

Comprehensive Professional Development A Review of the Literature

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Vicky Ragan & Carrie Liston

Puget Sound Center
21540-30th Dr. SE, Suite 310
Bothell, WA 98021-7015
425.368.1029

vragan@psctl.org
cliston@psctl.org



Project Background

Evaluation & Research Associates of the Puget Sound Center for Teaching, Learning and Technology (ERA-PSCTLT) was contracted by the Illinois Center for Specialized Professional Support to conduct a literature review on the topic of comprehensive professional development. The literature review is designed to identify successful practices in the field of comprehensive professional development and will be usable as a stand-alone document to help shape future professional development planning.

The project had the following components:

- Research on published information about professional development within the last ten to fifteen years.
- Summary of professional development resources and research with an emphasis on resources most relevant to comprehensive professional development.
- Written to help guide professional development planning and provide current and relevant research on professional development practices.
- Comprehensive list of professional development references and resources.

Review of Literature

This report contains a review of the literature related to comprehensive professional development with a focus on Career and Technical Education (CTE). It includes a reference list of cited literature gathered from online indices and databases, professional journals, books, and professional organizations. This report follows a preliminary report that included an abbreviated reference list containing short abstracts, an outline of the literature review, preliminary findings, and next steps.

Comprehensive Professional Development A Review of the Literature

Comprehensive professional development refers to a design where all teacher professional development opportunities are integrated and aligned across system levels, including teacher preparation and inservice, and all sources, including the school, district, and state. This structure contrasts with other types of professional development offered to teachers with no overall plan or shared goals. While efforts are being made to provide professional development opportunities that are sustained and relevant to practice rather than standalone trainings, there are fewer examples of comprehensive professional development implementation.

This literature review focuses on comprehensive professional development in career and technical education (CTE). It looks at effective practices for professional development in general and how they relate to the comprehensive approach, professional development in CTE, the process of planning and implementing comprehensive professional development, including how higher level structures can support professional development, and results of implementation.

Effective Professional Development

Professional development is defined as formal learning opportunities provided for teachers to improve their knowledge, skills, and classroom practices (Smylie, Allensworth, Greenbert, Harris, & Luppescu, 2001). In education, professional development is considered a critical mechanism to developing teachers' content knowledge and pedagogy (Desimone, Porter, Garet, Yoon, & Birman, 2002) as well as a mechanism leading to school reform (Borko, Elliott, & Uchiyama, 2002). Studies have shown strong links between good teaching and student achievement (Casserly, 2002; Desimone, et al., 2002; Sparks & Hirsh, 2000)

Characteristics of comprehensive professional development are frequently identified as qualities of effective professional development, such as sustained, long-term, embedded, intensive, cumulative, connected to other aspects of school change or school improvement, and driven by a coherent long-term plan (Darling-Hammond & McLaughlin, 1995; Murphy, 2000; Smylie et al., 2001; Sparks & Hirsh, 2000; WestEd 2000).

Kedzior & Fifield (2004) state that effective professional development is extended, part of daily work, ongoing, coherent and integrated. They include "*coherent and integrated*" among ten qualities of effective professional development, which they describe as incorporating "*experiences that are consistent with teachers' goals; aligned with standards, assessments, and other reform initiatives; and informed by the best available research evidence*" (p.2). Elmore (2002) writes that professional development should sustain focus over time and be consistent in practice.

Sustained professional development that is well-integrated into the teaching work day has been found to be more effective than more traditional one-shot, training sessions held outside of the school day at a location other than the school (Mundry, Spector, Stiles, & Loucks-Horsley, 1999). Linda Darling-Hammond, a leader in school reform, states that, *“If schools are to be structured for success, professional development needs to be an ongoing, integral part of teaching, rather than a sideline activity”* (1999). Cook & Fine (1997) similarly write that professional development should be integrated into teachers work, *“professional development can no longer be viewed as an event that occurs on a particular day of the school year; rather, it must become part of the daily work life of educators”* (p. 1). Instead of being devoted exclusively to discrete inservice days, professional development must be part of every school day and must be closely linked to the day-to-day demands of teaching.

The Association for Supervision and Curriculum Development (2003) names nine general principles of successful professional development, including that it be primarily school-based, built into teachers’ work, and ongoing. According to the Education Alliance (2005), one of the most reliable ways to increase the quality of the teaching force is to provide professional development programs that are ongoing and sustained, school-based, and job-embedded.

D’Ambrosio, Harkness, & Boone (2004) believe students’ perceptions of teaching strategies used in classrooms should inform the professional development designed for their teachers. Since teachers cannot be mandated to adopt what they learn in professional development, D’Ambrosio et al. (2004) suggest five features that lead to success: 1) addressing pre-existing knowledge and beliefs; 2) sustained opportunities to deepen and expand knowledge; 3) treat teachers as learners consistent with how you want them to treat students; 4) ground learning and reflection in classroom practice; and 5) provide ample time for reflection and collaboration.

Thomas Guskey (2000) examined thirteen lists that identified characteristics of effective professional development and found a number of commonalities, including: *“Start With Standards,” “Align With Other Reform Initiatives,”* and *“Are Ongoing, Career-Embedded, and Sustained.”* In summary, the agreement reflected in the literature on features of effective professional development correspond to the inherent features of comprehensive professional development, such as sustained, ongoing, embedded, coherent, and integrated.

Current State of Professional Development

Despite evidence showing characteristics of effective professional development, teachers generally do not have many positive professional development experiences. In one study, 50% of teachers stated that their professional development made little difference in improving their teaching practice (Farkas, Johnson & Duffett, 2003). Richardson (2003) notes that most staff development conducted with K-12 teachers derives from the short-term transmission model, pays no attention to what is already going on in a particular classroom, school, or school district, offers little opportunity for

participants to become involved in the conversation, and provides no follow-up opportunities. According to Sparks (2002), *“More often than not, staff development for teachers is fragmented and incoherent, lacks intellectual rigor, fails to build on existing knowledge and skills, and does little to assist them with the day-to-day challenges of improving student learning”* (p. 85).

Researchers of the large-scale Eisenhower program looked at the coherence of teachers’ professional development experiences, such as whether it was based on their own teaching goals, whether it was aligned with district or state standards, and whether they had discussed or shared what they had learned with other teachers or administrators (Desimone et al., 2002). On a scale from zero to nine, with zero representing no types of coherence and nine representing all forms of coherence, the mean was 5.33, reflecting a fairly low level of coherence. Eisenhower funds were intended to be used to support professional development that was sustained or intensive, though every district used at least a portion of the funds for opportunities that were not sustained or intensive (Garet, Porter, Desimone, Birman, & Yoon, 2001).

