Chapter 3

Comprehensive Teacher Induction: What We Know, Don't Know, and Must Learn Soon!

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ABSTRACT: *Comprehensive teacher induction refers to those practices that help new and beginning teachers become competent and effective classroom professionals who also understand school and community cultures. Induction programs were designed to support new teachers and facilitate their socialization into the profession. Additionally, these programs were seen as productive ways to improve retention in the profession, refine instructional practice, and ultimately improve pupil learning. To date, induction programs have failed to accomplish such lofty educational goals. This article describes what educators know and don't know about comprehensive teacher induction and offers some general guidelines for improving both research and practice. The paper also describes the efforts at one regional state college to improve new and beginning teacher practice and to provide empirical evidence to support such efforts. The overall message is that comprehensive teacher induction can positively impact teaching practice and pupil learning; to do so, however, will require careful reconsideration of its conceptual, procedural, and empirical underpinnings.*

Too many American children are plagued by unacceptable educational outcomes, declared Secretary of Education Arne Duncan (2009). Almost one third of students drop out or fail to complete school on time, and only 60% of African American and Latino pupils graduate when expected. In many large cities, half or more of low-income teens drop out of school. Children who attend our neediest schools are likely to have the least qualified teachers, and over the next 4 years one third of our veteran teachers may retire. Duncan noted that teaching has never been more difficult or more important.

Yet these adverse outcomes and educational inequities are not new. Indeed, countless others have lamented America's academic decline, persistent

achievement gaps, and increases in disruptive and destructive student behavior (e.g., Abell Foundation, 2001; Ballou & Podgursky, 2000; Carnine, 2000; Coalition for Evidence-Based Educational Policy, 2002; U.S. Department of Education, 2002; Walker, Ramsey, & Gresham, 2003–2004). Educators were warned, as well, that persistent educational failure may lead ultimately to societal questioning of teacher education's efficacy and its sole right to prepare teachers (Greenwood & Maheady, 1997). Secretary Duncan (2009) commented soberly on these possibilities by noting that over 60% of teacher education graduates reported that their training programs did *not* prepare them adequately for work in contemporary classrooms. He went on to cite specific shortcomings in classroom and behavior management, working with high-needs students, and using data to improve instruction and student learning. A clear gap exists between the educational realities of P–12 schools and preparation efforts in many teacher education programs (Cibulka, 2009).

This is not to suggest that policy makers, teacher educators, and education leaders and researchers sat by idly while educational outcomes deteriorated. On the contrary, in the past 40 years numerous educational reforms were undertaken to improve pupil outcomes. Keyworth (2010) and States (2010) highlighted many of these structural reforms (e.g., increased funding for students; higher pay for teachers; more teachers with advanced degrees, credentials, and professional certifications; smaller class and school sizes; charter schools; vouchers; high-stakes testing; and school reform initiatives like Goals 2000 and No Child Left Behind) and noted that their overall impact on pupil learning has been disappointing at best. Despite massive increases in funding, smaller class sizes, more qualified and better credentialed teachers, and extensive state and federal legislative reforms, student achievement in reading and math has remained relatively stable over the past three decades, and the achievement gaps and differential graduation and drop-out rates among high- and low-income students have persisted or escalated.

Perhaps one of the most promising structural reform efforts to emerge in the past few decades is teacher induction. Educational leaders, researchers, and policy makers heralded induction and mentoring programs as indispensable vehicles for supporting new teachers, increasing retention in the profession, refining instructional practice and quality, and ultimately improving pupil learning (e.g., Alliance for Excellent Education, 2004; Arends & Ragazio-DiGilio, 2000; Fletcher, Strong, & Villar, 2008; Guarino, Santibanez, & Daley, 2006; Howe, 2006; Strong, 2005). For many, teacher induction and mentoring programs were seen as ways to bridge the gap between preservice education and the classroom and to help new teachers make a successful transition into the profession. Evidence suggested further that these programs were received favorably in schools and that they had a positive impact on teacher retention (e.g., Ehrich, Hansford, & Tennent, 2004; Ingersoll & Kralik, 2004). Yet, significant questions remain regarding the effects of induction programs on teaching

practice and student learning, the most salient variables in applied educational research.

This article describes what is known and isn't known about teacher induction and mentoring programs. These impressions were derived from an illustrative rather than comprehensive literature review and as such must be interpreted cautiously. The analysis examines conceptual, procedural, and empirical issues and discusses potential implications for policy makers, teacher educators, practitioners, and applied researchers. The remainder of the paper offers guidelines for improving induction research and practice and describes the modest efforts of a regional state university to do so. The overall message is clear: Comprehensive teacher induction *can* positively impact teaching practice and pupil learning; to do so, however, will require careful reconsideration of its conceptual, procedural, and empirical underpinnings.

PREVIOUS RESEARCH

Although teacher induction and mentoring emerged only during the past few decades, they have already generated extensive literature. A simple Google search, for example, yielded over 253,000 hits on the topics. In addition, at least 12 comprehensive reviews appeared in the general (Arends & Ragazio-DiGilio, 2000; Ehrich et al., 2004; Feiman-Nemser, Schwille, Carver, & Yusko, 1999; Gold,1996; Howe, 2006; Huling-Austin, 1992; Humphrey et al, 2000; Lopez, Lash, Schaffner, Shields, & Wagner, 2004; Wang, Odell, & Schwille, 2008; Whisnant, Elliott, & Pynchon, 2005) and special education (Billingsley, Griffin, Smith, Kamman, & Israel, 2009; Griffin, Winn, Otis-Wilborn, & Kilgore, 2003) literature. Here, we provide a working definition for comprehensive teacher induction, highlight its primary purposes and components, discuss the adequacy of the existing evidence base, and summarize conclusions and implications.

