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More Swimming, Less Sinking

Perspectives on Teacher Induction In the U.S. and Abroad

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Introduction: Making Teacher Induction More Effective

Historically, few states, districts, and schools nationwide have had formal or informal programs to support beginning teachers. But states and districts are now recognizing the wastefulness of leaving new teachers to sink or swim, because large numbers of teachers who embark on this career sink. Just last month, the annual "Quality Counts" report by *Education Week* reported that 23% of new teachers leave teaching within their first three years.[1] Further, the brightest novice teachers, as measured by their college entrance exams, are the most likely to leave. A major reason new teachers leave is dissatisfaction with the job (particularly mathematics and science teachers).[2,3] "Quality Counts" also reported that beginning teachers who did not participate in an induction program were twice as likely to leave teaching. This suggests that induction programs can help stem the exodus of new teachers.

Some good news is that about 30 states now require or provide funds for districts to offer induction experiences for new teachers.[4,5] Policy makers increasingly are addressing the issue due to the escalating pressure to retain new teachers and improve their teaching. This undoubtedly will lead to the launching of additional teacher induction programs. Indeed, eight states currently without any induction program plan to implement one within the next few years, and five states already having induction programs plan to expand them soon.[6] The importance of teacher induction is even being brought to the general public's attention, for example, by major newspapers such as the *Washington Post*.[7]

But as teacher induction policies proliferate, districts and universities are implementing induction programs without sufficient resources to meet the needs. Only 19 states mandate that districts offer programs to all beginning teachers, and of those, only 10 states foot some or all of the bill.[8] A few states put substantial resources behind their teacher induction policies. But with most states having underfunded or unfunded mandates, it is no surprise that the majority of new U.S. teachers still are without substantial assistance. Clearly, one goal for improving U.S. teacher induction is to reach every novice teacher.

The emphasis of this paper, however, is to sketch how U.S. teacher induction programs can be made more effective. We consider a program's effectiveness by asking the following questions.

- What are the goals of the induction program?
- Can the program's design and activities accomplish these goals?

New teachers have more types of needs than U.S. teacher induction programs typically address. Further, U.S. induction programs could take advantage of a wider range of activities for delivering assistance than they typically do. Using more substantial and varied activities requires leaders to design their programs more systematically, yet allowing for local flexibility.

The paper briefly explains these issues and uses examples of effective induction programs in the U.S. and from abroad to illustrate potential solutions to them. The U.S. is not alone in needing to increase and improve teacher induction. Among 15 of the countries that performed well in the Third International Mathematics and Science Study (TIMSS), most have no systems, or weak ones, for supporting beginning teachers.[9] However, through funding from the National Science Foundation, the authors and their colleagues found a few countries where some locales are supporting beginning teachers in innovative ways. Although we only are at the midpoint of our three-year study, we already are seeing some examples of induction that could be adapted to refine or supplement current U.S. induction programs. But attention must be given to the context of programs abroad when considering how to use them in the U.S. Some practices may not be appropriate in the U.S., but they challenge us to think about what we tend to ignore or leave unexamined in the U.S., to think "outside the box."

Broadening the Goals of Induction

Every induction program could be deemed effective in the following sense: New teachers face such overwhelming challenges that almost any assistance is helpful. Even without an induction program, schools usually provide orientation for new faculty, such as introducing them to school and district personnel, resources, and procedures. And virtually every explicit induction program addresses to some extent the personal support of new teachers, such as handling stress and maintaining appropriate relationships with students. Most induction programs go on to increase novice's skill with general teaching abilities they learned in teacher preparation, such as handling discipline problems and using effective questioning techniques. All of these are critical, necessary types of support.

But more effective induction efforts go beyond this kind of supportive role.[10] They are not limited to responding to teachers' day-to-day crises and providing general teaching tips. They go beyond merely being a safety net for teachers to helping them learn the following:

- subject-specific issues in curriculum and instructional practices; and
- basic professional skills, such as learning how to communicate effectively with parents or evaluating students' learning and writing informative reports on their progress.