Despite its essential role in educational reform, professional development typically does not receive adequate support in systemic reform efforts (Borko, Elliott, & Uchiyama, 2002). Elmore & Burney (1999) believe that although we know a good deal about the characteristics of effective professional development, we know less about how to organize successful professional development so as to influence practice in large numbers of schools and classrooms.

Hornbeck (2003) states that *“school districts spend much more on professional development than they think, and most of it is neither actively managed nor explicitly linked to a district strategy”* (p. 28). Forty to sixty percent of professional development funds are external, such as federal, special program, and private funds, which Hornbeck believes has contributed to fragmented professional development efforts and lack of long-range planning as funds often come with spending requirements. Multiple funding streams contribute to the fragmentation of goals and delivery of professional development because the funds often come with restrictive or specific goals and activities. Hornbeck believes that districts should move away from organizing activities around funding sources and combine funding streams to support integrated efforts aimed at school needs.

This literature shows the discrepancies between the research on effective professional development and the current state of professional development opportunities for teachers. As Elmore (2002) states, *“Spending more money on existing professional development activities, as most are presently designed, is unlikely to have any significant effect on either the knowledge and skill of educators or on the performance of students”* (p. 8). Additionally, the literature points to the lack of examples of implementation and research on large-scale professional development efforts and systemic reform.

Comprehensive Professional Development

Comprehensive professional development is based on the premise that isolated and fragmented professional development produces inconsistent results. Garet et al. (2001) define coherent professional development as the degree of consistency between professional development and teachers' goals, standards, and opportunities for continued professional communication.

Killion (2002) writes about the importance of a comprehensive system to guide professional learning,

To produce greater results for students, professional learning must be embedded into a system of comprehensive reform. Such reform must include rigorous content standards, assessment programs that inform teaching and measure student progress toward standards, policy changes that recognize the importance of and provide support for quality teaching, and leadership that advocates high-quality professional learning and communities of learning. (p. 9)

The literature reflects a call to plan coordinated professional development that relates to a larger goal. Hirsh (2004) states that *“professional development functions most effectively when it is embedded into the district or school plan and is seen as the primary strategy for achieving district or school goals.”* A comprehensive plan is supported and implemented at every level so professional development activities align with larger improvement goals. One of the lessons of the Eisenhower program, a three-year longitudinal study of teachers' professional development experiences, was that professional development should be tied to a vision that aligns with standards and assessments, and coordination with other programs; core ideas of the comprehensive approach (Association for Supervision and Curriculum Development, 2003).

Comprehensive professional development has inherent qualities that have been identified in the research (detailed in a previous section) as effective, such as being sustained, ongoing, results-driven, standards-based, and integrated.

Building a Comprehensive Professional Development Plan

According to Hirsh (2004), creating a comprehensive professional development plan is not as simple as compiling different plans of districts or colleges. Instead, the plan must include context, or policies to guide system planning and operations; process, or procedures for developing action plans; and content, or action plans that outline what adults will learn and do to achieve their goals. Hirsh believes stakeholders at all levels should be involved in the planning process to increase the quality of the comprehensive professional development plan, and help establish a shared vision that makes the plan more likely to be implemented as intended.

Hirsh (1997) describes how comprehensive professional development plans are built for K-12 school districts, beginning with districts identifying identified goals for

student learning and adopted improvement plans at the district, site, and often department levels. A broad-based team that includes representation from all levels of the organization typically develops these plans. With regard to a state or national implementation, Kutner & Tibbitts (1997) also agree that institutionalized professional development should involve stakeholders from all levels of government and service delivery areas. Kent (2004) states that teachers, administrators, and parents should be involved in collaborative planning of professional development. A compelling mission and clear expectations for measuring student learning typically guide such plans. The mission and objectives guide the selection of professional development strategies that enable the district to achieve the goals. This same process can be applied to comprehensive plans starting at any level, such as state or national plans.

The International Technology Education Association (2005) notes five questions that should be answered when constructing a standards-based professional learning program for technology teachers: 1. *Where are we now?* 2. *Where do we want to go?* 3. *How are we going to get there?* 4. *What knowledge and abilities must educators possess to get there?* and 5. *How will we know when we have arrived?* In order to answer the question on where we want to go, the report provides an example of professional development outcomes aligned with *Advancing Excellence in Technological Literacy* standards, including:

- Provide teachers with knowledge, abilities, and understanding consistent with *Standards for Technological Literacy: Content for the Study of Technology*.
- Provide teachers with educational perspectives on students as learners of technology.
- Prepare teachers to design and evaluate technology curricula and programs.
- Prepare teachers to use instructional strategies that enhance technology teaching, student learning, and student assessment.

Deojay & Novak (2004) point to the benefits of using student data to guide school improvement plans and teacher professional development. In one school, goals and objectives were formed based on data and with the input of multiple groups at many levels, including the principal, a school improvement team, an advisory council, and teacher's individual growth objectives. The school showed improvement over six years on a number of measures, including grade-level assessments, curriculum-based assessments, and standardized tests.

As with all professional development, it is important to reflect and evaluate on the successes and challenges of a comprehensive professional development plan and make revisions to ensure success (Bybee, 2001). This may entail gathering teacher feedback on teacher learning and practice and/or monitoring student learning and achievement (Elmore, 2002).

The Role of Colleges, Districts, and States in Professional Development

A large portion of teachers' professional development occurs in the school district or is influenced by district-level decisions and policies, though it is often diffuse in focus as evidenced by the large variation in professional development experiences among teachers in the same school (Casserly, 2002; Desimone, Porter, Birman, Garet, & Suk-Yoon, 2002; Keller, 2002). Marsh (2000) contends that school districts play a significant role in improving instruction through providing professional development. Teachers' work is inextricably connected to the systems in which they are employed, "*Systems exert a powerful influence over the professional learning and the day-to-day job performance of employees*" (Sparks, 2002).

In *Components of a Comprehensive Professional Development System for Adult Educators*, Kutner & Tibbitts (1997) state that "*it is essential to establish and maintain and intergovernmental infrastructure that can support and institutionalize professional development*" (p. 3). They also include a list of state-level support responsibilities, beginning with determining the structure and content of the professional development and creating a plan with input from key stakeholders. As ongoing support, the authors specify that states should allocate sufficient resources, monitor the professional development and instructors, provide technical assistance, and revise the plan as necessary. The National Staff Development Council writes that school systems should set standards for student learning, teaching leadership, and staff development, and monitor systems related to those standards (Sparks, 2002).

