+2+2 model.”

Michigan also was expanding POS based on OVAE's 10 element framework (OVAE, 2010). In the summer of 2011, one interviewee stated:

We're going to try to do some work... with a group of career technical institute leaders to see what we can move forward with using the POS pillar model... We are looking at the 10 pillars; we're looking at what do we already have in place that lines up with that, and what do we need to expand?

The role of the government. Interviewees described the role of the state government as “top-down,” because the state of Michigan developed the “processes” that local governments, education systems, and organizations followed when developing and implementing their own initiatives and products. The local agencies had control over their POS as long as they complied with state “processes.”

Addressing local needs. Local needs are determined at the local level. State-level advisory groups provided guidance in the development process, but local colleges, businesses, and industries determined which POS to design and offer. One interviewee said:

We say... develop your own crosswalk and look at where it overlaps and where the gaps [are] within instruction. We do not tell them what that crosswalk has to look like; we just ask them to do the crosswalk. We say, “Develop a program of study”—we do not tell them what the format has to look like; they determine that.

Model Development and Implementation

Model development process (2009-2010). Without the TA services, agencies in Michigan had developed 30 non-green and three model POS. To assist, in 2009, MDE developed and published a resource guide for creating model POS. The resource guide was pilot tested on a program at a community college and was used three other times with minimal refinement. The guide ensured a consistent process and yielded a unique product for colleges.

Further, MDE provided TA to secondary schools and colleges developing POS. MDE connected the schools and colleges with agencies implementing similar POS. An advisory panel reviewed all POS and recommended changes to them.

Incorporation and alignment of postsecondary education elements. Gaps between secondary and postsecondary education existed. Kellogg Community College addressed the gap by reviewing, assessing, and realigning its curriculum to match secondary education and changing some of its textbooks to improve course sequence.

Industry-recognized credential or certificate. Interviewees mentioned one industry-recognized credential resulting from a POS. A corrections program at West Shore Community College created a certificate program that aligned with and was equivalent to its local sheriff's department's training for new officers. Students who earned the certificate and went to work for the sheriff's department were exempt from completing the department's training.

Self-assessment. Michigan relied on data to confirm the thoughts and opinions of leaders from government, education, business, and industry. The state thus determined characteristics of students who successfully graduated from a POS and verified requirements for student matriculation into a POS aligned with the successful characteristics, which then provided a base of evidence for state leaders to use when making decisions.

2010-2011 goals. Goals for the 2010-2011 year included:

- Increasing the number of community colleges with POS, and increasing the number of POS within each college.
- Meeting federal guidelines for a future Perkins V by adding the 10 elements derived from Perkins IV (OVAE, 2010) and by working with NRCCTE administrators.
- Providing students with courses and preparatory work in secondary education that better prepared them for college.
- Allowing students to progress to more advanced college courses by offering entry courses in secondary education.
- Establishing agreements between secondary and postsecondary institutions that allowed courses taken in high school to transfer to community colleges.

2011-2012 plans. Plans for 2011-2012 were uncertain. One interviewee said:

We can't figure out if it's better to have a lot of programs of study developed and then not have Year 2 or Year 3, or is it better to have the three that we have developed now all actively work on curriculum in Year 2 and Year 3. That is what we are trying to do right now.

To determine plans for 2011-2012, MDE planned to conduct telephone interviews with occupational deans to gather feedback on enablers and barriers to participation in Year 1 of POS development.

Enablers

These factors helped POS development:

- **Local advisory committees:** The local advisory committees were “responsive to the needs of the local economy, referring to the programs of study around the state because... the programs they're running up in the Upper Peninsula are [going to] be very different than what they're going to run down in the southeast part of Michigan.” The committee thus served community needs, including the more particular needs of rural communities.
- **Buy-in:** MDE developed its “process with input from the community colleges so... there was a buy-in... and support for the process from the start.”
- **Mini-grants:** MDE provided mini-grants to faculty members of community colleges as an incentive to create POS at their colleges and to share their work.

- **Websites:** MDE created websites that provided expert information and resources for people creating POS.
- **Training:** MDE also provided monthly trainings via webinar and one in-person training for teams drafting POS.

