

Building Capacity for Teaching and Learning in Florida

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Introduction

Florida's focus on accountability as a lever for increased educational productivity has a long history (Herrington, 2005; Herrington & MacDonald, 2001). During the 1990s, Florida, like most other states and many school districts, embraced standards-based educational reform as a primary accountability mechanism. Beginning with Blueprint 2000 in the early part of the decade and continuing through the development of the Sunshine State Standards, the Florida Comprehensive Assessment Test, and the Florida school grading system, the state educational accountability system has been premised on setting an increasingly higher bar and holding students and schools to defined levels of achievement. The elements of this system include explicitly stated standards that define the curriculum, assessment systems to measure outcomes, public reporting of results, and a system of positive and negative incentives (see Herrington & MacDonald). To date these efforts have largely lacked one key element: capacity-building.

Standards-based reform challenges many of the assumptions of traditional American education. In a standards-based educational system, decisions about curriculum and instruction are public, not private, matters, decided at the district, state, or even national level, not by individual classroom teachers (Elmore, 2000). The status of the teacher is elevated in that standards-based reforms share an assumption that what happens in schools determines to some large degree what students learn and their level of achievement. At the same time, teachers lose discretion about what to teach, their practice is open to scrutiny, and they are held accountable for children learning.

Teaching is more challenging in strong standards-based systems, and learning in the strongest standards-based reforms extends well beyond basic skills to include critical thinking, information seeking, problem-solving, and applications of technology. Standards-based reform became the model for advancing educational achievement at the same time that the students served in America's public schools were becoming more culturally, racially, and economically diverse. High levels of academic achievement for all children is now an explicit goal of public education. All of this has combined to make teachers' work more difficult.

In the press to increase accountability and implement standards-based education reform, policy makers in Florida and nationally have paid more attention to the content of the standards, the development of assessments, and the system of sanctions and rewards than to whether educators and students, those most directly affected by the reforms, have the capacity to meet the standards. However, responsibility for building capacity to support reform efforts is the reciprocal of demands for accountability (Elmore, 2000, 2002). Effective change always requires both pressure and support, but, as Hargreaves and Fullan argued, "most governments have exerted far too much pressure...and provided not nearly enough long-term capacity-building and support" (1998, pp. 72-73).

Florida policy makers are not alone in their failure to pair accountability with capacity-building. Without capacity, however, the movement to standards-based educational systems will fail. Unless accompanied by capacity-building, accountability systems are inclined to be punitive and are likely to have substantial unintended negative effects: interest in teaching drops and qualified teachers leave the system, morale plummets among those who remain, curriculum narrows, and schools and classrooms become joyless places focused on test preparation and test taking.

In this policy brief we focus on building capacity to support standards-based reform. We define capacity as the ability to help students, all students, learn and achieve at high levels. We argue that capacity is a function of three elements: a) what teachers know, believe, and are able to do; b) school structures that support the teaching and learning process; and c) the ability of the community, broadly defined, to support the work of schools. In addition, we identify policy interventions that are likely to build capacity and enhance the learning process for all students.

Capacity for Teaching

Research and policy have increasingly acknowledged the key role that the quality of teaching plays in the academic achievement of children (Haycock, 1998; Ingersoll, 1999; *No Child Left Behind*, 2002; Sanders, 1998). When the standards are challenging, as they are in Florida, standards-based reform calls for a level and quality of teaching different from traditional teaching practice. Rather than teaching as telling, teaching in a standards-based system means the engagement of learners in active, problem-based learning. Because the standards apply to all children, effective standards-based teaching also means facilitating and supporting the learning of all children, including those who enter school ill-prepared to learn, those whose primary language is not English, and those who are at-risk because of mental and physical disabilities. Rather than teaching that covers broad content shallowly, standards-based reform generally calls for deeper knowledge of the content, for skill in the specific pedagogy relevant to a content area, and for thoughtful reflection on the teaching process (Stigler & Hiebert, 1999).

Teaching of this sort is not self-evident, cannot be modeled on the teaching one has experienced in traditional classrooms, and can only be obtained by changing the ways teachers think about and interpret what happens in classrooms (Kennedy, 1999). Creating and sustaining the conditions for this kind of teaching require strong recruitment mechanisms, robust preparation and induction programs that ensure that beginning teachers will find success and satisfaction in their early years of experience, and ongoing professional development that assumes teachers must first and always be learners.