Cook & Fine (1997) suggest establishing a diverse group to plan professional development:

[A] statewide and/or regional task force on professional development that focuses on identifying the time, resources, and opportunities for professional development as well as on gaining the support of the public and policymakers for professional development. The task force would bring together a broad-based group of practitioners, policymakers, and scholars in professional development. (p.4)

A standard of professional development proposed by the National Staff Development Council (NSDC) is that "*effective staff development is aligned with the school's and the district's strategic plan and is funded by a line item in the budget*" (cited in Hirsh, 1997). In order to determine whether this standard is being met, Hirsh (1997) suggests answering the following questions to evaluate staff development opportunities:

- Are district and school improvement plans and processes of high quality?
- What is staff development's relationship to district and school goals for student learning?
- What criteria will guide what staff development is designed and delivered?
- Are adequate resources set aside to ensure staff development can fulfill its obligations to district and school improvement goals?

- What steps will ensure that staff development decision making is aligned with district and school improvement plans?

These questions reveal the importance of ensuring the alignment of district and schools' plans and goals.

Anderson (2003) discusses the history of district involvement in professional development, citing research by Berman & McLaughlin (1978) showing professional development is more effective when it focused on solving problems that had been identified in student and school performance rather than programs that forced compliance or restricted access to resources based on participation. In the 1980s and 90s, the *"effective schools paradigm"* looked at schools as the unit of change, replicating characteristics of effective schools and largely ignored the district role. Studies such as Fuhrman & Elmore (1990) presented evidence that school districts can influence instructional practices utilized across a district. Elmore & Burney (1999) looked at a district that set long-term goals, utilized instructionally-focused professional development, sustained system-side focuses for improvement, decentralized responsibility for implementation and accountability for goal attainment, and as a result made large improvements in student performance.

Anderson (2003) also identifies challenges to an effective role of the school district in professional development, including internal political conflict, a high percentage of inexperienced teachers, students with learning challenges, a lack of instructional coherence and the cost of reform. Instead, an effective school district emphasizes professional development, *"Districts that believe that the quality of student learning is highly dependent on the quality of instruction organize themselves and their resources to support instructionally focused professional learning for teachers"* (p. 11).

Implementation of Comprehensive Professional Development

The Eisenhower Professional Development Project is a large-scale study that offers evidence of what constitutes effective professional development. Researchers investigated three years of professional development efforts and measured resulting changes in teaching. They believe it is a challenge for districts to focus on and set priorities for professional development activities over time. Desimone et al. (2002) state that the Eisenhower project suggests, *"change in teaching would occur if teachers experienced consistent, high-quality professional development"* (p. 105).

Certain characteristics were found to be more successful in improving teaching practices in the Eisenhower project. Among them were providing opportunities for active learning, being coherent and consistent with teachers' goals and other activities, and involving the participation of teachers from the same subject, grade, or school (Porter, Garet, Desimone, Yoon & Birman, 2000; Garet et al., 2001). They found high levels of collaboration and co-funding between the Eisenhower Initiative and other federal programs, which they believe was aided by the same content-area focus (Garet et al., 2001).

Newmann, Kings & Young (2000) found a powerful positive association between comprehensive professional development and the extent to which the principal exerted leadership to shape professional development along these lines, showing how leadership plays a strong role in determining implementation of comprehensive professional development plans. A study of almost 500 teachers found that the perceived coherence of the professional development activities with districts' goals for student learning and with their goals for professional development was a strong predictor of curriculum implementation, including protocol use and preparation for student inquiry (Penuel, Fishman, Yamaguchi, & Gallagher, 2007).

Kentucky implemented a state-wide, standards-based educational reform effort in 1990 and teacher professional development was a central component, receiving a substantial sum of the funds. An extensive professional development program was developed to assist educators in meeting the new state standards. Each school also had to submit a professional development plan that focused on meeting the standards and was tied to the school or district mission, goals and objectives. At the four exemplary schools selected in a case study, the professional development program also met the needs and interest of faculty. (Borko, Elliott, & Uchiyama, 2002).

Challenges of implementing comprehensive professional development include creating buy-in from the sources providing the professional development so that the opportunities are implemented as planned. Additionally, ensuring that opportunities meets the instructional needs of teachers and specific local needs rather than being too generic (Kent, 2004).

Another challenge of a comprehensive professional development plan is dedicating sufficient time in teachers' schedules. Cook & Fine (1997) recommend that organizations at all levels support reserving between twenty and fifty percent of teachers' time for professional development. The multiple streams of funding for professional development shown by Hornbeck (2003) make it difficult for districts to align goals and coordinate opportunities. Since funders have differing perspectives of the desired outcome of their professional development, it will be necessary to identify a common set of objectives.

Dutro, Fisk, Koch, Roop, & Wixson (2002) viewed a statewide reform effort as a form of professional development, and found that implementation depended on the districts and individuals involved. Districts are not "blank slates," and their size, structure, and history influence how state mandated policies are implemented. Additionally, teacher characteristics influenced the level to which reforms were adopted in the classroom.

Impact of Comprehensive Professional Development

Due to the rarity of documented implementation of comprehensive professional development, as well as the lack of studies investigating impact, not much is known of the impact of comprehensive professional development. Theoretically, the features of comprehensive professional development as a sustained, ongoing, aligned, goal-

oriented approach are characteristic of effective professional development that have been linked to higher adoption by teachers, improvements in teacher instruction, and therefore increases in student learning.

A study conducted by Casserly (2002) found that school districts that had comprehensive and coherent professional development opportunities had higher than average rates of student achievement, compared to other districts in the states where they were located. The Eisenhower project also found the alignment of goals and objectives in professional development as more successful in changing teacher practice compared to opportunities that were not coherent or integrated (Porter, et al., 2000; Garet et al., 2001).

Joerger & Bremer (2001) note that not much is known about how teacher induction interacts with system-related issues, *“while many system-level issues affecting new teachers have been identified, little is known about the relative importance of system change in improving experiences and outcomes for beginning teachers and their students”* (p.18). They recommend future research to determine effectiveness of professional development, *“Given the intensifying interest in improving the effectiveness and retention of CTE teachers, it is unfortunate that prior research and model programs have not led to systematic implementation, and subsequent evaluation, to verify effectiveness. This work is critically important, and remains to be done”* (p.18).