Not surprisingly, induction programs that address a broader range of new teachers' needs require more time. So, more effective teacher induction programs are likely to work with new teachers for more than just their first year. For example, Shanghai educators regard new teachers as those in their first three to five years. While much of the official induction program emphasizes the first year, administrators and faculty continue to help teachers develop in subsequent years. They do not regard the outcome of induction to be a great teacher; they see induction as guaranteeing basic competence and accelerating the timetable for moving novices toward becoming master teachers.

Effective programs regard induction as a distinct but not isolated phase in a teacher's life, taking account of what novices learned in their teacher preparation and equipping and orienting them for professional development over their entire career.[11] In short, induction should be designed as part of the continuum of a teacher's life, from preservice through continuous inservice learning.

Including a Subject-Specific Focus

Few U.S. induction programs include a subject-specific focus, for example, deepening new teachers' understanding of how to teach mathematics and science. (While teachers need to command general teaching skills, they also need specific knowledge of how to help students learn different subjects.) This could be a particularly serious gap for several groups of new teachers: those assigned to teach mathematics and science when their preparation is in other subjects (teaching out of field); middle school teachers whose preparation was in a program for elementary school teaching; and those who enter the profession through alternative certification routes, who may deeply understand mathematics or science but have little specific knowledge of how to teach it.

Even new teachers with strong content knowledge in their assigned teaching subject and who graduated from traditional preparation programs need assistance. Teacher preparation courses often provide only limited understanding about teaching specific subjects, and prospective teachers are not able to grapple with many complex aspects of mathematics and science instruction during their limited practice teaching. At a minimum, new teachers generally need assistance to implement high quality instructional goals and use instructional materials appropriately in the face of many school faculty that are neutral or resistant toward them. For example, researchers at ten preparation programs for mathematics and science teachers recently followed the progress of their graduates for three years and reported the following: "Observations of teaching practices [of beginning teachers] contrasted starkly with teacher beliefs. While teachers professed student-centered beliefs, they behaved in teacher-centered ways."[12]

Some U.S. teacher induction programs do contain a subject-specific component, for example, Connecticut's program (see Appendix A).[13] California's extensive program is slated to add a subject-specific component with a roll-out for various subjects over the next three school years. The Exploratorium science center in San Francisco has a substantial induction program that augments California's induction program in part by including a central emphasis on science content, curriculum and instructional practices while still addressing general induction needs.[14]

Scheduling and balancing a program's attention to general versus subject-specific needs require thoughtful attention and monitoring. The Exploratorium program is finding that it is imperative to regard new teachers' general instructional issues as legitimate concerns that must be addressed up front. If you help novices deal with the very real distractions of discipline problems and the like, the overwhelmed new teachers cannot pay attention to deepening their understanding of teaching their subject. Once the new teachers are freed from these fundamental teaching concerns, they are more receptive to and better able to absorb subject-specific assistance at the end of the first induction year and throughout the second year of the program.[15]

In Shanghai and Japan, new teachers periodically are asked to teach a best possible lesson while being observed by many experienced teachers.[16] New teachers are expected to spend considerable time becoming familiar with what mathematics is appropriate for children at different stages of

development and what instructional techniques are most effective for helping children in a particular grade to understand and use the relevant mathematics. The observed lesson is an opportunity for the new teachers to show the extent of their learning about teaching their subject. They put serious thought and effort into their preparation of this lesson and get considerable help from mentors, departmental colleagues, or specialists from the district.

During a long debriefing session, their many colleagues collectively but supportively critique the novice's instructional practices and classroom management. But, especially, they discuss in detail how best to help children learn the mathematics and science concepts in that lesson. As briefly described by Suzanne Wilson during the November Commission meeting, teachers discuss "important and difficult points." They explore key mathematics concepts and how a lack of earlier mathematics concepts or children's nave ideas can be barriers to learning them. It is rare for a U.S. teacher to be observed by another teacher (let alone a whole school department) and subsequently to discuss ways of improving instruction in a subject. Instead, most U.S. teacher observation deals with general instructional techniques such as maintaining discipline or using good questioning techniques.