Teacher Recruitment and Retention

Nationally more teacher candidates are prepared each year by colleges and universities than are hired or needed. At the same time, shortages exist in many states, in rural and urban areas, and in specific subject areas. Florida is one of several debtor states. The 30 colleges and universities with state-approved programs to prepare teachers graduate approximately 6,000 annually, while school districts hired between 13,000 and 15,000 teachers annually prior to passage of the class size reduction amendment in 2002. Straining the system even further, the class size requirements of the amendment will increase the demands for teachers by 31,800 teachers over the eight-year implementation period, or approximately 4,000 additional teachers per year (Council for Education Policy, Research and Improvement [CEPRI], 2003). The teaching force in Florida is predominantly white (76%) and female (78%) (Miller, 2002), while the student minority population increased from 32% to 47% during the past two decades. Who will teach Florida's children is an important policy question.

Teacher vacancies in Florida schools result from growth in the student population, involuntary and voluntary terminations prior to retirement age, implementation of the class size reduction amendment, and retirements. On average, about 9% of the teacher workforce turns over annually. Results of interviews with teachers who exited in the 2000-2001 school year showed most teacher vacancies occurred because of voluntary teacher terminations (CEPRI, 2002). The average years of service for exiting teachers was 9.3, indicating that reasons other than retirement are driving teacher vacancies. National data indicate that turnover, not retirement or growth, is responsible for two-thirds to three-fourths of the demand for teachers (Darling-Hammond, Berry, Haselkorn, & Gideler, 1999; Ingersoll, 2002). As a result, retention of teachers, rather than recruitment, has become a key policy focus.

Salary is an important retention issue. Florida teacher salaries are not competitive. Florida's average public school teacher salary in 2000-2001 was \$38,230, placing Florida 29th among the states and \$5,000 below the national average. Beginning salaries in 2001-2002 for teachers who hold a bachelor's degree ranged from a high of \$32,425 in Dade County to a low of \$22,000 in Union County, with a statewide average of \$26,592 (Florida Department of Education, 2002). By comparison, Florida's neighboring states of Georgia and Alabama set a statewide minimum salary level, and both offer much more attractive beginning salaries than many Florida school districts. Other data show that teachers' salaries do not compare favorably with salaries in many other occupations requiring a baccalaureate degree (CEPRI, 2003; Darling-Hammond, et al., 1999).

One way to offset low salaries is to support the costs of entry into the profession. However, individuals bear much of the cost of teacher preparation in the United States. Florida offers limited scholarship and financial assistance programs to candidates seeking

to enter teaching, and funds for several of the scholarship programs were cut in recent legislative sessions (CEPRI, 2003).

Both raising salaries and increasing financial assistance programs have substantial costs and will be difficult to fund at the same time that the additional costs of class size reduction must be covered by the state. However, these costs must be balanced against the costs of recruiting and inducting replacements and the costs of missed opportunities to learn.

Preparation for Teaching and Early Experience

What a teaching license means and what it takes to obtain one vary considerably from state to state. Both also vary considerably within the State of Florida. Traditional and alternative routes to teaching require different preparation and provide for different levels of quality control.

While closely regulating traditional teacher preparation programs in public and private colleges and universities, Florida has continued to maintain and expand alternative routes into teaching. By statute and rule, the state specifies the requirements for state-approved teacher preparation programs, including the content of general education, the course work for content specialization, and the nature of professional education. Approved programs are required to prepare candidates to teach literacy, higher order mathematics, and critical thinking. Approved programs include clinical experiences, including an extended teaching internship under the direction of a qualified teacher. Approved programs are lengthy and specific, so much so that baccalaureate-seeking candidates can rarely enter after the freshman year.

By contrast, candidates with a bachelor's degree from a regionally accredited or approved institution in an appropriate subject area can obtain a three-year nonrenewable provisional teaching certificate by obtaining employment with a Florida public school or selected nonpublic schools and demonstrating through performance on a written examination that they meet the subject area requirements. Candidates then have three years to demonstrate that they meet the requirements in professional knowledge, either through course work in specified areas or by completing an approved alternative program.