Barriers

Interviewees also identified a set of barriers, including:

- **Postsecondary leadership:** Because CTE was housed in MDE, staff members in charge of forming POS lacked postsecondary guidance. One interviewee stated, “Without the leadership on the postsecondary side, it just becomes money that’s distributed to the postsecondary partners with very little state guidance or direction to reach certain goals.”
- **Time:** Due to the six-month time limit, team members could not explore alternative POS ideas.
- **Mini-grants:** The \$7,500 mini-grants were perceived as too little—ultimately not encouraging faculty members to teach a POS class.
- **Autonomous institutions of higher and postsecondary education:** Higher education institutions did not accept all courses taken at a community college, claiming, “That’s not part of our transfer program.”
- **Inflexibility of postsecondary institutions:** The secondary programs, according to an interviewee, “have very top-down, from the state level, mandates. They have a solid core curriculum. They don’t have a lot of flexibility in what can be taught and even when it can be taught. So they don’t have a lot of flexibility.”
- **Gaps between secondary and postsecondary:** Secondary and postsecondary instructors delivered “the instruction and standards in a very different format or in a different time sequence.”

The Case of Minnesota

Background and Context

Interviews about Minnesota's NRCCTE application and current POS-related activities were conducted with six team members. The interviewees included educators and administrators at both the secondary and postsecondary levels and education policymakers at the state level.

The team. Minnesota's state team initially included representatives from high schools, technical and community colleges, the agricultural and construction industries, and state-level education administration. Answers regarding whether the team continued to work together were contradictory, but it appeared that the team that was assembled for the grant application to NRCCTE continued to function as a group to some degree.

Reasons for applying. Minnesota had prior experience developing and deploying POS in response to Perkins requirements, including working with consultants and examining other states' programs. Funding from the NRCCTE for TA was perceived as a potential advantage in the developing field of alternative energy, as well as a possible source of future funds for implementing POS.

Prior experience. Past work with POS generally included curriculum alignment and articulation agreements between secondary and postsecondary institutions (typically community colleges). Minnesota had also formed regional consortia, supported at the state level by the state Department of Education and the governor's Workforce Development Council. Each consortium was composed of representatives from education institutions and industry and worked to coordinate POS and other related activities at both the regional and state levels.

Programs of Study

Minnesota had implemented locally and regionally planned POS. They have moved from an essentially ad-hoc model, in which POS were local and dependent on the work of individual counselors and educators, to a model that is more transparent to students and parents. A website advertised the POS available throughout the state, organized by school availability and then by area of interest.

The role of the government. The state government provided TA, such as leadership and assistance in developing technical assessments, to local consortia, and implemented a program of accountability. Regarding the latter, one respondent said:

The role of the state is to provide guidance and set expectations for the use of the funds. The role of the locals is to ascertain the local needs through regional labor market information through the educational structures of the high schools and colleges of the region. They apply to the state annually for funding under the Perkins Act and include in that plan the POS that they intend to target.

Addressing local needs. Minnesota appeared to do a good job of addressing local needs. Because POS were developed in a “bottom-up” fashion by local or regional consortia, the resulting programs tended strongly to reflect the preferences of industry and needs of students.

Minimum standards for POS. Minnesota had adopted the OVAE model, and state efforts were directed to the OVAE standard.

- State and local government policies and resources supported the development and implementation of POS. From one educational administrator, “So from our level at the state, we are giving [local consortia] guidelines, giving them implementation suggestions, working with them, we provide assistance to them as far as developing their programs of study.”
- Each consortium was expected to make an effort to include industry leaders in the area. According to one participant, “In each POS, we brought in industry partners for each of those development teams.”
- Professional development is provided to local instructors through consortia. A state administrator noted, “We’ve actually dedicated funds for a local [consortium] leader. We’ve paid 60% of her salary the last 3 years. And she has been working with the local consortia leaders. She actually goes to their sessions and does professional development.”
- Many consortia have hired consultants to assist with developing technical assessments of POS, as well as evaluation of related student outcomes.
- Minnesota’s POS include course sequences and articulation agreements that led students who were prepared to enter two- or four-year institutions to specialize in the POS area.
- High schools used POS as a counseling and academic advising tool.