Comprehensive Teacher Induction: Defined

When examining the literature, the words "preservice and in-service teacher training," "induction," and "mentoring" appear frequently. Quite often the latter two terms are used interchangeably. There are, however, important distinctions among the terms that must be articulated initially. Induction programs, for example, were viewed as distinct *theoretically* from preservice and in-service preparation in that they did not provide additional training but rather offered support to new employees who had already been trained (Ingersoll & Smith, 2004). However, given that over 60% of new teachers reported being inadequately prepared when exiting their preparation programs, a fundamental

problem may exist between theory and practice. School districts, for example, may have spent significantly more time "backfilling" for what was not taught in teacher education programs and as a result failed to attain their extensive goals. Induction was also conceived as a *broader developmental process* than teacher training, a process that served as a bridge from "student of teaching to teacher of students" (Ingersoll & Smith, 2004; p. 29).

Mentoring, on the other hand, was defined more narrowly as one-on-one assistance and support given by experienced professionals to novice educators (American Association of State Colleges and Universities [AASCU], 2006). The emphasis here was on the *personal guidance* that veteran teachers could provide for their novice colleagues (Ingersoll & Smith, 2004). Most often, mentoring was seen as one component of a more comprehensive approach to beginning teacher support and development (i.e., induction). Darling-Hammond & Sykes (2003) noted that although induction was often associated with mentoring, it also encompassed careful hiring procedures, protected initial assignments, steady provision of mentor and other support, and improved evaluation to help novices.

The term "comprehensive teacher induction" emerged from a national report by the Alliance for Excellent Education (2004). This document emphasized the broader and more comprehensive nature of induction and identified the following critical components: (a) high-quality mentoring, (b) shared planning time and collaboration, (c) ongoing professional development, (d) participation in an external network of teachers, and (e) standards-based evaluation. High-quality mentoring typically meant carefully screened and trained mentors selected from common disciplines who expressed interest in helping novice colleagues. Ample time to meet and plan instruction, observing one another's teaching, and ongoing administrative support were also seen as essential to successful induction programs (Arends & Rigazio-DiGilio, 2000; Barlin, 2010).

Additionally, AASCU recommended that professional development curricula and activities be geared to individual novice needs and that ongoing feedback be provided throughout the induction period (AASCU, 2006). In this paper, comprehensive teacher induction is defined as *those practices that help new and beginning teachers become competent and effective classroom professionals who also understand school and community cultures*. A distinction is made as well between *beginning* teachers who are in their first year of teaching and *new* teachers who have previous teaching experience but are in their first year in that school system. A tabular display of what does and does not constitute comprehensive teacher induction is provided in Table 1.

Table 1
Comprehensive Teacher Induction: What It Is and What It Is Not

Comprehensive teacher induction is...	**Comprehensive teacher induction is not…**
High-quality mentoring from trained mentor in common discipline	Part-time, informal guidance from untrained and often overextended colleague
Shared planning time and collaboration	No shared release time for collaboration and planning
Ongoing and targeted professional development	General professional development activities not linked to new teacher needs
Participation in an external network of teachers (i.e., professional learning community	Relative isolation of new teachers from their more experienced peers
Explicit administrative support	Unknown or unspecified support; giving difficult assignments (out-of-discipline subject matter, extracurricular duties, or multiple preparations)
Standards-based evaluation	Informal and/or summative, or no evaluation
Reduced course preparation and limited extracurricular activities	

Comprehensive Teacher Induction: Purposes, Components, and Benefits

Comprehensive teacher induction is a multifaceted and multipurpose process that can potentially benefit students, teachers (novice and experienced), administrators, policy makers, and the community. Table 2 highlights purposes, components, and potential benefits associated with comprehensive teacher induction programs. Administratively, induction is seen as a constructive policy response to problems of teacher turnover and the inadequate preparation of preservice teachers (Glazerman et al., 2008). Providing new and beginning teachers with the ongoing support and guidance of more experienced colleagues makes a lot of sense to practitioners and administrators alike. Experienced teachers have an opportunity to share their professional wisdom and expertise, and novices can learn the ropes from their more successful colleagues. Induction programs are also seen as ways to socialize new teachers into the profession, improve their teaching practice, reduce teaching-related stress and frustration, navigate unwritten district policies, and ultimately improve pupil learning. This represents a tall order for one reform effort, even when implemented under ideal conditions.

The literature suggests, however, that teacher induction programs are often implemented under less-than-ideal circumstances. AASCU (2006) reported that there is little consistency in induction programs across schools, districts,

Table 2
Primary Purposes, Components, and Potential Benefits Associated With Comprehensive Teacher Induction