Kutner & Tibbitts (1997) discuss the difficulties of assessing the impact of professional development on student learners. They suggest evaluating the learner’s reactions to new content and approaches, acquisition of knowledge and skills, and changes in student behavior.

Professional Development in Career and Technical Education

This literature review focuses on the content area of career and technical education (CTE). The following sections include literature regarding CTE teacher preparation programs, teacher induction programs, and inservice professional development. A comprehensive professional development plan would address these areas of teacher learning.

Career and Technical Education Teacher Preparation Programs

Bartlett (2002) posits that many of the promising practices for teacher preparation, licensing, and certification are directly applicable to professional development, *“...ongoing learning can result from the same methods as initial training, but be used to further develop and update skills of the career and technical educator. The same methods could be used for advanced development of skills and to ensure teachers are up-to-date in both the technical and teaching and learning areas”* (p. 21).

Bartlett synthesized the available literature on preparing, licensing, and certifying postsecondary career and technical educators noting the lack of available knowledge, consistency, and organization of the requirements to become a

postsecondary career and technical educator. The lack of empirical evidence made it challenging to identify best practices, but he was able to determine three similarities in policies and procedures, including that programs should:

- Be flexible due to the varied levels of education and experience postsecondary educators have upon entry into the field.
- Include an educational component that helps develop skills in the area of teaching and learning.
- Include a technical-content component that ensures individuals have the technical knowledge to teach in the specific licensed area.

Bartlett suggests an approach for developing community college faculty that would provide them with more recognition, *“have them participate in a rigorous, non-university-based certificate process that would provide more visibility and bring recognition to community college instructors. The National Board for Professional Teaching Standards has a similar program available for secondary career and technical educators.”* He states that a well-prepared community college faculty is a benefit to all, *“Available research shows that professional development in community colleges benefits both the institution and individuals”* (p. 21).

Uneven preparation, licensing, and certification practices are a barrier to those who want to become CTE educators and also raises a challenge for those setting standards or developing a comprehensive professional development plan for CTE educators. Bartlett (2001) suggests addressing the differing levels of preparation and development of CTE teachers by studying inservice teachers to determine what they need and creating the necessary programs based on that information, *“look at the numerous pathways that bring potential CTE teachers to the field, and design comprehensive assessment tools to determine their preparation needs, and flexible programs to fill them”* (p. 30).

Bruening & Scanlon’s (2002) study was based on a mixed-method approach with the goal of identifying attributes of exemplary leading and innovative CTE teacher preparation programs. The researchers conducted a case study of five institutions identified as outstanding teacher preparation programs. Data were collected through administrative interviews, teacher preparation faculty members, on-site observations and focus groups with students and program graduates. The highest rated attributes of exemplary CTE teacher preparation programs included:

- Demonstrates partnering effectiveness with school administrators and teachers.
- Updates contents to be consistent with the evolving needs of workforce education.
- Is rigorous and equivalent in scope and depth to other (academic) teacher education programs.
- Has outcome standards in place that relate to curriculum, pedagogy, technology, student learning, and development.
- Integrates academics into career and technology programs.

- Has a strong base of subject matter including learning theory, work-based education, general education, and clinical experiences.
- Emphasizes inquiry and critical thinking.

The variety of teacher preparation programs in CTE raises a challenge for professional development. The many types of entry into the field imply differing levels of preparation and experiences of educators that will be difficult to address in professional development, especially for beginning teachers. A comprehensive professional development plan should include aspects to address the preparation of CTE educators and offer support for educators with varying levels of preparation.

CTE Teacher Induction Programs

Joerger & Bremer (2001) examined teacher induction programs, a professional development strategy designed to meet the needs of beginning CTE teachers. Their work was intended to be a resource for educators and education policymakers who wish to institute comprehensive and effective teacher induction programs designed to help ensure the success and retention of beginning CTE teachers. They define teacher induction as encompassing a teacher's experience from the signing of the first contract through establishing oneself as a competent, effective, professional teacher. Howey & Zimpher (1991) indicated that well-designed teacher induction programs can improve teacher competence, performance, and effectiveness by providing personal support, assessment and feedback, continuing education that builds on pre-service education and meets current needs, and positive socialization into the profession.

Areas of special need for CTE teachers include managing career and technical student organizations, concerns related to equipment and laboratories, including safety issues, adequacy of equipment, maintenance of equipment, ordering equipment, and developing or maintaining community support. Some of the identified needs of beginning CTE teachers can be addressed through induction programs while other areas could be included in pre-service education, such as the pervasive issues related to student discipline, student motivation, and classroom management.

Joerger & Bremer (2001) believe that if the focus of new teacher induction programs is solely on improving teacher competencies, there will be only small gains in teacher effectiveness, satisfaction, and retention. Because teachers operate within multiple systems, federal, state, union, district, and school, policies and practices impact their ability to function effectively. Changing the system and teaching environment can only address some of the problems and barriers identified by research on the needs of beginning teachers. For example, outdated equipment or a lack of textbooks should be addressed as a system issue at the school or district level. Similarly, good classroom management skills are most successful in an environment where teachers are supported by school discipline policies that are well thought-out and are consistently supported by school administration.

Joerger & Bremer (2001) also identified the importance of teacher induction programs as a part of comprehensive professional development programs in CTE, *“Stakeholders in policymaking and administrative roles should be involved in the creation, support, and promotion of comprehensive professional development programs. Carefully designed teacher induction programs that specifically address the needs of beginning teachers should be created as the initial component of resident professional development programs”* (p. 17).

Heath-Camp, Camp, Adams-Casmus, Talbert & Barber, 1992) developed quality materials for establishing and implementing a comprehensive beginning teacher induction program that includes 11 components (pp. 30-34),

- Beginning teacher handbook
- Detailed orientation
- Structured mentor program
- Teacher peer support group
- Systematic administrative support
- Professional development center
- Professional development coordinator
- Certification courses
- Coaching in reflection
- Individualized professional development plan
- Ongoing inservice workshops

Sweeny (2002) brings together many of the best practices, research, and theory into a framework that can be used to tailor a quality induction program. It challenges school leaders to think beyond initial, short-term goals to a wider, long-term vision, providing advice to ensure development of highly effective practices that will improve teaching and learning.