Developing Basic Professional Skills

Some aspects of teaching definitely are best learned on the job during the induction period rather than in teacher preparation. More effective programs identify these professional basic skills and proactively help new teachers to learn how to carry them out effectively. But U.S. induction programs generally deal with these skills only as problems arise.

In New Zealand, Shanghai, and Switzerland, it is striking to see how induction programs give concentrated attention to such basic skills of teaching as how to do the following:

- daily and long-term planning of a lesson's content, teaching strategies, and logistics,
- assessing students' work, including creation and scoring of teacher-made tests,
- writing informative reports to parents about their children's progress, and
- communicating more generally with parents.

For example, these skills become part of the content of school-based orientations and district-based workshops in Shanghai. Preservice teacher education is hard-pressed to provide authentic opportunities to learn such routine tasks, but teachers need competence in these areas almost as soon as they begin their work. To wait for these issues to be addressed in some inservice training or to leave it to chance that teachers will develop the necessary skills through trial and error is, from the perspective of Shanghai's educators, unrealistic and irresponsible.

Balancing Assistance versus Assessment

An important issue in designing teacher support is whether the purpose is solely to assist or also includes assessing new teachers. There are U.S. examples of programs of each type that are generally well-regarded by experts and participants (e.g., see Appendix I.)

These seemingly conflicting purposes can be accomplished in the same program. In New Zealand, for example, department heads typically serve as mentors of new teachers but also are the formal

appraisers of their performance. Yet, a new mathematics teacher whom we interviewed had asked her department head (her mentor) during the first months of school to observe her most problematic class of mathematics students. When researchers asked whether she felt threatened about letting the department head see this situation, she protested: "Goodness! They are here to help, after all. If you don't let them see what you are dealing with, how in the world will it make a difference where I need it most?" In Switzerland, however, the induction programs emphasize separation of teacher assessment and assistance. These roles are now assigned to different, specially trained personnel, whereas they originally had been vested in the same people. Induction programs need to consider how assessment functions can best be handled to prevent a damping effect on new teachers' willingness to disclose the very problems for which they most need assistance.

Using a Greater Variety of Induction Activities

In this section, we briefly discuss initial teaching assignments. There are some U.S. school practices that do actual harm to beginning teachers and their students rather than support them. The rest of this section describes a wider range of induction activities that could be used in U.S. programs, where one-on-one mentoring is the most dominant or sole strategy.

Improving Initial Teaching Assignments

The typical extent to which a U.S. induction program would attend to new teachers' assignments would be to arrange circumstances that permit new teachers and their induction providers to participate in induction programs. Typically, some common periods of non-instructional time for novices and their mentors are scheduled so that they can work together. Determining a teacher's specific assignment (courses to teach, students assigned, non-instructional duties, etc.) within the entire school's needs is very complex and must be done at the school level. While states and districts could not stipulate specific requirements for new teacher assignments, they could provide guidelines on what is appropriate.

But schools must tackle some beliefs about school staffing that run counter to supporting new teachers. Common practice is to assign experienced teachers (those who have "earned" it due to seniority) the best courses and students. As a consequence, new teachers may receive the most difficult courses and students. Further, new teachers may be disproportionately urged to take on such non-instructional duties as monitoring halls and lunch rooms, or sponsoring clubs and sports after school. Indeed, it is common practice for administrators during interviews to all but require new teachers to take on these extra-curricular responsibilities as an off-the-record condition of hire. Burdening new teachers with the most demanding teaching assignments in the school and non-curricular responsibilities is often self-perpetuating. Veteran faculty regard this as a rite of passage-they went through it at the beginning, so new teachers should bear these hardships as well.

There certainly are U.S. schools that behave differently, basing new teachers' assignments on their nascent skills and needs for development as well as the needs of their students. And in our international study, we are finding some locales or countries where the prevailing mindset is to put a premium on the needs of new teachers. In these locales, programs arrange new teacher assignments to ensure the most appropriate teaching assignments that are possible within the

particular school's circumstances. Perhaps the strongest examples of such beliefs and practices are found in New Zealand.