Primary purposes of comprehensive teacher induction	Major program components	Potential benefits to mentors, mentees, school, and community
Improve teacher performance	Preorientation and orientation sessions that describe teaching assignments; curriculum and resources; historical and cultural information; community and regional culture; salary and benefits	**Benefits to students:** Improved teacher performance; higher academic achievement; improved continuity of instruction; enhanced class and school climate
Retain competent teachers in the profession	Systematic and sustained supports including formal mentor program; new and beginning teacher communication network; team planning/teaching; resource files; master teacher observations; study groups; resource personnel	**Benefits to new and beginning teachers:** Accelerated instructional success and effectiveness; greater self-confidence; enhanced job satisfaction; improved personal and professional well-being (e.g., reduced stress and frustration); increased opportunities for making connections with faculty, staff, and community; improved level of comfort and support
Promote the professional and personal well-being of new and beginning teachers	Targeted professional development with content most needed by new and beginning teachers. Activities might include workshops; formal course work with or without university involvement; online learning; committee work; staff meetings; research; curriculum development projects	**Benefits to mentors:** Development of leadership skills; increased professional growth and job satisfaction; enhanced collaboration skills; enhanced self-image; more opportunities to share instructional expertise
Build a foundation for continued professional growth	Explicit administrative support that might include protected initial teaching assignments (e.g., minimum preparation, teaching in areas of strength, no extracurricular assignments); formative and standards-based evaluation procedures	**Benefits to administrators:** Improved principal and teacher interactions and relationships; retention of presumably competent teachers
Transmit school and community culture	Orientation to district and school policies and procedures; participation in school-community events; membership on school climate committees	**Benefits to school and community:** Collegial communication network designed to facilitate interactions among experienced and new teachers; retention of competent teachers; increased student success; enhanced understanding of local community and culture
Socialize new teachers into the teaching profession		
Improve pupil learning	Staff development activities related to curriculum- and instruction-related practices; ongoing pupil progress monitoring; and structured, decision-making policies and practices	**Benefits to students:** Better academic and behavioral performance; greater access to advanced coursework; access to higher education and scholarship; improved life circumstances **Benefits to teachers, administrators, and community:** Direct evidence of teacher impact on pupil learning; better instructional decision making; well-educated community members

and states. Some programs are limited to one-on-one informal mentoring designed simply to help new teachers "survive" their first year, whereas others include carefully selected and trained mentors, systematic professional development, explicit instructional feedback, and formative evaluation procedures. Implementation efforts have also been hampered by a lack of ongoing administrative support, undertrained and overextended mentors, and inadequate and unstable funding patterns. Glazerman et al. (2008) noted that the most common arrangement was the pairing of new and experienced teachers without training, supplemental materials, or release time for induction. Potential benefits of any intervention are hampered in the presence of such implementation barriers.

One reason that school districts may not offer more support to new teachers is that comprehensive teacher induction is expensive (Alliance for Excellent Education, 2004; Villar & Strong, 2007). Induction programs were estimated to range from $1,660 to $6,605 per teacher per year. Moreover, there is not compelling evidence that investing more resources in comprehensive teacher induction will attract and retain more competent teachers than less expensive, informal mentoring alternatives. Finally, there are immeasurable costs associated with removing experienced teachers from their own classrooms to help others that may serve as disincentives. Villar and Strong (2007) conducted a systematic benefit-cost analysis and concluded that increases in teacher effectiveness, which presumably would result from comprehensive induction, could yield greater savings for school districts over the costs normally associated with teacher attrition. Collectively, the literature suggests that educators still lack commonly agreed-upon definitions for induction and mentoring. Those programs that do exist vary greatly in intensity and potential utility and as such cannot be viewed as common interventions or practices. Challenging economic times may further hamper efforts to move the field forward.

Despite definitional confusion, multiple and potentially competing purposes, and extreme program variability, induction and mentoring programs have increased dramatically. The number of new teachers who received some form of formal induction and mentoring expanded considerably over the past two decades (Smith & Ingersoll, 2004). During the 1990–1991 school year, 40% of beginning teachers said that they had participated in a formal teacher induction program. By 1993–1994, this participation rate increased to 51% of all new teachers in public schools, and by the 1999–2000 school year, the percentage of new and beginning teachers engaged in induction and mentoring programs reached 79%. Given such growth rates, one would predict that at least 90% of all new and beginning teachers in our public schools are currently involved in some form of induction program. This is important because induction and mentoring programs have been institutionalized to some extent in schools, and they may provide a necessary infrastructure for addressing the formidable educational challenges delineated by Secretary Duncan (2009). If these programs

can be implemented effectively and efficiently, then they may provide a viable mechanism for improving teacher practice and student learning.

Evidence of Effectiveness

The obvious question confronting education professionals is, do comprehensive teacher induction programs work? That is, do they increase teacher retention, facilitate socialization into the profession, improve new teachers' practice, and ultimately enhance pupil learning? The literature (e.g., Fletcher et al., 2008; Ingersoll & Kralik, 2004) suggests generally that comprehensive teacher induction does improve teacher retention under certain conditions (e.g., adequate administrative support, use of well-selected and well-trained mentors from common disciplines, and sufficient opportunities for novice educators to participate in instructional decision making), and that most participants are satisfied with their induction-related experiences. Unfortunately, the literature is much less clear about induction's impact on teaching practice and pupil learning. These topics have received considerably less attention, and outcomes have been modest at best. Unambiguous interpretations of the literature are hampered, as well, by an overall lack of methodological rigor (Ehrich et al., 2004; Humphrey et al., 2000; Johnson, Berg, & Donaldson, 2005). Table 3 highlights some primary limitations associated with induction research.

Table 3
Primary Limitations in Existing Research on Comprehensive Teacher Induction

1. Use of research designs that cannot establish functional relationships (i.e., qualitative versus quantitative methodologies).
2. Overemphasis on retention and satisfaction outcomes and underemphasis on teaching practice and pupil learning.
3. Almost exclusive use of indirect (e.g., opinion and attitude surveys) rather than direct outcome measures (e.g., observation and achievement measures).
4. Failure to quantify independent variables (i.e., nature of mentoring content and pedagogy) and to measure fidelity of implementation.
5. Selection bias and lack of internal controls in evaluative and quantitative studies.
6. Typical lack of direct observational measures of novices' teaching practice and/or formative measures of pupil performance.