All routes to professional teacher certification require passing state examinations in general, content, and professional knowledge. However, the current procedures for obtaining teacher certification appear to restrict access to traditional teacher education programs while, at the same time, increasing access through alternative routes.

A fundamental difference between traditional and alternative routes is that those with provisional teaching certification learn to teach while they are fully employed as teachers, earning the same salaries and assuming the same responsibilities as fully licensed

teachers. Because the daily demands of teaching make it difficult to learn on the job, teachers licensed through alternative routes are likely to teach as they were taught, thus dooming reform proposals that require changes in teaching practice (Kennedy, 1999). Alternatively certified candidates are less likely to have the knowledge and skills to teach students with disabilities, students whose primary language is not English, and students who do not learn well from lecture- and print-based teaching methodologies. Moreover, these alternatively prepared teachers are often placed in the most demanding teaching situations with children who require the most skilled instructors (Ingersoll 1999; Lankford, Loeb, & Wyckoff, 2002). As underprepared teachers are concentrated in challenging schools, they are less likely to succeed, less likely to receive supports that might help make them successful, and less likely to persist.

Other states have closed alternative routes into teaching or controlled them tightly, stopped emergency licensure, and matched high standards for students with high standards for teachers. Florida, too, should follow this path.

Continuing Professional Development

Building capacity in the teaching force means investing in human capital. Because the teaching required in rigorous, standards-based education systems differs from traditional teaching, professional development must go beyond what well-prepared early-career teachers know as entrants into the teaching profession to develop what expert teachers must know to practice effectively (Ball & Cohen, 1999; Cohen & Ball, 1999; Shulman, 1986; Sternberg & Horvath, 1995).

Contrary to the assumptions of those who believe that knowledge of the content area is sufficient background for teaching, studies of expert teachers indicate that, while experts have more knowledge than novices, “this difference has been less useful in understanding expertise than have differences in the way that knowledge is organized in memory” (Sternberg & Horvath, 1995, p. 11). Expert teachers are able to use their classrooms and the work of their students as opportunities for their own learning (Little, 1999; Spillane & Louis, 2002). They know how to inquire into teaching and the improvement of teaching practice (Ball & Cohen, 1999), and they understand the political and social contexts in which they teach (Sternberg & Horvath). They are expert problem-solvers who are more likely to find novel and appropriate solutions to the problems they confront in their practice (Sternberg & Horvath). Expert teachers are able and willing to connect to resources outside their own classrooms (Lieberman & Miller, 1999; Spillane & Louis, 2002). Teaching capacity is a process, not an outcome (Elmore, 2000), knowing how to continue to learn from practice is an essential element of learning to teach (Ball & Cohen), and continuing to learn is a key expectation for teachers in robust standards-based systems.

Ironically, the career ladder for teachers created through 2003 legislative changes is based not on increased ability to teach children but instead on the expansion of teachers' roles and responsibilities to work with other adults. It does not address increasing capacity through continued professional learning.

Developing Teaching Capacity

The question is how policy can best support teachers as continuing learners and schools and school districts as learning organizations. A partial answer is provided by examining what has been done by school districts such as District 2 in New York City and San Diego in the implementation of standards-based reform (see, for example, Darling-Hammond, Hightower, Husbands, LaFors, & Young, 2002; Elmore & Burney, 1999). In San Diego, teacher shortages and emergency hiring were virtually eliminated so that all teachers hired were qualified. In both districts, systems were developed to align professional development with student and teaching standards. Colleges and universities were used to support district efforts, and graduate-level work was aligned with state and district priorities.

Extensive barriers exist to making the kinds of changes in teaching practice described above. In California, for example, state and local policy clashes created mixed incentives (see Darling-Hammond, et al., 2002). More deeply embedded barriers are found in the structure of school systems and the teaching profession. As Elmore (2002) and others have observed, nearly everything about teaching works against the view of teaching as a learning profession. Teachers typically work in isolation from other adults. Beginners and experienced teachers have identical job titles and responsibilities, and administrative positions which are more remote from classrooms typically pay more. Salary schedules are at best minimally responsive to teachers' efforts to learn and apply new knowledge and skills. Teachers' work is defined largely in terms of student contact, and teacher contracts are aligned with student hours and contact days.