Developing Programs of Study

Minnesota did not receive TA from NRCCTE. The state’s process for developing programs was outlined as follows by an interview participant:

We’re having ongoing debates. When we said the POS would be developed at the regional level, that meant that the locals had to have rationale for developing the programs that they chose. One of the dilemmas we’ve had as this model has moved forward, the term “POS” seems to have two almost competing purposes. One is to be a guidance model which would encourage our local recipients to develop many POS to provide guidance to students, particularly at the younger age. The other is an accountability model tied in with technical assessments that encourages our recipients of funds to have a few [programs of study] and target their efforts on a few. We haven’t made a final determination yet.

The details given by interviewees on developing POS in Minnesota were sometimes contradictory. Different stakeholder groups described the process differently, and it seemed likely that the underlying process of development may itself be unclear to participants. A state administrator described the problem as follows:

We have an approval process that we have at the state level. I'm going to tell you we're not 100% happy with it but, because we're not feeling that some of the local consortia quite understand, it needs to be more focused than what they have, but we're giving them the opportunity to work with their local high schools and colleges along with business and industry partners.

The overall picture was that the consortia detected a need for a new POS, often based on input from local industry and possibly from students or parents. In developing the program, the consortium created a course series and articulation agreements, with each agreement including at least one participating high school and a postsecondary institution, typically a two-year college. The POS was then validated by local industry representatives and sent to the state level for review. State administrators compared it to a set of core competencies or career clusters, and the POS was approved or returned for revision.

The major strength of this process was that it clearly responded local needs. Educators at both the secondary and postsecondary level appeared satisfied with the support and guidance they received from state officials. However, as noted above, there appeared to be no consensus on what purpose a POS was to serve. Additionally, the process appeared to be prone to duplication of effort by consortia, which did not share resources.

Enablers

These factors helped:

- ***Effective cooperation between state and local educators:*** “We have a couple of coordinators that are with the Perkins program that [worked] directly with the postsecondary institutions within our area and within the state as well to help coordinate these pathways of study.”
- ***Integration of electronic data:*** “So those kinds of things, the maintenance of this data, the entry of it and then the maintaining of it, [was] something that is not easy to do but it... I think it's a good thing in the end. And we are getting to a place where we're figuring out how to do it efficiently and make it work.”
- ***Responsive to local needs:*** “The fact that we went to the teachers and business partners to identify the skills that mattered and built POS from those skill sets has been a valuable approach. They used the database and skills that came out of the careerclusters.org work. They didn't just rely on that. They used that as a basis of discussion and then established for themselves skills that they deemed appropriate.”

Barriers

Many interviewees also discussed existing barriers to the development, implementation, and propagation of POS, including:

- ***Changing landscape:*** “I think the changing landscape of postsecondary colleges here in Minnesota... you know they’ve had a lot of changes on the postsecondary level that make the... you know, every year the pathway of study is a little different. You know, it [needed] to be updated, it [needed] to be tweaked... if you [had] a student starting out as a ninth or tenth grader, by the time they’re a senior they may have had three different documents or three different pathways for something as things [changed].”
- ***Time constraints:*** “It’s a lot of work and its time-consuming. In many of our smaller school districts, we’re asking guidance counselors to do the work; and they [did not] have a lot of extra time, and so there’s been some resistance from the secondary team teachers. Postsecondary faculty [were] involved, but right now at this point don’t have to dedicate as much time as the secondary folks do.”
- ***Inefficiency and duplication of effort:*** “The biggest challenge [was] the way it [has] been structured in Minnesota. It [was] locally driven, so that means we can’t, we don’t put a big blanket over it and say here’s a program of study in automotive... each building [had] a different template. So you [had] to have the people power and the people willingness to do the work, to meet and talk and do all of that. So, even though I think it’s a good model... it still [was] very cumbersome and time-consuming.”

The Case of Pennsylvania

Background and Contexts

Roles of interviewees. Four team members representing postsecondary education, state government, and state Tech Prep, including the team leader, were interviewed in Pennsylvania.