According to research reviews (Ingersoll & Kralik, 2004; Lopez et al., 2004; Totterdell, Woodroffe, Bubb, & Hanrahan, 2004), most teacher induction studies were inconclusive and/or lacked appropriate rigor. To begin, most studies were qualitative rather than quantitative and, therefore, could not answer the types of cause-and-effect questions raised regarding induction efficacy. Moreover, induction researchers have relied heavily on indirect (e.g., attitude and other self-report methods) rather than direct measures of teacher and pupil performance (e.g., direct observation and student achievement). Ehrich et al. (2004), for example, noted that the literature was dominated by professional testimonials and personal opinions. Positive study outcomes included receiving empathy, getting good ideas for teaching, discussing strategies with peers, and getting feedback on one's teaching. Veteran and novice teachers generally liked their experiences and felt that they were helpful for professional growth.

Johnson et al. (2005) reported further that most quantitative induction studies were also limited by *selection bias* and a *lack of control groups*. Since schools that had induction programs were more likely to support teachers in other ways, they would also be more likely to retain them even without induction programs (i.e., selection bias). The failure to include control groups precluded researchers from ruling out typical professional growth as a contributor to subsequent induction outcomes. Conventional wisdom suggests that teachers normally improve their practice during the first 3 to 5 years of teaching (Lopez et al., 2004). Whether or not comprehensive induction programs can accelerate this growth cannot be answered without more rigorous research methods.

The limitations in the induction literature are most troubling with regard to impact on teaching practice and pupil learning. Humphrey et al. (2000) noted that student achievement was the *least* studied outcome in induction research. What may arguably be the most important outcome for professionals and parents (i.e., improvement in student learning) appeared to be the least studied induction outcome. Equally distressing was researchers' failure to view teaching practice as a necessary mediating variable in pupil learning. It was rare, indeed, for researchers to measure directly novice teachers' instructional practice before, during, and after induction training. In fact, teaching practice was an underrepresented dependent variable in most induction research. This generalized failure to measure teaching practice makes it virtually impossible to determine induction's impact on pupil learning (Goe & Coggshall, 2007).

To address inadequacies in the induction literature, the Institute of Education Sciences (IES) funded a 3-year, randomized control trial (Glazerman et al., 2008; Isenberg et al., 2009) to examine the impact of traditional versus comprehensive teacher induction programs on five dependent measures: (a) teaching practice, (b) student achievement, (c) teacher retention, (d) process-related variables (e.g., amount of time working collaboratively), and (e) composition of district work forces. Research-related questions, procedures, and outcomes are summarized in Table 4. The study involved 17 school districts,

Table 4

Research questions, designs, and outcomes associated with three-year, IES-funded, randomized control trial study

Research Questions	Participants and Settings	Independent Variable	Dependent Variables	Outcomes
What is the effect of comprehensive teacher induction on the types and intensity of induction services teachers receive compared to the services they receive from the districts' current induction programs?	17 school districts across 13 states; All districts had at least 50% of pupils who qualified for free and/or reduced meals;418 schools: 100 treatment and 103 control school in 9 ETC districts;110 treatment and 105 control schools in NTC districts; Classroom practices data collected on 698, K–6 teachers in self-contained classes; Formal test scores collected for 261 language arts and 281 math teachers	Comprehensive teacher induction included: Carefully selected and trained mentors; On average, 1 mentor worked with 12 novice teachers; curriculum of intensive and structured teacher supports; Direct observations in mentor classes; Formative assessment tools for novice and experienced teachers' Outreach for district leaders; explicit focus on instruction	Participant demographic variables; Direct observations of novice practice using the Vermont Classroom Observation Tool (VCOT); Student achievement on district-adopted measures; Teacher mobility surveys	Noticeable impact on induction-related process variables (e.g., treatment teachers reported receiving more mentoring than control teachers; treatment teachers participated in more specific induction activities than control teachers; treatment teachers spent more time in certain professional activities (e.g., keeping written journals, working with study groups, and observed others' teaching more often) during year 1; fewer significant effects reported during year 2;
What are the impacts on teachers' classroom practices?				No impacts on teaching practices during 1st and 2nd year
What are the impacts on student achievement?				No positive impacts on student achievement during 1st or 2nd year
What are the impacts on teacher retention?				No impacts on teacher retention after 1st and 2nd years
What is the impact on the composition of the district's teaching workforce?				No positive impacts on districts teacher composition after 1st and 2nd year

serving primarily low-income students, across 13 states. All the districts had at least 50% of pupils who qualified for free and/or reduced-cost meals. Roughly half of all teachers in each district received "typical" or existing induction services (i.e., control group) while the other half received comprehensive induction services (i.e., experimental group) that were developed by the Educational Testing Service (ETS) or New Teacher Center (NTC).

Methodologically noteworthy in the IES study were the explicit descriptions of induction services and the direct measurement of fidelity of implementation. Findings from the first 2 years were disappointing. Although some noticeable impact was reported on process-related variables (e.g., frequency of mentor-mentee contacts), no effects were found on teaching practice, student achievement, teacher retention, and/or composition of district work forces. A more recent *Education Week* article (Sawchuk, 2010) reported, however, that a third-year IES evaluation showed modest improvements in pupil achievement as a result of comprehensive teacher induction.