Teachers are knowledge workers, and their work includes continuing to learn in order to strengthen their professional practice. Failure to attract, support, and develop highly qualified teachers dooms Florida's efforts at standards-based reform. Investment in teacher quality is a crucial capacity-building mechanism. Recent legislative changes in Florida requiring that a portion of teachers' salary increases be based on performance may be steps toward building capacity, depending on how these programs are implemented.

School Resources to Support Teaching and Learning

Identifying resources necessary to support increased capacity is risky business. Nearly every resource that common sense suggests (e.g., small classes, small schools, additional instructional time) has both been supported and discredited by research. The most likely reason for these mixed results is that resources are not sufficient in themselves. Teachers and students cannot use resources they don't have, but the presence of resources says nothing about their use (see Cohen, Raudenbush, & Ball, 2003). However, four kinds of resources seem particularly important to increased teaching and learning in schools: time on task, reduced class size in the early grades, smaller school size, and instructional program coherence.

Time dedicated to academic concerns is an essential school resource. Educational research indicates a positive relationship between time-on-task and student achievement (Fisher & Berliner, 1985; Hossler, Stage, & Gallagher, 1988; McGarity & Butts, 1984; Rosenshine, 1979; Seifert & Beck, 1984). The value of time-on-task relates to what happens during the time. For example, time-on-task used in interactive activities between students and teachers produced greater achievement and better attitudes than time-on-task seatwork assigned to students by teachers (Helmke & Schrader, 1988; Rosenshine; Strother, 1984). Specifically, the use of immediate feedback and correctives in classroom recitations; focused questions, praise, and reinforcement; listening and thinking during classroom interactions; and discussion/review, reading aloud, and verbal drill and practice were identified as interactive activities that capitalized on student and teacher time in classrooms (Cotton, 1990). To make the best use of available time, schools should ensure that nonacademic activities, procedures, and disruptions in classrooms are held to a minimum and teachers should be expected to use classroom time effectively.

Reduced class size is another relevant school resource. As noted in Dominic Brewer's policy brief in this series (Brewer, 2005), several studies indicate that reducing class size could increase the capacity for students to learn, especially in grades K-3 (Finn, 2002; Finn & Achilles, 1999; Nye, Hedges, & Konstantopoulos, 2001). Research on Project STAR in Tennessee demonstrated that small classes had significant benefits on academic achievement for K-3 students, especially minority students (Finn). Other findings included better teacher morale, more time for teachers to provide direct instruction instead of dealing with discipline problems, more student engagement in classroom activities, higher student retention rates in grades, and lower student dropout rates (Finn). Placing fewer students in classrooms makes it possible for teachers to spend more time teaching and provide students with more individual attention. However, this result is not a given, as the effects depend on what happens between students and teachers in classrooms as a result of class size reductions. Average class sizes in Florida have been large in comparison with other states (*Education State Rankings 2002-2003*, 2002). However, Florida's class size reduction amendment is overly broad, and implementation will reduce

the resources available for other, perhaps more powerful, capacity-building policy mechanisms.

School size is a similar kind of resource. Larger schools may have greater capacity to provide more advanced classes, an advantage given the objectives of standards-based school reform. However, research indicates the effects of school size on both teacher attitudes toward collective responsibility for student learning (Lee & Loeb, 2000) and student learning itself (Fowler & Walberg, 1991; Lee & Loeb). Gains from large schools in terms of efficiency and economy of scale may be offset by losses in terms of student engagement, teacher responsibility, and community involvement. This calls into question Florida's reliance on large school districts, and large school buildings.

Instructional program coherence is also a resource that can support teaching and learning. One impediment to the implementation of comprehensive school reforms has been inconsistency and lack of coherence among school-level initiatives and between school district and state-level reform efforts (Desimone, 2002). Coherence, in contrast, means that "policy instruments coexisting within an education system are mutually reinforcing" (Porter, 1991, p. 16). Curriculum policy instruments such as subject matter standards, student assessments, textbooks, high school completion requirements, guidelines for use of instructional time, professional development requirements, accreditation and school evaluation models, and university entrance requirements all impact whether the curriculum at the classroom level is coherent. If these policy instruments are unsynchronized or contradictory, reform efforts are diluted. Researchers examining coherence at the school level noted that it required not only common instructional frameworks but also stable working conditions and resources that supported implementation (Borko, Wolf, Simone, & Uchiyama, 2003; Newmann, Smith, Allensworth, & Bryk, 2001). They also cautioned that coherence is a strategy, not a substitute for essential supports for teaching and learning.