Joerger & Bremer (2001) recommend that school administrators, legislators, teacher association leaders, and others who have influence upon the policies and practices of school operation and staff take action in order to optimize the beginning CTE teacher’s experience, including facilitating activities that foster the development of collegial relationships with teacher colleagues, creating convenient and clear ways for understanding complex school systems and policies, clarifying the process of formal observations and evaluations conducted by district personnel, providing quality facilities and materials for classroom and laboratory instruction, and serving as an advocate of beginning teachers and their programs.

Inservice Professional Development in CTE

Inservice professional development refers to opportunities for those currently teaching, as opposed to pre-service teachers in preparation programs. Wenglinsky (2000) studied the link between teacher quality and student achievement. The study

looked at classroom practices, professional development, and teacher inputs (e.g., salaries, bonuses, teacher qualifications). The study found that while all three aspects of teaching influence student achievement, the greatest role is played by classroom practices, followed by professional development that is specifically tailored to those classroom practices most conducive to the high academic performance of students. Wenglinsky found teachers who participated in sustained professional development were more effective, “...teachers who receive rich and sustained professional development generally, and professional development geared toward higher order thinking skills and concrete activities such as laboratories particularly, are more likely to engage in effective classroom practices” (p. 32).

Wenglinsky (2001) recommended that policymakers provide teachers with extended professional development opportunities covering classroom practice topics rather than limited weekend seminars. He also suggested providing rewards for teachers who carry what they learn in professional development sessions into the classroom. He concluded that inservice professional development was very important to improve a teaching force with varying levels of preparation, “...what really matters is not where teachers come from, but what they do in the classroom. And it is possible to make improvements in classroom practices with the current teaching force, irrespective of educational levels or other qualifications” (p. 32).

The International Technology Education Association (2005) focuses on professional development in a standards-based K-12 technology program. They argue that a comprehensive professional development plan should be flexible to remain current, “the content and processes of professional development will alter over time. These alterations should reflect the changing needs of the teachers and students in K-12 technology laboratory classrooms as well as the changing nature of technology” (p. 13). They recognize that teachers begin learning in general education courses, then continue in teacher preparation programs, student teaching experiences, as well in inservice education opportunities at the individual teacher level, school community and school district, and state or national level. However, they note it is important to recognize that opportunities should be “coordinated to promote professional development as a comprehensive program” (p. 18).

Loveder (2005) investigated strategies and practices used by technical education institutions worldwide to develop teachers’ professional experience as well as successful professional development models designed to maintain relevance going forward. He identified some of the factors impacting the extent and nature of professional development:

- New ‘client base’ of teachers is increasingly sophisticated and has high expectations.
- Move away from traditional delivery toward diversified training sites and just-in-time delivery.
- Intensification and expansion of work resulting in teachers increasingly needing to engage in their own learning at home and after hours.

- Diversified roles for CTE teachers require a new focus on acquiring skills beyond core teaching and learning competencies.
- ‘Knowledge work’ means that CTE teachers must adapt and tailor learning for increasingly complex learning environments.
- ‘Demographic challenge’ to capture the knowledge of those teachers leaving the system.

Loveder (2005) indicated that professional development not only plays an essential role in ensuring that CTE instructors keep current on developments in the teaching field and changes in technologies, it also plays important roles in staff and student attraction and retention, understanding new technologies and practices in the workplace and in introducing innovative teaching and learning practices in the classroom. He commented on the difficulty in completely defining professional development because of the intersection with many other professional practices including teaching standards, qualifications and other organizational change agendas.

There are seven broad themes around which CTE professional development has been clustered, including pedagogical expertise, learner focus, industry currency (balancing an understanding of generic employability skills with maintenance of technical knowledge in the teacher’s subject area), use of technology, client focus, CTE system expertise, and personal qualities. Loveder also summarized a range of different approaches to professional development used worldwide, including mentorship, communities of practice, back to industry programs, and information sites and databases (2005).

McGrath & Palmer (2004) recommend that institutions need to balance the needs of new teachers with those of existing staff. They also mentioned the need to pay greater attention to building the knowledge and expertise of non-specialist staff in non-teaching roles. Cort, Härkönen & Volmari (2004) commented on the expanding role of the CTE teacher to include guiding students in their educational choices. This work requires skills in counseling, performance management, administration, planning, conducting research and building partnerships and relationships that may require professional development opportunities. Cort et al. also suggested that engaging with industry partners is key to ensuring that classroom experiences prepare students for the workplace and make technical education relevant for industry (2004). They also recommend professional development featuring a ‘dualistic approach’, integrating practice and on-the- job learning in the practitioner’s classroom with theory; flexible, modular approaches to meet the needs and backgrounds of practitioners; and using a ‘bottom-up’ approach to encourage practitioners to reflect on their own teaching practice.

Given the variability of educational levels when CTE instructors enter teaching, CTE instructors may wish to attain a degree as part of their professional development. Further development of pedagogy and content knowledge should not be limited to the formal classroom,

...skills in the area of teaching and learning could be developed through professional development conferences, on-line courses, internships, mentor programs, workshops, or even work experiences. Technical content can be developed in the same manner, and also needs to be continually updated. This would impact national and state level professional organizations by creating a demand for these alternative forms to learn. The organization could play a role in the development and organization of many of the methods. (p. 21)

Bartlett stated, *“Thinking of new ways and processes to help teachers meet their goal of having students with high achievement is imperative.”* He noted that CTE teachers will achieve competency via different learning experiences due to differences in backgrounds and learning styles. He suggested that virtual learning centers could provide teaching and learning as well as technical content expertise in keeping students up-to-date. Twomey (2002) also presented the idea of a Virtual Teacher Training Center as a solution to teacher preparation and educational training designed to train persons with industry and field experience into educated and licensed CTE teachers.

Bartlett noted that standards are needed for assessment purposes, *“The standards in teaching and learning can be similar for all CTE areas. The technical content standards, however, will be different for each career cluster, and more specifically for each area within clusters”* (p. 16). He identifies several methods to assess CTE instructors including portfolios, resumes, teaching lessons and units, rubrics, observation, transcripts, self-reflection and national standards testing.

Szuminski (2003) posits that traditional mentoring and induction programs no longer meet the needs of today’s CTE teachers. She proposes meshing teacher education, mentoring, induction and professional development into one conceptual model called “teacher development.” This model *“becomes a more appropriate term and descriptor for the activities needed by the novice CTE teachers”* especially those entering in from industry. Szuminski presents five core components to foster success of teacher development programs: 1) partnerships with other schools and industry; 2) continuous emotional/psychological and instructional support; 3) job-embedded teacher development activities; 4) Administrative commitment to integrate the program and provide personnel, financial resources and time to support it; and 5) flexibility in program design and implementation.