The team. The Pennsylvania team included three key individuals who were “instrumental” in the effort as well as several partners from CTE and postsecondary areas. No interviewees described the specific composition of the team that wrote the TA application or worked on POS state plans. The three key people were based at the state’s Department of Education. One of them, a policy person whose position was tied to the governor’s administration, was no longer with the Department of Education because of the change in governor.

Multiple partners, perhaps 8 to 10, were identified by the interviewees as participants in meetings. These partners were described as “experts” and “representatives.” They were “career and technical administrators,” “curriculum-type people,” “individuals from the Department of Environmental Protection,” and “individuals with expertise in green building technologies.” The state leader described POS as “comprised of secondary and postsecondary teachers.”

Reasons for applying to participate. According to the team leader, Pennsylvania applied to participate in the program because it fit well with the efforts to develop POS and the desire to create a green curriculum:

We were in the process of developing programs of study, and during that process we were identifying green paths, hoping the technical assistance would help expand our own knowledge about “green,” because I think at that time of green as a new wave.

The leader said that an opportunity was seen to zero in on green-focused education. Other interviewees could not recall why the application was submitted.

Technical Assistance

Although Pennsylvania did not receive TA through NRCCTE, an out-of-state consultant provided some technical assistance. This consultant served on the Governor’s Green Government Council and as an expert during the development of green-focused additions to the POS. A representative from the Department of Energy and the Department of Environmental Protection provided further assistance. According to one interviewee, he served “in regards to phase three of the POS development, and we had him on board as a sort of a steering committee too.”

Ability of nonparticipating states to pursue POS without the TA. Not receiving the TA services did not appear to hamper POS development and implementation in Pennsylvania, but did appear to limit the state’s ability to develop and implement green-focused POS. Although greening was encouraged (as one interviewee stated, “If they did not identify green, they have the opportunity to add green to the programs in their area”), the POS that were developed were not green. One

interviewee specifically highlighted this lack. “I think they could have helped us focus more on the green—[I’m] not so sure with some of the statewide programs of study that they fully understood green.” According to this interviewee, had the TA services been available in Pennsylvania, “[W]e would have been further ahead in that aspect.”

Programs of Study

Approximately 38 POS have been developed in Pennsylvania. During the 2009-2010 year, 15 to 16 POS were developed. The state has made efforts to incorporate some green issues into the existing and newly developed POS, but to date does not have a green-focused POS.

Differences from prior efforts. No interviewees addressed differences from prior efforts.

The role of the government. Pennsylvania was described as having a “regulatory department of education.” Government’s role in the development and implementation of POS primarily focused on development. As one interviewee said, “We decided that the state would develop the programs of study, and the locals would implement.” In this sense, the organization is a top-down approach to development and a bottom-up approach to implementation. Another interviewee said, “The state [developed] the program of study... and the local entities [got] together to identify the statewide competencies.”

The government was also involved in evaluation, most recently evaluating some POS developed in 2007. The representatives evaluated the POS with a 24-point checklist and identified ways to improve implementation of the POS. Supplemental funding is tied to program success, giving incentives to improve. “The schools that want to continue to receive state funding have to adhere to the standards.” However, as one interviewee said, “I can’t sit there and say ‘Well, if you can’t meet this, we’re going to pull your money away.’ It’s not that way.” Rather, the interviewee said, “As the finish line draws near on Perkins IV... we’re giving them enough time until then to get their act together.”

TA was also available through the state. One interviewee said, “The state does provide assistance to the schools and has resources in order to meet the Perkins regulation.” This interviewee added, “The state [had] established a technical assistance program, providing services for professional development to local schools.”

Addressing local needs. The course sequences were developed at the local level. State representatives conducted site visits to 10% to 15% of the districts yearly, and otherwise interacted with implementers through two annual conferences and evaluation efforts.

Model Development and Implementation

Model development process (2009-2010). Initially, the Department of Education identified which POS were to be developed. Teachers were then recruited to identify courses needed for each POS. One interviewee said:

The state developed a POS by CIP [Classification of Instructional Programs]. So the state contacted each of the schools that have that CIP as an approved program. Then the schools asked their teachers to be released to sit on the statewide committee. The schools were also asked to identify someone from their occupational advisory committee, which was their business industry group. Then postsecondary entities were also asked for their faculty to join the committee. Thus, each program of study was actually comprised of secondary and postsecondary teachers.