Family and Community Supports for Teaching and Learning

The third focus for building capacity acknowledges that families, neighborhoods, communities, and states are key actors in the support of teaching and learning. What children bring to school and the reinforcement of schooling in out-of-school activities are key components of children's capacity to learn. Similarly, teaching in the ways described above must be supported by stakeholders in order to persist in spite of inevitable resistance and misunderstanding. The development of civic capacity is an important component of school reform (Stone, Henig, Jones, & Pierannunzi, 2001).

Building Capacity in the Neighborhood and Community

Parents' abilities to support their children's academic growth and development differ widely. Hart and Risley's (1995) study of parent interactions with children between birth and age three demonstrated substantial differences between parents by economic level. A more recent ethnographic study of class differences indicated that middle class parents have greater resources for dealing with school problems and more ties to networks of other parents than working class and poor parents (Horvat, Weininger, & Lareau, 2003). Without additional knowledge and skills, many parents are unable to support their children's cognitive development or assist their children with their homework assignments. Parent involvement is one of the six target areas in the federal *No Child Left Behind* legislation, and the most robust early intervention programs such as the High/Scope Perry Preschool model and the Title I Chicago Child-Parent Centers have a strong parent component (Reynolds, Temple, Robertson, & Mann, 2002).

Research examining the efficacy of parent involvement on children's learning has been mixed. Some studies indicate that parents generally want and need help to become effectively involved in their children's education and that providing education for parents who want to be involved enhances the effectiveness of their participation (e.g., Cotton & Wiklund, 1989). However, a recent review of evaluations of parent involvement programs indicated only modest empirical support for such claims (Mattingly, Prislun, McKenzie, Rodriguez, & Kayzar, 2002). These results may, however, stem from weak evaluation designs and outcome measures as opposed to weak connections among the variables. The general perception among both the public and policy makers is that if parents are involved in their children's learning at high levels, children's achievement levels will be greater, and robust studies tend to support that claim (e.g., Reynolds, Temple, Robertson, & Mann).

Research indicates that early childhood care and education programs can produce large short-term benefits on the intellectual abilities of children from low-income families, and sizable long-term effects on their school achievement, grade retention, placement in special education, and social adjustment (Barnett, 1995; Barnett, Young, & Schweinhart, 1994). Five of the 11 studies of model early childhood programs discussed in Barnett's 1995 article found statistically positive effects on low-income students' achievement test scores beyond the third grade. In all 11 studies, the findings provided overwhelming evidence that early childhood programs can produce sizeable improvements in low-income students' school success as measured by their grade retention rates and placement rates in special education. While many early childhood education programs have demonstrated the capacity to teach and prepare children to learn at high levels in kindergarten and beyond, many children who enter kindergarten have not had opportunities to attend such programs (Campbell & Ramey, 1994). The recent Florida

constitutional amendment on universal prekindergarten addresses this need.

Similarly some students benefit from more time spent in school-related and supporting activities. Summer loss for children of poverty is a well-documented phenomenon (Alexander, Entwisle, & Olson, 2001; Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996). Recent research documents that children from poor, middle class, and affluent families make similar gains in first through fifth grades if test results from the beginning of the academic year are compared with end-of-the-year results. Most state accountability systems, however, test only once a year, typically in the spring. Spring test results are the accumulation of summer loss and school-year learning gains. Because disadvantaged children have fewer out-of-school resources to support their learning, policies that establish year-round schooling, high-quality after-school and summer programs, good preschools, increased access to books, full-day kindergarten programs, and home-school partnerships are likely ways to address this problem.

Participation in after-school programs can help students achieve higher grades and test scores, especially low-income students (Baker & Witt, 1996; Brooks & Mojica, 1995; Chicago Public Schools Office of Schools and Regions, 1998; Davis, 2001; Miller, 2001). Studies link students' involvement in after-school programs with improved attitudes toward school, higher expectations of school achievement, better work habits, and higher attendance rates, especially for low-income students (Miller; Schinke, Cole, & Poulin, 1998). One of the most impressive findings of the research on after-school programs is that the students who participate in them have a significantly lower involvement in risky behaviors, including less involvement in drinking, smoking, drug use, having sex, and becoming involved in violence (Gregory, 1996; Miller). These students exhibited better social and behavioral adjustment, better relations with peers, more effective conflict-resolution strategies, and increased parent involvement (Gregory; Miller).