- The national government for over 25 years has provided supplemental salary funds to every school with a new teacher. These funds are earmarked for the new teacher's support. Schools almost universally decide to provide new teachers with a full-time salary but only an 80% teaching load in their first year. Further, the national ministry requires schools to develop a professional development program for the induction of the new teachers, tailored to the school's local circumstances and the individual new teacher's needs.
- Beginning teacher coordinators, designated by schools having more than one new teacher, view it as their responsibility to counsel novices on striking an appropriate balance among successfully teaching, volunteering for extra-curricular responsibilities, and maintaining psychological well-being and a personal life. While all teachers should be involved in the school's extracurricular activities, new teachers must not forget that their first responsibility is to learn how to provide good instruction. This means saying no to other duties, if necessary.

Using a Wider Range of Activities

One-on-one mentoring is the most prevalent U.S. strategy for supporting new teachers. We are observing some enhanced mentoring practices abroad. We also are observing a greater range of induction practices. These include, in addition to improving initial teaching assignments and conditions: (1) organizing facilitated peer support, (2) using more varieties of teaching observation, (3) providing science laboratory technicians, and (4) several smaller support mechanisms. Enhanced mentoring practices. Effective mentoring practices include:

- selecting mentors who meet the individual's needs,
- solid training of mentors, and
- using multiple mentors for support.

Regarding the last suggestion, multiple providers could assist with induction if their activities were coordinated. Also, a general culture of support for new teachers can play a strong informal role in their induction. This is a strong aspect of induction in some Asian countries.[17,18] This feature is surfacing in our current studies in China, Japan, New Zealand, and Switzerland. As for training, too many mentors in the U.S. receive no or little training.

But the means of selecting mentors is as important or more so than the training they receive. It is not uncommon in the U.S. for mentors to be assigned in name only in order to fulfill a policy requirement and for them to interact rarely with new teachers. Where mentors receive supplemental pay, administrators need to avoid viewing mentor slots as a perk to be awarded to teachers based on seniority rather than their ability to mentor. But even in the many places where mentors are thoughtfully selected and their efforts are substantial, the pool of teachers considered for mentor roles is restricted to other teachers in the school.

What if the overall quality of a school's faculty is weak or mediocre? In the case of middle or secondary schools, what if the new science teacher is the only science teacher there? In Japan

and Shanghai, school districts go to great lengths to diagnose this kind of problem and to solve it, even to the extent of relocating a teacher from one school for a year to be the mentor for a new teacher at another school, or providing release days for them to visit the other school. Using the Internet for networking mentors and novices also can help solve these problems. With support from the National Science Foundation, the Montana Early Career Support Program uses telecommunications to link novice mathematics and science teachers in Montana's many small rural schools with appropriate mentors.[19] The National Science Teachers Association is developing an Internet-based network for linking volunteer science teachers to novices who request support, beginning with elementary school teachers who seek help with science instruction.

Facilitated peer support. It is important to provide mentors, but new teachers get other kinds of benefits from speaking with each other. Among U.S. programs, creating occasions for new teachers to meet is a rare but not unknown strategy.[20] The biggest benefit is simple, but profound. Time and again, the new teachers we interview who have participated in peer support groups say it was absolutely crucial for them to learn that "It's not just me." In other words, most new teachers feel overwhelmed and inadequate. Learning that almost every new teacher shares this experience helps them realize that their teaching difficulties are not necessarily an indictment of their abilities or preparation.

The most intensive use of this induction strategy is in Lucerne and Zurich, Switzerland, where states orchestrate the establishment of "practice groups." Groups of 5–6 new teachers from different schools are formed and meet biweekly. Participants found that meeting with peers from other schools made them free to be more candid about difficulties at their own school. Experienced and highly competent teachers who are specially trained for this role are assigned as facilitators for each group. Meetings alternate among participants' schools. Typically these sessions deal in depth with the basic professional skills, such as how to communicate with parents. The new teachers decide upon their meeting topics, although facilitators also make sure that vital topics are covered. While the new teachers find it burdensome to regularly travel across town to meet, many describe this induction activity as invaluable and worth the effort.