Ruhland & Bremer (2002) examined professional development opportunities available to secondary academic and CTE teachers across the United States. The study data included survey responses from a random sample of 585 teachers from 28 states and described teaching experiences and professional development needs of recently certified CTE teachers. The study’s major findings included (pp. 49-50):

- Professional development practices and support from state or local school districts vary for traditionally and alternatively certified teachers among individual states. Mentoring (67%) was the most frequent state-wide professional development practice provided to new teachers. Half of recently

certified CTE teachers (51%) reported the availability of and use of a mentor during their first 6 months of teaching.

- Support services available and used during the first 6 months of teaching by over 50% of the recently certified CTE teachers included curriculum and instructional resources (72%), teacher handbook (60%), orientation to school's policies and procedures (59%), and mentor (51%).
- CTE teachers reporting a very positive to extremely positive (63%) teaching experience were more likely to continue in the teaching profession.
- The type of certification program completed did not influence a CTE teacher's likelihood to continue in the teaching profession.
- CTE teachers who participated in the telephone interview indicated a wide range of professional development needs, including peer-coaching, up-to-date technology and computer skills, workshops on curriculum development and working with special need populations.

There is overlap in the qualities of effective professional development, and recommendations for professional development in CTE. Bybee & Loucks-Horsley (2000) include four qualities to effective professional development in technology: a focus on learning and developing skills related to technology, learning how to teach technology, tools to continue learning and the motivation to do so, and long-term programs. They stress that a comprehensive approach is necessary to invoke teacher change,

...fragmentation plagues current learning opportunities for teachers: courses, workshops, and institutes are rarely coordinated or sustained over time so that teachers get both depth and breadth in what they need to know and be able to do. Long-term professional development programs, not just events, are required to support the kinds of changes required for the technological literacy standards to touch all students. (p. 32)

There is also still a difference between what the research shows to be effective, and the professional development that teachers are currently experiencing. The authors still see traditional methods of professional development, with "menu-driven" offerings, where teachers select from a variety of different workshops or courses that are not connected to each other. Bybee & Loucks-Horsley (2000) call on technology teachers to demand more long-term professional development, and for professional development providers to abandon their short-term workshops.

Comprehensive Professional Development in CTE

The Carl D. Perkins Career and Technical Education Act of 2006 proposes to develop the academic, vocational and technical skills of secondary and postsecondary students who elect to enroll in vocation and technical education programs with a variety of activities, including supporting partnerships among levels of education, and

improving the quality of career and technical education (CTE) teachers, faculty, administrators and counselors. The responsibility of providing comprehensive professional development programs to these audiences resides with the state leadership. The Perkins Act specifies that professional development should be *“high quality, sustained, intensive, and classroom-focused in order to have a positive and lasting impact on classroom instruction”* (p. 41).

Inservice and pre-service trainings funded by Perkins should cover effective integration and use of challenging academic and career and technical education, effective teaching skills, effective practices to increase parental and community involvement, and effective use of scientifically based research and data to improve instruction. It should *“encourage applied learning that contributes to academic and career and technical knowledge of the student”* and provide the *“knowledge and skills needed to work with and improve instruction for special populations”* (p. 41).

The official guide to the Perkins Act, published by the Association for Career and Technical Education (2006), includes items related to comprehensive professional development on their local and state checklists. The task at the local level reads,

Describe how the comprehensive professional development (including initial teacher preparation) for CTE, academic, guidance, and administrative personnel will be provided that promotes the integration of coherent and rigorous content aligned with challenging academic standards and relevant to CTE (including curriculum development. (p. 87)

The state role is similar, *“Describe how comprehensive professional development (including initial teacher preparation and activities that support recruitment) for CTE teachers, faculty, administrators and career guidance and academic counselors will be provided”* (p.81). The inclusion of a state role and a local role that are both related to comprehensive planning for professional development in the Perkins Act reflects the current focus on alignment of professional development opportunities and its perceived importance in CTE.

Summary

While there are not many resources that directly tie comprehensive professional development to CTE, many areas of the literature inform this topic, including research on effective professional development, comprehensive professional development in general including planning and implementation, and professional development in CTE including teacher preparation, induction and inservice opportunities.

The research on what constitutes effective professional development shows a high overlap with qualities of comprehensive professional development. There are a number of sources that recommend professional development should be sustained, ongoing, embedded, coherent and integrated. Comprehensive professional development would embody these features by definition, relating all professional development opportunities to a set of standards and goals.

Hirsh (2004) writes about the complexity of forming a comprehensive professional development plan which should include context, or policies to guide system planning and operations; process, procedures for developing action plans; and content, action plans that outline what adults will learn and do to achieve their goals. In creating a plan for comprehensive professional development, a broad-base of stakeholders should be involved (Kutner & Tibbitts, 1997). It is challenging to create buy-in from parties involved in implementing the professional development, such as school districts, and ensuring it is relevant to local needs so it is adopted by teachers (Kent, 2004; Dutro et al., 2002).

There are few studies of educational systems utilizing comprehensive professional development. Elmore & Burney (1999) showed large improvements in student performance in a school district that had long-term goals that guided sustained professional development opportunities. Coherent professional development experiences have been linked with improving teaching practices (Porter et al., 2000; Garet et al., 2001). A study conducted by Casserly (2002) found that school districts with comprehensive and coherent professional development opportunities had higher than average rates of student achievement. However, the professional development experienced by most teachers remains a selection of unrelated workshops and trainings (Farkas et al., 2003; Richardson, 2003). Finally, Wenglinsky (2000) found that teachers who participated in sustained professional development were more effective,

In CTE, professional development opportunities are important in keeping CTE instructors up-to-date on content and pedagogy (Loveder, 2005). Professional development is also valuable considering the varying levels of preparation and certification in the field (Bartlett, 2002). Joerger & Bremer (2001) argue that teachers, especially beginning teachers, also need to learn other skills such as how to operate within the systems in which they are hired, classroom management skills and student guidance. Comprehensive professional development would address teacher preparation, teacher induction and inservice teachers.

The recommendations for all levels of professional development in CTE are similar to the general recommendations for professional development; opportunities should be coordinated, long-term and flexible (Bybee & Loucks-Horsley, 2000; International Technology Education Association, 2005). The Perkins Act of 2006 detailed the state and district roles in supporting CTE and providing comprehensive professional development to promote rigorous content.