One interviewee described how the state chooses which POS to develop.

Well, right now how they [were] being developed... [was] on L&I's needs, the regional needs, and how many of the programs [existed] out there... The state [was] not really going to spend a lot of effort to develop a program of study for a particular program or SIP when there's only 5 or 6 of them that exist throughout the state.

Alluding to the top-down approach to model development, one team member described a limited amount of interaction:

There were people from the state department who kind of took a lead, and everyone did reviews and follow-ups and did things to move the process along. I would say that it involved multiple conference calls; I think we all might have gotten together once or twice for a meeting, but that didn't happen much. It was more of a non-face-to-face event.

Much of the work involving the state was done independently, and secondary and postsecondary teachers collaborated on the choice of competencies to include in the POS. To focus the POS on green issues, the state formed groups and then asked them to “add any green components in there that they deem fit.”

Because many POS have been implemented, the state was beginning to look at evaluating the POS and shifting attention away from development. According to one team member:

Each year, since 2007, the state has identified different things to work on. Right now, since it's been five years, the state [was] going to revisit phase one and two programs of study to revise and update. The state [was] not developing new POS at this time.

Incorporation and alignment of elements of postsecondary education. The interviewers asked about meeting OVAE standards. In Pennsylvania, the POS incorporated and aligned elements of secondary and postsecondary education. In terms of model development, the state created a task grid that was then passed along to the recruits from secondary and postsecondary educational institutions, who created and aligned courses for the POS.

Acquiring postsecondary credits. For Perkins recipients, the state mandated that at least nine credits be awarded by the postsecondary institution for completed coursework for students progressing through a POS at the secondary level. One interviewee described the model:

We have what we're calling a statewide articulation agreement. Every Perkins postsecondary recipient [had] signed off on this, indicating that they will grant a minimum of nine college credits – I believe some programs [were] offering 25 for the coursework. Schools link to the postsecondary competency list, and they determine which courses at the postsecondary institutions that the students do not have to take, because it's covered at the secondary level.

Industry-recognized credential or certificate. One interviewee identified NOCTI as a testing requirement for students in POS. Students win certification upon passing the test. “If they get ‘advanced’ or ‘competent’ in regards to the score among their peers and the state, they will receive a certification for that.” All POS students must take the test. According to one interviewee, “If a student does not complete the program, if they fulfilled 50% of that obligation to that program, they [were] required to take that test.” In addition to certification, the test was used to evaluate how well students were performing in the POS.

Self-assessment. In Pennsylvania, the Department of Education was reviewing and evaluating POS that had been developed several years previously. The topic of self-assessment was not otherwise addressed in the interviews.

2010-2011 Goals. Goals for the 2010-2011 year were not specified in the interviews. Four new POS were finished and the state was working on an evaluation plan.

2011-2012 Plans. Interviewees mentioned planning to evaluate the POS. Because many POS had been implemented, the state was now able to work on improving them, using evaluation results. One interviewee mentioned that greening was to be a new focus. “This time when we go over the programs of study, we’ll have a better assessment of the green concept.”

Enablers

These elements helped in developing and implementing POS:

- **Support of the CTE community:** The desire of the CTE community to push for better POS supported these efforts.
- **DACUM:** Most interviewees said that DACUM was helpful in POS development.
- **Background data:** One interviewee cited the survey *Jobs for the Future* as a valuable resource in developing POS.

Barriers

Interviewees also identified barriers:

- ***Communication:*** Communication issues were a barrier to developing and implementing POS. One interviewee described “stereotypes” and people who were “stuck in their ways,” and thought that a necessary step was breaking down the stereotypes. Terminology also contributed to the communication barrier.
- ***Turnover:*** “Government leadership has changed, and some of the top-level people in the Department of Education are no longer there. Some of them still are, but some of them are not; so it’s hard to say exactly what’s going on there. Hard to get that continuity.”



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