New Zealand schools employ a variant of this strategy. Each school appoints an "Advice and Guidance" coordinator who convenes first- and second-year teachers biweekly on site (although often less frequently for the second year teachers).

More varieties of teaching observation. Typically, experienced teachers observe new teachers. But, in the countries we are studying, it is more common than in the U.S. to have new teachers observe other teachers, among these categories: (1) other new teachers, (2) mentors, (3) teachers in the same subject or grade, and (4) teachers of other subjects or grades.

Different kinds of benefits arise from each type of observation. Observing peers can be part of the peer support process, although it is important to avoid creating situations where the "blind are leading the blind." Observing your mentor's practice can illustrate the advice they are offering. Observing other teachers in the same subject or grade helps increase your knowledge of how to teach similar material and diversify the teaching practices and styles you could consider developing. In some countries, whenever a beginning teacher is alone in their subject area in their school, efforts sometimes are made to send that teacher to a different school to observe a teacher with

similar classes. Also, observing teachers in other subjects helps you focus on classroom management and similar issues without being distracted by the subject of the lesson.

Science laboratory technicians. In New Zealand (also England and Australia), secondary school science departments have laboratory technicians who prepare solutions and equipment, repair apparatus, order supplies, and more. This feature of the education system is not part of the induction program. But the presence of technicians enables new teachers, particularly, as well as experienced teachers to teach hands-on science virtually every day, a chronically unfulfilled goal of U.S. science education.

Some smaller induction activities. Programs abroad also use smaller induction activities, such as those listed below. Undoubtedly, these induction activities can also be found among U.S. programs.

- creating a required reading list,
- establishing an 18-hour district hot-line for new teachers,
- getting new teachers involved in their subjects' professional associations,
- sending them to professional conferences along with experienced teachers,
- writing new-teacher handbooks,
- gaining advice by using Internet networks,
- conducting action-research on their own development, and
- providing access to confidential counseling.

Making the Designs and Implementation of Programs More Effective

Using a greater range of induction activities and involving more types of induction providers require well-designed specification of different roles and systematic means for coordinating the multiple activities. And the implementation of induction programs could be improved if evaluation of the programs' functioning and outcomes were built-in.

Systematic Yet Flexible Sets of Activities

Both the Japan and Shanghai induction systems illustrate how different levels of policy actors and induction providers can work in coordinated fashion to support new teachers. Japan's teacher induction has well-articulated roles for different levels of the system. For example, the national ministry operates a cruise ship which over the course of a year takes 20% of the country's beginning teachers on a retreat. Day-to-day support is provided by local schools, while weekly and monthly activities are run by school districts.

Shanghai's system simultaneously relies on at least three levels-the municipal education bureau (for all of Shanghai), districts (of Shanghai) and individual schools. Each level has a unique function, yet there is tight alignment among the different activities. Schools provide intensive mentoring for new teachers, while districts offer a planned curriculum of workshops and study groups over the new teachers' first year that broaden the range of opportunities these teachers have. This results in providing teachers all the benefits of close support and assistance by mentor teachers who are most familiar with the new teacher's school, subject area, and students.

District involvement allows teachers to view an expanded range of excellent teaching, to connect with other novices in ways that encourage reflection and exchange, to identify resources beyond their own school, and to learn knowledge and skills that complement what any one mentor teacher can provide. The district involvement avoids dependence on the luck of the draw that so often happens in induction that involves only mentoring. The district participation also allows the scope of learning to be broadened without unduly raising demands on schools, some of which are already hard pressed to do their work.

The municipal level sets policy requirements and licensing standards for the induction of new teachers, yet it delegates much discretionary authority to the district to determine how best to support new teachers in its community. By having the municipal education bureau involved, induction in Shanghai has become system-wide, not something only available to districts with sufficient resources or visionary leaders committed to such work. Having leadership from the top means that districts have to take induction seriously.