Overall, the literature related to comprehensive professional development and CTE shows evidence-supported effectiveness of the characteristics of comprehensive professional development and a need for such an approach in CTE areas. Overall, there is a lack of examples of comprehensive professional development implementation and evaluation.

References

- Anderson, S.E. (2003). The school district role in educational change: A review of the literature. International Centre for Educational Change, Ontario, Institute for Studies in Education. Retrieved on June 24, 2008 from <http://fcis.oise.utoronto.ca/~icec/workpaper2.pdf>
- Association for Career and Technical Education (2006). Perkins Act of 2006: The official guide. Alexandria, VA: Author.
- Association for Supervision and Curriculum Development. (2003, July). What professional development structures best affect classroom instruction? *Research Brief, 1*(15). Retrieved July 23, 2003, from <http://www.ascd.org/publications/researchbrief/volume1/v1n15.html>
- Bartlett, J. E. (2002). Preparing, licensing, and certifying postsecondary career and technical educators. Columbus, Ohio: The Ohio State University National Dissemination Center for Career and Technical Education. Retrieved September 18, 2008 from <http://www.nccte.org/publications/shop>
- Berman, P., & McLaughlin, M. W. (1975). Federal programs supporting educational change, vol. iv: The findings in review (No. R-1589/4-HEW). Santa Monica: Rand.
- Blank, M., Kershaw, C., Russell, R. and Bunch, S. (2008). Teacher quality: Shared responsibility and accountability for mentoring and induction. Paper presented at the annual meeting of the *American Association of Colleges for Teacher Education*, New Orleans, LA. Retrieved September 9, 2008 from http://www.allacademic.com/meta/p207394_index.html
- Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher, 33*(8), 3-15.
- Borko, H., Elliott, R., & Uchiyama, K. (2002). Professional development: A key to Kentucky's educational reform effort. *Teaching and Teacher Education, 18*, 969-987.
- Bruening, T.H., & Scanlon, D.C. (2002). Attributes and characteristics of exemplary, leading, and innovative career and technical education teacher preparation programs. Columbus, Ohio: The Ohio State University National Dissemination Center for Career and Technical Education. Retrieved September 18, 2008 from <http://www.nccte.org/publications/shop/>

- Bybee, R. W. (2001). Effective professional development for technology teachers. *Technology Teacher*, 61.
- Bybee, R.W. & Loucks-Horsley, S. (2000). Advancing technology education: The role of professional development. *The Technology Teacher*, 60(2), 31-34.
- Casserly, M. (2002, December 4). Can the Bush plan work? How to keep 'No Child Left Behind' from dissolving into its fine print. *Education Week*, 22(48), 38-39.
- Castellano, M., Stringfield, S., & Stone, J. R. III (2003). Secondary career and technical education and comprehensive school reform: Implications for research and practice. *Review of Educational Research*, 73(2), 231-272.
- Cook, C. & Fine, C. (1997). Critical issue: Finding time for professional development. *North Central Regional Education Laboratory*. Retrieved October 27, 2005, from <http://www.ncrel.org/sdrs/areas/issues/educatrs/profdevl/pd300.htm>
- Cort, P., Härkönen, A. & Volmari, K. (2004). PROFF: Professionalisation of VET teachers for the future. Luxembourg. Office for Official Publication of the European Communities.
- D'Ambrosio, B.S., Harkness, S.S., & Boone, W.J. (2004). Planning district-wide professional development: Insights gained from teachers and students regarding mathematics teaching in a large urban district. *School Science and Mathematics*, 104.
- Darling-Hammond, L. (1999, Spring). Target time toward teachers. *Journal of Staff Development*, 20(2). Retrieved January 2, 2006, from <http://www.nsd.org/library/publications/jds/darling202.cfm>
- Darling-Hammond, L. & McLaughlin, M. W. (1995). Policies that support professional development in an era of reform. *Phi Delta Kappan*, (76)8, 597-604.
- Deojay, T. R. & Novak, D. (2004). Blended data. *Journal of Staff Development*, 25(1).
- Desimone, L. M., Porter, A. C., Garet, M. S., Yoon, K. S., & Birman, B. F. (2002). Effects of professional development on teachers' instruction: Results from a three-year longitudinal study. *Educational Evaluation and Policy Analysis*, 24(2), 81-112.

- Dutro, E. L., Fisk, M. C., Koch, R., Roop, L.J., & Wixson, K. (2002). When state policies meet local district contexts: Standards-based professional development as a means to individual agency and collective ownership. *The Teachers College Record*, 104(4), 787-811.
- Education Alliance. (2005, February). Bridging the achievement gap: The role of professional development for teachers. Retrieved January 2, 2006, from http://www.educationalalliance.org/Professional_Development.pdf
- Elmore, R. (2002). *Bridging the gap between standards and achievement: The imperative for professional development in education*. Washington D.C.: The Albert Shanker Institute.
- Elmore, R. F., & Burney, D. (1999). Investing in teacher learning: Staff development and instructional improvement. In L. Darling-Hammond and G. Sykes (Eds.) *Teaching as the learning profession: Handbook of policy and practice*. San Francisco: Jossey Bass.
- Farkas, S., Johnson, J., & Duffett, A. (2003). *Stand by me: What teachers say about unions, merit pay and other professional matters*. New York, NY: Public Agenda.
- Fishman, B. J., Marx, R.W., & Best, S. (2003). Linking teacher and student learning to improve professional development in systemic reform. *Teaching and Teacher Education*, 19(6), 643-658.
- Garet, M. S., Birman, B. C., Porter, A. C., Desimone, L., & Herman, R. (1999). *Designing effective professional development: Lessons from the Eisenhower Program*. Washington, DC: Department of Education. Retrieved September 5, 2008 from <http://www.ed.gov/inits/teachers/eisenhower/index.html>
- Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal*, 38, 915–945.
- Guskey, T. R. (2000). *Evaluating professional development*. Thousand Oaks, CA: Corwin Press.
- Heath-Camp, B., Camp, W. G., Adams-Casmus, E., Talbert, B. A., & Barber, J. D. (1992). On becoming a teacher: An examination of the induction of beginning vocational teachers in American public schools. (NCRVE Publication No. MDS – 018). Berkeley, California: National Center for Research in Vocational Education.