Summary and Conclusions

Collectively, what do educators know about comprehensive teacher induction? Induction and mentoring programs can be found in most public schools across the country, yet there is little consistency in what they look like from place to place. These programs are quite costly but may actually save money for school districts in the long run (Villar & Strong, 2008). Some evidence suggests that comprehensive induction increases teacher retention and that participants are typically satisfied with the training and support they receive. On the other hand, there is insufficient evidence to suggest that induction programs improve teaching practice and even less to show that student learning is improved. Conventional wisdom suggests that comprehensive induction programs will persist in our schools in one form or another. The fact that they have not impacted teaching practice and pupil learning should stimulate educators' collective efforts to demonstrate how they can do so.

Unfortunately, more remains unknown than known about comprehensive teacher induction. How do educators answer the basic question, do induction programs work? If they qualify their answers to include only retention and participant satisfaction, then they might respond affirmatively. However, if they examine issues of practice and learning, then their response is less clear or confident. We must ask, as well, is increased retention in itself a sufficient outcome or should retention be linked to improved pupil learning? In the absence of efficacy data, will schools end up retaining ineffective teachers? Should experienced teachers continue to "mentor" novice colleagues even if their efforts do not impact practice and pupil learning? Are the costs associated with removing highly effective veteran teachers from the classroom worth the benefits of

improved retention and satisfaction? Would better induction programs improve practice and student learning? If so, what should be included in these better induction programs? If not, should new teachers still be supported?

If comprehensive teacher induction provides a viable infrastructure for improving instructional practice and pupil learning, then what knowledge and skill bases are most relevant and how should they be imparted to novice teachers? Do different types of new teachers (e.g., primary, intermediate, and secondary; general and special education; and traditional and alternative certification) need different knowledge and skills? Or do all new teachers need a common knowledge and skill base to improve pupil learning? With regard to mentoring, do structures exist in districts to identify mentors who are unusually effective in improving pupil learning? How can highly effective teachers be convinced to leave their classrooms, and will there be any instructional costs to pupils? Can replacing highly effective teachers with unproven instructors be justified?

Empirically, would better research methods improve induction outcomes? Can more direct measures of practice and pupil learning be used effectively and efficiently in induction research and practice? What roles, if any, can single-case research designs play in documenting induction outcomes? Finally, for those in teacher education, what roles should preparation programs play in comprehensive teacher induction? Can teacher educators and P–12 personnel share induction roles and responsibilities, and, if so, in what ways? Can formal induction-related experiences begin earlier in preservice preparation, and what would that look like? Can preservice teachers learn to assess and adjust their own practices in response to ongoing measures of pupil performance?

THE SOLUTION

As noted, there are many unanswered questions in the induction literature. Here, we argue that comprehensive induction programs can have a more visible impact on practice and learning if major changes occur in how these programs are conceptualized, implemented, and evaluated. Greenwood and Maheady (1997) offered three plausible explanations for educators' inability to noticeably improve practice and learning: (a) failure to use existing technologies to measure *changes* in pupil learning, (b) inability to use research methods that were linked *directly* to student learning, and (c) an overreliance on advocacy rather than research to guide educational reform efforts. We reiterate the importance of these ideas and suggest that they undergird future efforts to refocus induction programs in schools. Here, we offer six basic guidelines for improving induction research and practice (Table 5) and provide three examples of

Table 5
Primary Limitations in Existing Research on Comprehensive Teacher Induction

1. Make teaching practice and pupil learning the overarching goals of comprehensive teacher induction programs, and measure them directly.
2. Reconceptualize teacher induction as an ongoing performance feedback system for all education professionals.
3. Align content and processes in induction around evidence-based knowledge and skills.
4. Use more rigorous research methods.
5. Use comprehensive induction programs as vehicles for bridging the research-to-practice gap in education.
6. Link teacher education programs and P–12 schools in the collaborative design, implementation, and evaluation of comprehensive induction.

how teacher educators, researchers, and school personnel have worked collaboratively to improve teacher practice and pupil learning.

Guidelines for Improving Research and Practice

Perhaps the most fundamental change is to make improved pupil outcomes—academic and behavioral—the overarching goal of induction efforts. Induction works only if and when pupil performance improves as a function of comprehensive induction services. To date, participant satisfaction and retention have taken precedence over pupil learning and improved teaching practice. These priorities must be reversed in future research and practice. While retention and satisfaction are important outcomes, their utility is linked directly to whether or not children benefit from their teachers' instruction. Retaining ineffective and satisfied teachers is not an acceptable outcome; nor is retaining effective teachers who are dissatisfied with existing working conditions. The highest priority, therefore, must be to retain well-satisfied teachers who are unusually effective in promoting pupil learning. Elevating better pupil outcomes to the forefront of induction research and practice will also require the development and identification of more and better progress-monitoring systems and empirically supported teaching practices.

It would also be useful to reconceptualize comprehensive teacher induction as one component of a larger professional development system in which *all* educators receive ongoing performance feedback and support for improving pupil outcomes. While novice teachers may need additional monitoring and support, such assistance can be provided in a system that recognizes and rewards suc-

cess and addresses instructional challenges in a proactive and constructive manner. While the exact nature and structure of such systems are not complete, noteworthy exemplars can be found in mental health (Chorpita, 2008; Fixsen, Blasé, Duda, Naoom, & Van Dyke, 2008), positive behavioral support (Sugai & Horner, 2008), and school psychology (Tilly, 2009) literature. In effect, a roadmap to evidence-based education in schools must be created (Detrich, Keyworth, & States, 2008). The fundamental purpose of induction (i.e., improving pupil learning), therefore, will be aligned with broader, systemwide policies and practices to support all personnel for improving student learning. If pupil learning drives instructional decision making, then comprehensive induction services must contribute positively to the schoolwide agenda to make better educational decisions about children, particularly the most fragile learners.