Well-articulated programs must also plan on variation that is at the heart of schooling. Shanghai's approach builds this into the policy system. For example, the municipal level policy states that all new teachers should have both school-based mentoring and district-level induction training. This policy requires districts to offer 100 hours of induction-focused support to all new teachers, but the districts are to determine the content and form of such support. In places there is a relatively small number of veteran teachers in the area or where the teaching is considered only mediocre or even weak, districts compensate in innovative ways. One district's solution has been to create district subject matter experts who are available to help new teachers through a weekly telephone hot line. Another district assigns each new teacher its own district mentor, as well as the school mentor he or she is working with. Some districts have created an extensive curriculum of district workshops that work across and within subject areas and grade level, while another district-a stable, high-achieving district with few new teachers-locates most of its induction program in existing curriculum development and teaching research efforts.

By contrast, most induction in the U.S. is delivered by personnel at the school and, occasionally, district levels. Half of the school district programs in the Recruiting New Teachers study involved no partners whatsoever.[21] The most common outside partner was teacher preparation faculty. However, it is challenging for U.S. teacher preparation institutions to follow up with their graduates in order to assist in their induction. For example, many preparation programs currently do not even keep records of where their students gain employment, let alone interact with them. However, there are examples of U.S. institutions working effectively with their graduates.[22,23] The American Council on Education (a leading organization for higher education) recently urged university and college presidents to "ensure that graduates of their teacher preparation programs are supported, monitored, and mentored." [24]

In some other countries, teacher preparation institutions are partners in induction programs. For example, in Taiwan, the government recently mandated that all teacher preparation institutions provide technical assistance and professional development to their graduates, and faculty are developing ways of doing so, often based on using technology to help overcome the problem that most graduates go on to teaching positions scattered throughout the island. In Zurich, Switzerland, the institution for elementary teacher preparation brings all its graduates who are working

in Zurich back for a three-week institute at the end of their second year of teaching. The teachers themselves have a hand in designing this institute, which is considered the culminating activity in their induction period.

Evaluating Program Effectiveness

How can programs determine whether they are successful in meeting their goals? It is difficult to link teacher induction activities to changes in student achievement, but some linkage may be possible. More direct relationships can be explored between teacher induction and changes in teachers' beliefs and practices. But many induction programs do not put significant effort into evaluation of their outcomes. The Exploratorium's program for beginning science teachers is planning a substantial study of the effects of induction activities on teachers' content knowledge and instructional practices, as well as student achievement, evidenced by juried inspection of samples of student work. This research also will follow cohorts to provide direct longitudinal data on the retention of beginning teachers. Substantial evaluation components need to be more prevalent among U.S. induction efforts.

There also needs to be more research on U.S. teacher induction issues, as illustrated by Fideler and Haselkorn's remarks in their recent study of teacher induction in urban districts:

Not enough is known about the degree to which induction is integrated into the teacher development continuum and how it is funded; the nature and scope of what schools and districts/systems actually implement [emphasis added] as an induction process; and whether or how well support providers are trained, how well their roles are defined, and the conditions under which they attempt to carry out their duties.[25]

Providing Sufficient Resources

Effective teacher induction will cost more than U.S. programs generally have allocated. First, few of even the limited programs now in place reach every beginning teacher. But, additional resources also will be needed to include the program improvements discussed in this paper. It is beyond our scope here to provide even ballpark cost estimates, but such fiscal analysis must be done to avoid failure by broadening policies for teacher induction without fully considering the cost of implementing them effectively.

Recommendations

(*Note:* The authors advance these recommendations for improving U.S. teacher induction while fully recognizing that the Commission must decide whether to discuss teacher induction in its report and what recommendations it advocates for improving it.)

1. Broaden the goals of U.S. teacher induction.

More effective induction efforts go beyond responding to teachers' day-to-day crises and providing general teaching tips. They also help new teachers learn the following:

- subject-specific issues in curriculum and instructional practices, and

- basic professional skills, such as learning how to assess student work or communicate effectively with parents.