- Hirsh, S. (2004). Putting comprehensive staff development on target: Professional development works best embedded in improvement plans. *Journal of Staff Development*, 25(1).
- Hirsh, S. (1997). Creating a seamless connection. *Results*. National Staff Development Council. Retrieved on June 24, 2008 from <http://www.nsd.org/library/publications/results/11-97hirsh.cfm>
- Hornbeck, M. (2003). What your district's budget is telling you. *Journal of Staff Development*, 24(3).
- Howey, K. R. & Zimpher, N. L. (1991). Restructuring the education of teachers. Reston, VA: Association of Teacher Educators. (ERIC Document Reproduction Service No. ED 330 649).
- International Technology Education Association. (2005). Developing professionals: Preparing technology teachers. [Addenda to Technological Literacy Standards Series]. *Advancing Technological Literacy: ITEA Professional Series*. Reston, VA: International Technology Education Association.
- Joerger, R. M., & Bremer, C. D. (2001). Teacher induction programs: A strategy for improving the professional experience of beginning career and technical education teachers. Columbus, Ohio: The Ohio State University National Dissemination Center for Career and Technical Education. Retrieved September 18, 2008 from <http://www.nccte.org/publications/shop/>
- Kedzior, M. & Fifield, S. (2004). Teacher professional development. *Education Policy Brief*. 15, May 2004, University of Delaware Education Research and Development Center.
- Keller, J. B. (2002). A systems perspective of professional development in a K-12 school district. Indiana University. Retrieved June 24, 2008 from http://www.indiana.edu/~istdept/R795/keller_dissertation_proposal.pdf.
- Kent, A. M. (2004). Improving teacher quality through professional development. *Education*, 124(3), 427-436.
- Killion, J. (2002). What works in the elementary school: Results-based staff Development (National Staff Development Council & National Education Association). Oxford, OH: National Staff Development Council.
- Kimmel, H., Deek, F. P., O'Shea, M., & Farrell, M. L. (1999). Meeting the needs of diverse student populations: Comprehensive professional development in science, math,

- and technology for teachers of students with disabilities. *School Science and Mathematics*, 99.
- Kutner, M & Tibbetts, J. (1997). Looking to the future: components of a comprehensive professional development system for adult educators. Washington, DC: Pelavin Research Institute.
- Lewis, M. V. (2001). Major Needs of Career and Technical Education in the Year 2000: Views from the Field. Columbus, Ohio: The Ohio State University National Dissemination Center for Career and Technical Education. Retrieved September 18, 2008 from <http://www.nccte.org/publications/shop/>
- Loucks-Horsley, S., Love, N., Stiles, K. E., Mundry, S. E., & Hewson, P. W. (2003). Designing professional development for teachers of science and mathematics (2nd ed.). Thousand Oaks, CA: Corwin Press.
- Loveder, P. (2005). World trends in staff development: Implications on the performance of technical education institutions. Paper presented at a *National Seminar: The Development of Technology and Technical-Vocational Education and Training in an Era of Globalization: 2005*. Kuala Lumpur, Malaysia. Retrieved September 20, 2008 from <http://www.ncver.edu.au/publications/1628.html>
- McGrath, S. & Palmer, R. (2004). The challenge of staff development for skills development. *Debates in skills development: reforming training for countries and agencies*, Working Group for International Cooperation in Skills Development, Turin.
- Marsh, J. A. (2000). Connecting districts to the policy dialogue: A review of literature on the relationship of districts with states, schools, and communities. Center for the Study of Teaching and Policy: University of Washington.
- Mundry, S. Spector, B., Stiles, K. & Loucks-Horsley, S. (1999). Working toward a continuum of professional learning experiences for teachers of science and mathematics. National Center for Improving Science Education: University of Wisconsin-Madison.
- Murphy, M. (2000). Designing staff development with the system in mind. *Results*. National Staff Development Council. Retrieved on June 24, 2008 from <http://www.nsd.org/library/publications/results/res9-00murp.cfm>
- Newmann, F. M., King, M. B., & Youngs, P. (2000). Professional development that addresses school capacity: Lessons from urban elementary schools. *American Journal of Education*, 108(4), 259-299.

- Penuel, W. R., Fishman, B. J., Yamaguchi, R., & Gallagher, L. P. (2007). What makes professional development effective? Strategies that foster curriculum implementation. *American Educational Research Journal*, 44(4), 921–958.
- Porter, A.C., Garet, M. S. Desimone, L., Yoon, K. S., Birman, B. F. (2000). Does professional development change teaching practice? Results from a three-year study. U.S. Department of Education, Doc # 2000-04. Retrieved on October 26, 2005 from http://www.ed.gov/offices/OUS/PES/school_improvement.html#subepdp1
- Richardson, V. (2003). The dilemmas of professional development. *Phi Delta Kappan*, 84(5), 401-406.
- Ruhland, K. & Bremer C.D. (2002). Alternative teacher certification procedures and professional development opportunities for career and technical education teachers. St. Paul, MN: University of Minnesota National Research Center for Career and Technical Education. Retrieved September 19, 2008 from, <http://www.nccte.org/publications/shop/>
- Smylie, M. A., Allensworth, E., Greenbert, R. C., Harris, R. & Luppescu, S. (2001). Teacher professional development in Chicago: Supporting effective practice. Chicago: Consortium on Chicago School Research. Retrieved on September 24, 2008 from http://ccsr.uchicago.edu/content/publications.php?pub_id=36
- Sparks, D. (2002). Designing powerful professional development of teachers and principals. National Staff Development Council. Retrieved September 23, 2008 from <http://www.nsd.org/library/leaders/sparksbook.cfm>
- Sparks, D. & Hirsh, S. (2000). A national plan for improving professional development. National Staff Development Council. Retrieved September 4, 2008 from <http://www.nsd.org/library/authors/NSDCPlan.cfm>
- Sweeny, B. (2001). Leading the teacher induction and mentoring program. Arlington Heights, IL. Skylight Training and Publishing Inc.
- Szuminski, K. (2003). Teacher development in CTE: Research brief. St. Paul: National Research Center for Career and Technical Education, University of Minnesota.
- Twomey, S.M. (2002) The virtual teacher training center: A one-year program to transform subject-matter experts into licensed career and technical education teachers. Paper prepared for the 2002 *National Career and Technical Teacher*

Education Institute. Scottsdale, AZ. Retrieved September 19, 2008 from <http://www.nccte.org/publications/inBriefs.html>

Wenglinsky, H. (2000). *How teaching matters: Bringing the classroom back into discussions of teacher quality*. Princeton, NJ: Educational Testing Service.

WestEd. (2000). *Teachers who learn, kids who achieve: A look at schools with model professional development*. San Francisco, CA: Author.