A third important guideline is to align induction content and pedagogy with empirically supported practices. There are glaring omissions throughout the induction literature regarding what was taught to novice teachers and how such instruction was provided. When content was described it was typically in generalities such as "classroom management," "assessment and instruction," "inquiry-based approaches to learning," and "school-related policies and procedures." Pedagogy was described similarly as "informal information sharing sessions," "weekly meetings," "mentor observations," and/or "written teaching summaries." There was no mention that mentors modeled and/or provided systematic feedback on novice teachers' use of empirically supported practices. One major problem for researchers and practitioners is that the literature provides very little guidance about what content to include in induction programs and how to transform this knowledge into teaching practice. The good news is that some educational practices are more effective than others and that, whenever possible, these practices should be used over those without comparable evidence. Indeed, scientifically based practices are mandated by federal legislation (e.g., No Child Left Behind; Individuals with Disabilities Educational Improvement Act) and serve a consumer protection function for educators (Detrich, 2008).

One important criterion for induction content might be the following: *Curricular programs and instructional practices that are used in induction programs should have empirical support*. Several analyses (Holdheide & Reschly, 2008; Oliver & Reschly, 2007; Smartt & Reschly, 2007) identified a number of empirically supported practices in reading, mathematics, and classroom organization and management and examined their relative use in teacher education programs. These initial assessments were quite sobering and suggested that many, perhaps most, teacher education programs were *not* promoting the use of empirically supported practices among new teachers. Teacher educators' failure to promote practices that benefit children are clearly reflected in Secretary Duncan's comments about new teachers' ill-preparedness for contemporary classrooms.

Equally important as *what* is taught in induction programs is *how* that content and skill base are delivered. The good news once again is that more is known about how to change teaching practice than is employed in school-based professional development. Educators know, for example, that lecture-based, in-service training does little, if anything, to change practice. In contrast, in-class assistance in the form of modeling, coaching, and performance-based feedback does help teachers to improve their instruction (e.g., Buysse & Wesley, 2006: Joyce & Showers, 2002). Odom (2008) also described a variety of hot topics at the forefront of contemporary professional development. These topics included practice-based reviews of evidence, implementation science, and the use of enlightened professional development activities (e.g., peer coaching, web-based video and visual access, and communities of practice) to improve teaching practice. Combining empirically supported content with scientifically validated professional development strategies provides a potentially constructive framework for changing practice at the classroom, school, and system levels.

It is also obvious that induction practice will not improve much until the quality of research that undergirds its use improves as well. Currently, the literature is dominated by qualitative and quantitative studies that lack rigor and do not address directly or adequately the issues of practice and pupil learning. Even the most rigorous, experimental effort to date (IES-funded, randomized control trials) has not produced meaningful outcomes for policy makers, researchers, or practitioners.

A fourth guideline, therefore, is to use more rigorous research methodologies, preferably those that can be adapted to local, consumer-driven interests and needs and can provide meaningful opportunities for replication and wide-scale dissemination. Single-case research designs provide one powerful way for practitioners to demonstrate the effects of explicit teaching practices on educationally important and reliably measured instructional outcomes (Kennedy, 2005). These designs require that induction strategies and outcomes be defined operationally and measured for fidelity of implementation and reliability of outcomes. Pupil performance is assessed across adjacent phases where interventions are present or absent, and determinations are made about the success or failure of different teaching practices. The value in single-case research lies in its sensitivity to behavioral change, the rigor of its measurement systems, and its flexibility for application at the student, classroom, school, or system levels (Kennedy, 2005).

The use of single-case research designs may also help to bridge the gap between research and practice in education. Single-case designs allow teachers to study issues of practice at the child and classroom levels and permits administrators to examine similar issues at the school and district levels. Some induction programs also require novice teachers to engage in formal professional development activities that document their abilities to improve pupil learning. Single-case research designs would be particularly useful for meet-

ing such professional requirements and producing a useful database on effective and ineffective practices in local schools. Indeed, some states are already mandating that teacher reappointment and tenure be linked to improved pupil performance.

The final guideline is that teacher preparation programs should work collaboratively with P–12 schools in the creation of new, data-based decision-making cultures in the schools. To do so, teacher educators must become more involved and responsive to the needs of public schools. A first step in that direction may have been the searing indictment of existing practice by top administrative officials (Duncan, 2009). A second step was reflected in comments from the president of the National Council for the Accreditation of Teacher Education. Cibulka (2009) said that teacher educators must create seamless transitions between preservice and in-service education, wrap their university coursework around P–12 educational needs, and substantially increase future teachers' clinical experiences. Those additional teaching opportunities were to be (a) intensive, (b) provided in our neediest schools, and (c) accompanied by data collection efforts that showed their impact on pupil learning.

Evidence of Effectiveness

We have been engaged to varying degrees in induction-related activities for almost 20 years now. Both of us have taught methods courses at the undergraduate and graduate levels, provided professional development to elementary and secondary teachers, and conducted research on the impact of empirically supported practices on pupil learning and behavior. Our audience has been primarily general education teachers, many of whom were in their first years of teaching. Their challenges, similar to those of most teachers, included accommodating the wide range of skill levels in their classes, increasing student productivity and accuracy, and solving a myriad of behavioral and interpersonal conflicts every day. They all had mentors, some of whom were more helpful than others. They received generic professional development, often delivered in workshops, and were required to earn a master's degree within 5 years of initial program completion.