2. Use a greater range of induction activities.

Deepen the predominant U.S. induction practice of one-on-mentoring:

- by carefully selecting and thoroughly training the mentors, and
- making use of school-wide support of beginning teachers.

Use sets of induction activities by adding ones that are rare in the U.S. but common in countries placing an emphasis on teacher induction:

- improved initial teaching assignments and conditions,
- facilitated peer support groups, and
- more varied observation of teaching.

3. Implement induction activities more effectively.

Broader teaching induction programs that use more varied induction activities and providers are most effective when:

- Programs include evaluation of their outcomes;
- Induction activities are systematically coordinated, and involve complementary participation by schools, districts and states;
- Programs involve preservice institutions and professional associations;
- Policies and programs are flexible enough to address the needs of individual schools and teachers; and
- Sufficient resources are provided.

Appendix 1: State Examples of Induction Programs-California and Connecticut

The induction programs in California and Connecticut are two of the most well-regarded for incorporating many of the features of "effective" programs discussed in this paper such as taking more than one year, dealing carefully with assessment and assistance in the same program, and including a subject-specific component. Like most U.S. programs, however, they might benefit from broadening the program focus, diversifying the induction activities employed, and investing all the resources needed to help every new teacher address the entire range of needs faced by novices.

California. Extensive programs are in place to support beginning teachers in California. The state currently allocates $80 million[26] to the state mentor teacher program, and $72 million[27] to its voluntary induction program-Beginning Teacher Support and Assessment (BTSA). As of 1996, 5% of new teachers participated in BTSA, and plans are underway to expand the program to all beginning teachers in the state.[28] Key elements of the BTSA program include support (from a mentor) and individualized formative assessment (assessment for the purpose of improving practice, not for formal teacher evaluation). Whenever possible, support and assessment are provided by the same

person. BTSA is adding a subject-specific component with a roll-out for various subjects over the next three school years.

During a two-year induction period each BTSA teacher and the support provider/assessor develops, and regularly revises, an Individualized Induction Plan (IIP) based on the novice teacher's emerging needs. An IIP includes a beginning teacher's growth goals, specific strategies for achieving those goals, and documentation of progress in meeting those goals. In addition, first- and second-year teachers participate in intensive learning activities that build on their pre-service preparation and lead to lifelong learning.

While each BTSA program has distinct characteristics that reflect local circumstances, state standards[29] provide criteria for designing, implementing, and evaluating induction programs; for instance:

- Support providers/assessors and beginning teachers should be given dedicated time (e.g., release time; reduced teaching load) to work together;
- Beginning teachers who are placed in challenging settings should receive increased support (e.g., intensive mentoring; specialized training); and
- $5,000 should be allocated for each beginning teacher-$3,000 from state resources and $2,000 from local sources.

Connecticut. New teachers must successfully complete the state induction program—Beginning Educator Support and Training (BEST)—within 3 years of beginning their first teaching assignment. As outlined in Table 1[30] , BEST is a comprehensive program that provides novice teachers with support and opportunities for learning (emphasized the first year), and assessment of their teaching (emphasized the second year).

TABLE 1. KEY FEATURES OF CONNECTICUT'S INDUCTION PROGRAM

YEAR ONE	YEAR TWO
School Support by mentor or support team **State Support** discipline-specific seminars; state teacher assessment instrument clinics **Assessment Activity** only for science teachers, science safety assessment	**School Support (Optional)** by mentor or support team **State Support** discipline-specific seminars; portfolio clinics **Assessment Activity** submission of a teaching portfolio by May 1

BEST is the central component of the Connecticut teacher improvement initiatives that began in 1986, which rest on tight coupling of the state teaching standards, teacher assessment, induction, and licensure. In addition to impacting beginning teachers, nearly 40% of the state's experienced teachers have been trained in effective teaching practices in order to serve as mentors and assessors of beginning teachers. The majority of Connecticut's $3.4 million budget for BEST is used for the state-run mentor teacher workshops. Also, each district receives about $200 per new teacher from the state to pay for mentor teachers' stipends.