While the primary focus of after-school programs should be on reinforcing and enhancing the knowledge that students learn in schools, simply extending traditional academic programs may not be the answer. In Baltimore researchers noted that more advantaged children had access to many city resources and participated in fairs, carnivals, athletics, museums, and zoos (Alexander, Entwisle, & Olson, 2001). As a result, school learning was supplemented with enrichment experiences that applied learning in engaging non-school venues.

Capacity through Policy Stability and Coherence

Policy making can support or inhibit developing capacity for teaching and learning. Policies intended to support the development of high-quality teaching and learning should be evaluated using three essential criteria. First, policy strategies should be expected to both produce widespread change and enhance equity (Darling-Hammond &

McLaughlin, 1999). While school system and statewide change might begin with pilot programs and small-scale reforms, standards-based reform efforts with high achievement for all students aspire to change the whole system. At the same time, reform efforts must avoid differential negative impact on those children currently least well-served by public education.

Second, policy must be grounded in teachers' and children's needs and the needs of the communities and neighborhoods in which they learn and teach. As Elmore (2000) noted, policy makers know little about the core of the teaching and learning process and must depend on those more knowledgeable about it. However, teachers need assistance in escaping from isolationism. The antidote, Elmore argued, is to "surround practitioners with dozens, perhaps hundreds, of examples of systems that have managed to design their institutional structures around large scale improvement" and to use policy "to stimulate demand for such knowledge" (p. 29).

Finally, policy must be coherent and consistent. Instead of simply adding new requirements in attempts to improve educational systems, each new policy must be evaluated for its consistency or lack thereof with other, relevant policies. Florida educational policy is filled with incongruities and mixed incentives. This is understandable in that the rewards for policy makers come from initiating reform, not in supporting and ensuring its implementation (Hess, 1999). Susan Fuhrman described the strong incentives for superficiality and instability in policy making (1993), and the disincentives for consistency and coherence. Term limits have exacerbated the problem by making it less likely that officer holders will be willing and able to take a long view and, at the same time, educate themselves about the complexities of the problem they seek to address.

Examples of Successful Capacity Development

Results from high-performing school districts and states illustrate the influence of the capacity-building elements described in this policy brief. Specifically, we describe the U.S. Department of Defense schools, middle school science achievement in Minnesota, and increasing student achievement in Connecticut as examples of the pay-offs to increased capacity.

Researchers and policy makers have noted the student achievement for schools operated by the Department of Defense Education Activity (DoDEA). DoDEA includes the 157 Department of Defense Dependent Schools that serve children of military personnel who are stationed abroad and the 70 Department of Defense Domestic Dependent Elementary and Secondary Schools that serve the children of personnel stationed within the United States. Together, these schools serve 112,000 students, of whom 40% are

minority, 50% qualify for free and reduced-price lunch, 35% are transient, and 80% are the children of enlisted personnel. Despite these student characteristics which make the DoDEA schools similar to those in large, urban school districts, DoDEA students score high on the National Assessment of Educational Progress. DoDEA student results were exceeded only by those in Connecticut and Maine on the 1998 NAEP assessments of eighth-grade reading and writing. Minority student performance was high compared to that of minority students in the states, and the gaps in performance between minority and white students were below the national average.

Researchers who examined the DoDEA middle schools concluded that the following factors accounted for the high academic achievement:

- Centralized direction-setting with local decision making.
- Policy coherence and regular data flow.
- Sufficient financial resources linked to instructionally relevant strategic goals.
- Staff development that is job-embedded, intensive, sustained over time, relevant to school improvement goals, and linked to student performance.
- Small school size, conducive to trust, communication and sense of community.
- Academic focus and high expectations for all students.
- Continuity of care for children in high-quality preschools and after-school programs.
- A “corporate commitment” to public education that is material and symbolic and that is visible and responsive to parents within the school community. (Smrekar, Guthrie, Owens, & Sims, 2001, p. i).