Here, we describe three partnership projects that examined novice teachers' abilities to use empirically supported practices in real-life settings and to collect data on the effects of their instruction on pupil performance. These projects are offered as exemplars of the kind of collaboration needed to improve induction research and practice.

Preservice teachers' use of empirically supported practices

This project involved large groups of freshmen and sophomores who were completing their first formal field experiences in an inclusive general education program (Maheady, Jabot, Rey, & Michielli-Pendl, 2007). As part of course requirements, preservice teachers taught two formal lessons, collected pre- and postteaching data, graphed those data to reflect entire class, small group, and individual pupil performance, and then made written data-based instructional decisions. As part of the project, preservice teachers were also required to use one of six empirically supported practices (response cards, Numbered Heads Together, guided notes, graphic organizers, 3-step interview, and think-pair-share) and to collect data on the fidelity with which the selected practices were implemented. All student teachers were assigned to 10-week placements in pairs. They shared instructional planning, implementation, and evaluation responsibilities and were required to formally collect fidelity and outcome data. A total of 422 preservice teachers, 78% of whom were placed in high-needs schools, provided almost 17,000 hours of in-class assistance over four semesters. They taught more than 800 lessons and used empirically supported practices with a high degree of accuracy (M = 92%; range = 88% to 96%).

Pupil outcome data indicated that students made noticeable or marginal improvements in over 85% of preservice teachers' sampled lessons. Outcomes were determined on the basis of pupil improvements on pre- and postteaching assessments. Social validity data indicated that preservice teachers found their early teaching opportunities to be very important and useful. They also rated all project requirements as acceptable and reported high levels of satisfaction with program outcomes. This project was noteworthy because it was a collaborative arrangement between teacher educators and P–12 schools that produced mutual benefits for preservice and classroom teachers as well as the students they served. For teacher educators, it also provided an opportunity to measure *directly* novice teacher practice and its impact on pupil learning.

Preparing Student Teachers To Use Classwide Peer Tutoring

The second project (Maheady, Harper, Mallette, & Karnes, 2004) involved 10 preservice general educators who volunteered to use classwide peer tutoring (CWPT) (Delquadri, Greenwood, Whorton, Carta, & Hall, 1986) during their final student teaching experience. All student teachers were trained to implement CWPT with a high degree of accuracy using both on-campus and in-class assistance. Overall, it took about 2 hours of initial training, including 1 hour of in-class assistance (i.e., modeling, performance feedback, and coaching) to help preservice teachers reach a preestablished fidelity criterion. While they used CWPT, pupils' weekly spelling scores averaged 94%

(pretest M = 69%; range 52% to 89%) and only 8 out of 1,028 spelling tests administered resulted in failing grades. Further analyses revealed that preservice teachers implemented CWPT with a high degree of accuracy (M = 88%; range = 82% to 96%), but that they made some procedural adaptations at their classroom teachers' request. These procedural adaptations resulted in smaller achievement gains and less pupil satisfaction, an outcome that suggests caution when adapting empirically supported practices. This project provided a second example of how teacher educators might impact preservice teachers' practice and simultaneously examine the effects on pupil learning. The study also highlighted the importance of procedural adaptations and their potential impact on pupil performance and satisfaction.

Graduate Research-To-Practice Studies

The third partnership project was a graduate-level requirement for all teachers completing their master's degree in curriculum and instruction. The graduate program had a required 9-hour research sequence designed to help practitioners understand, design, and implement applied educational research. During the second course, novice teachers designed a single-case research study using guidelines articulated by Horner and colleagues (2005). They then carried out the project in either their own or other teachers' classrooms during the third course in the sequence. All research-to-practice studies included (a) identification of educationally and/or socially important problems; (b) brief and illustrative literature reviews; (c) operational definitions of target behaviors; (d) direct, frequent, and reliable measurement of target behaviors; (e) selection of empirically supported practices and direct measurement of intervention fidelity; (f) use of rigorous research designs (e.g., A-B-A-B, multiple baseline, and alternating treatments); and (g) assessment of social acceptability of intervention goals, procedures, and outcomes.

Here, we provide one example of a recently completed research-to-practice study. This particular study was completed by a first-year teacher working in a large urban setting in northeastern Ohio (Hiller, Maheady, & Jabot, 2010). The investigator taught a combined fifth- and sixthth-grade class with 18 students with a wide range of reading (second- to ninth-grade levels) and math (second- to seventh-grade levels) skills. In addition, many pupils had documented behavior problems and poor homework completion rates. When they did complete homework, their performance was below average. The investigator developed an intervention called the "mystery motivator game," which consisted of three primary components: (a) interdependent and dependent group contingencies, (b) spinners, and (c) unknown rewards in the form of mystery motivators (Rhode, Jenson, & Reavis, 1996).

First, the students were told that they were going to play a game designed to

improve their homework performance. To win, they had to meet two criteria: (a) 100% homework completion and (b) 85% homework accuracy. If all students turned in completed assignments on time (100% completion), then the teacher would randomly pick a number from 1 to 18 from an opaque jar to determine whose paper would be checked *privately* to see if the second criterion (85% accuracy) was met. If the privately scored paper was 85% correct or better, then the entire class would be allowed to twirl a spinner to determine the type of reward. Spinners contained five pie-shaped wedges of differing widths, with higher preference rewards corresponding to *narrower* pie slices. The narrowest pie slice bore a question mark. On days when the spinner landed on the question mark, students were allowed to pick one of 15 mystery motivator envelopes hanging from the ceiling. Each decorated envelope contained slips of paper specifying the rewards (e.g., free time, dress-down days, and lunch in the room). Possible rewards were generated earlier by students through a suggestion box placed in the classroom. If the class or randomly selected pupils failed to meet either criterion, then they were encouraged to try harder the next day. The names of students whose papers were reviewed were never revealed.