Appendix 2: Summary of Induction Programs in Selected Countries

(Note: The National Center for Improving Science Education at WestEd (NCISE) and Michigan State University (MSU) are studying induction of mathematics and science teachers at the middle grades. At NCISE, Ted Britton and Senta Raizen (study co-directors) and Mary Ann Huntley are investigating best practices in New Zealand and Switzerland. MSU researchers Lynn Paine (study co-director), David Pimm, Suzanne Wilson, and Dan Chazan are studying teacher induction in France and Shanghai, China. The paper does not discuss teacher induction in France because data collection for France is just beginning. Information about Japan is drawn in part from a separate NSF-funded study by Michael Padilla, Joe Riley, and colleagues at the University of Georgia. Current studies in Japan and New Zealand also build upon research led in the mid-1990s by Jay Moskowitz at the American Institutes for Research.)

Table 2 summarizes the induction features that are discussed in the paper and found in the selected countries we are visiting in our NSF-funded study. Compared to common practice in the U.S., teacher induction in the other countries has a broader focus, improves teachers' initial assignments, uses a greater variety of induction activities, and systematically coordinates induction with multiple providers.

Context is an important caveat when considering whether and how induction programs from abroad could be useful in the U.S. Some practices from abroad may not be appropriate in the U.S., but they challenge us to think "outside the box," specifically, about what we tend to ignore or leave unexamined in the U.S.

For example, it is important to know something about teacher preparation in each country in order to understand the nature or extent of the new teacher induction programs, so we also are studying teacher preparation in our project. We are finding some interesting contrasts between the U.S. and the selected countries in the preparation of mathematics and science teachers, but discussion of these findings was outside the scope of this paper.

To illustrate, prospective teachers in Japan and China only have two weeks of practice teaching in their preparation programs, which creates the need for induction programs that provide practical advice on teaching, including attention to knowledge of how to teach specific subjects. (By contrast, U.S. students participate in at least 12 weeks of practice teaching.) Experts in Japan have made unofficial remarks that the extensive induction program was mandated by the National Ministry because reforms in teacher preparation were needed, but little chance of success was envisioned for changing the country's teacher preparation programs. So, induction programs were added to complement teacher preparation.

Particularly in France, Japan and Switzerland, graduates from teacher preparation have stronger mathematics or science content preparation than U.S. graduates. In Switzerland, prospective secondary teachers take a masters-degree equivalent in mathematics or science during their preparation. Therefore, induction programs in these countries put no emphasis on deepening new teachers' content knowledge.

TABLE 2. INDUCTION POLICIES, PROGRAMS, AND PRACTICES IN SELECTED COUNTRIES

FEATURES OF INDUCTION	JAPAN	NEW ZEALAND	SHANGHAI	SWITZERLAND
Broader Focus				
induction more than one year		✓	✓	✓
includes subject-specific focus	✓		✓	
includes focus on basic professional skills	✓	✓	✓	✓
Improved Initial Teaching Assignments				
release time provided	✓	E	✓	
assign less challenging courses/students	✓	✓	✓	
Greater Variety of Activities				
entire department observes/critiques lessons	✓		✓	
use multiple mentors at school	✓	✓	✓	
substantial mentor training				E
use mentors from other schools if necessary	✓		✓	
facilitated support, groups from different schools	✓	✓	✓	E
facilitated support, groups within schools		E		
varied types of teaching observation	✓	✓	✓	✓
provide science laboratory technicians		E		
Systematic Coordination, Multiple Providers				
school districts provide workshops/courses	E	✓	E	✓
systematic coordination of different providers	✓	✓	✓	✓
involve teacher preparation institutions				E

Summary of induction features used in other countries. Features may be used in specific locales within countries rather than nationally; e.g., study in China is limited to the greater metropolitan area of Shanghai, and study in Switzerland is investigating school districts of Bern, Lucerne, and Zurich. Letter E indicates feature is extensively used in the country.

Endnotes

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