Researchers also noted that DoDEA teachers were generally experienced, and over 65% had graduate degrees. Tracking of students by ability was rare. Together, these factors indicate that DoDEA schools have benefited from many of the capacity-developing mechanisms identified in previous sections of this policy brief.

An anomaly in the results of the 1995 Third International Mathematics and Science Study (TIMSS) caught the attention of policy makers and researchers. Student achievement results in Minnesota were generally higher than those for the United States as a whole but paralleled the national data, with higher scores compared to other countries at the fourth-grade level and declining scores at the eighth- and twelfth-grade levels. Results in eighth-grade mathematics were similar to but somewhat higher than those of the U.S. generally. The results for eighth-grade science were quite different: Minnesota eighth graders scored higher than eighth graders from any other state and higher than any other country with the exception of Singapore. As a result, researchers were interested in understanding the reasons for these results.

The National Education Goals Panel commissioned three papers to examine the factors that might explain Minnesota eighth graders' exceptional achievement in eighth-grade science. The following factors were identified:

- A focused, coherent science curriculum formulated and agreed to by the science teachers of the state;
- Instruction that involved students in the active doing of science, both in and out of the classroom; and
- Absence of tracking, resulting in the same learning expectations and exposure for all students to science content, concepts, and skills deemed important. (Raizen, 2000).

Other researchers noted that teacher certification requirements supported the eighth-grade science curriculum (Houang, Schmidt, & Cogan, 2000); that materials, curriculum, and instruction were aligned for science, while they were not for mathematics (Linder-Scholer, 2000); that fewer science topics were covered in more depth; and that continuity in the curriculum over time provided teachers and administrators an opportunity to improve their professional practice. These papers did not purport to find causal linkages between the factors identified and science achievement, but the differences in eighth-grade science and mathematics in terms of both system capacity and student achievement establish an argument for the relevance of these factors.

As a final example, we turn to Connecticut, winner of the 2002 "Smartest State" award (*Education state rankings*, 2002; Florida's rank was 47). Connecticut has been able to obtain high student achievement and substantial gains in student achievement as measured both by the National Assessment of Educational Progress (NAEP) and the Connecticut Academic Performance tests; it also has narrowed the achievement gap between minority youth and their white counterparts. Two important points are generally referred to in describing Connecticut's efforts: 1) the efforts centered on improving teaching and 2) they have persisted over a long time through changes in the governor's office, the legislature, the leadership of the state education department, and funding sources (Wilson, Darling-Hammond, & Berry, 2001).

Connecticut's approach to improving teacher quality targeted four issues: recruitment, initial preparation, induction of new teachers, and continuing professional development. A plan developed in the mid-1980s called for raising teachers' salaries while raising the standards for preparation and accountability. Teacher salaries in Connecticut are now second only to those in California (National Education Association, 2003), and expenditures per pupil are among the highest in the country. The Connecticut system combines low-stakes student testing with results-driven decision making about curriculum, instruction, and professional development. Connecticut eliminated emergency licensing and limited temporary licensing for teachers, provided scholarships

and forgivable loans to attract high-ability candidates, established an outcome-based program approval system for teacher preparation, developed a staged licensing path that included a beginning teacher program, and required a master's degree for obtaining a full professional license. As a result of these efforts, teacher shortages were reduced and over 80% of the teachers hold master's degrees, compared with 47% nationally and 33% in Florida. Connecticut created a "package of policies" no element of which would have built capacity in the absence of the others.

Conclusion

Florida's long-standing and intense focus on accountability and standards is in many ways admirable and is a necessary condition for educational reform in a system marked by a history of poor academic performance in the public schools. However, accountability is not enough. Accountability must be combined with capacity-building in order to achieve the results that state business, political, and educational leaders seek. This policy brief describes several important elements of an educational system with the capacity to support teaching and learning and provides examples of states and systems that have used these elements to support student learning gains.

Developing capacity is an investment. Florida, one of the richest states in the country as measured by personal income per student, must match its fiscal capacity with the will to make this investment in public education. The Florida Constitution describes education as a "fundamental value of the people of the State" and calls for a "uniform, efficient, safe, secure, and high quality system of free public schools that allow students to obtain a high quality education." Such a system cannot be achieved without matching the state's long-standing fixation on accountability with an equally strong commitment to capacity-building.

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