The investigators used an A-B-A-B design and showed that the mystery motivator game produced immediate and noticeable improvements in pupils' homework completion and accuracy rates (Figure 1).

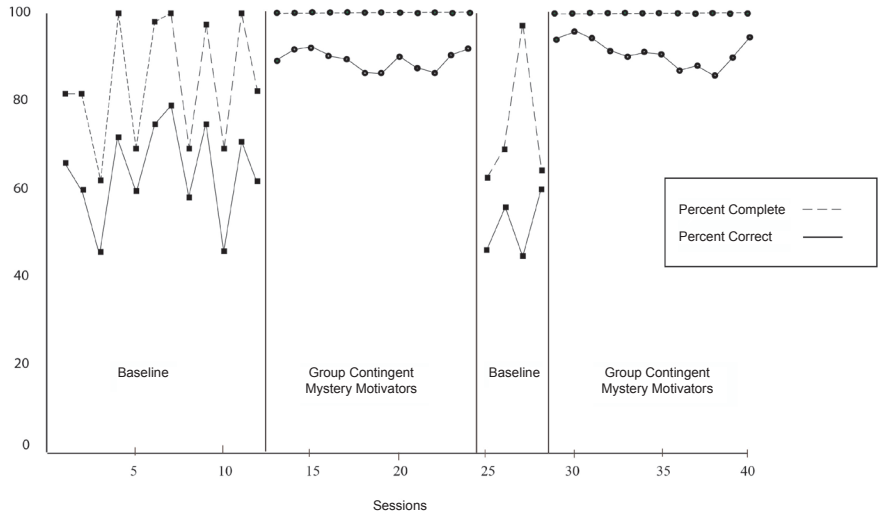

Figure 1. Mean completion and accuracy rates for fifth- and sixth-grade inclusion class across experimental phases.

During initial baseline, about 85% of the class turned in daily homework assignments (range = 42% to 100%). Homework accuracy, however, averaged only 64% (range = 46% to 79%). When the mystery motivator game was put into effect, both completion and accuracy rates improved immediately and noticeably. In fact, all students (100%) turned in *every* homework assignment during both intervention phases, and the class averages were 89% and 91% for each intervention phase. When the intervention was removed briefly, students reverted to inconsistent homework completion (M =75%), and their accuracy rates fell to an average of 52% (range = 45% to 65%). It is significant to note, as well, that there were no overlapping data points across any experimental phase.

During the past 3 years, over 40 research-to-practice studies were completed by general education teachers in their own and other classrooms. The number and types of studies are depicted in Table 6. These studies, using a variety of empirically supported practices in general education classes, produced consistent improvements in pupils' academic and/or behavioral performance. Most studies replicated findings from other researchers and showed that selected practices were also effective under typical teaching conditions. Novice teachers usually selected practices that could be used on a classwide basis and focused on increased student productivity and accuracy, active participation in class, and/or reducing common disruptive behaviors (e.g., talk-outs, out-of-seat, and noncompliance). Obviously, many studies were limited by short duration, lack of generalization and maintenance data, and occasionally fewer reliability and fidelity assessments. Their impact on pupil performance, however, was consistently positive, and the procedures and outcomes were well accepted by novice teachers and their public school colleagues.

SUMMARY AND IMPLICATIONS

The state of the art in comprehensive teacher induction is not pretty, at least not in terms of its documented impact on teacher practice and, more important, on student learning. This does not mean that comprehensive teacher induction cannot impact practice and learning. Rather, it suggests that a more concerted effort must be made to do so. Teacher practice and pupil learning can no longer remain a secondary variable of interest for practitioners and researchers. Indeed, impact on pupil learning should be viewed as the "gold standard" for determining if induction or any professional development programs are working (Greenwood & Maheady, 1997). Similarly, comprehensive induction programs must be reconceptualized as one component of a larger data-based culture dedicated to the improvement of all teaching practice. Much more thought and effort must also go into what is taught in professional development and how teachers, novice and veteran, can put newly acquired knowledge and skills into practice.

Table 6

Number of Research-to-Practice Studies Completed During Academic Years 2007–2010

	Intervention Strategies					
	CWPT	**Response cards**	**Self-monitoring**	**Group contingent mystery motivators**	**Numbered Heads Together**	**Other**
Early childhood		1				1
Childhood (Grades)						
K–2				2		1
3–6	6	2		6	1	1
Adolescence (Grades)						
7–12 Math	1	1	2			2
7–12 Science	3		2	1		
7-12 Social studies	1	1	2	2		2
Totals	**11**	**5**	**6**	**11**	**1**	**7**

In effect, a roadmap for building an evidence-based culture is needed (Detrich, et al., 2008). Finally, teacher educators and applied researchers must work collaboratively with P–12 schools to identify common educational problems and to develop effective, efficient, and socially acceptable strategies for preventing and/or ameliorating these instructional challenges. Given the increasing role of science in education, the rise of evidence-based federal policies, and the urgent need to improve educational outcomes in our country, there is no better time for such revolutionary changes to occur. Comprehensive teacher induction provides one vehicle for making such sweeping changes a reality.

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