Principles and Exemplars for Integrating Developmental Sciences Knowledge into Educator Preparation

John Snyder and Ira Lit

NCATE
The Standard of Excellence in Teacher Preparation

Preface

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This brief is a summary of *Principles and Exemplars for Integrating Developmental Sciences Knowledge into Educator Preparation* by Jon Snyder and Ira Lit. It includes highlights and policy recommendations contained in that paper.

This brief and the longer paper from which it is drawn were commissioned by the National Council for Accreditation of Teacher Education (NCATE), with funding from the Strategic Knowledge Fund, a partnership between the Foundation for Child Development and the W. K. Kellogg Foundation. The Strategic Knowledge Fund supports projects that increase knowledge about children from birth to eight years old and their families, particularly children who are at risk for poor educational outcomes. The Strategic Knowledge Fund provided support to NCATE to promote "integration of child and adolescent development deeply and concretely into the preparation of America's teachers." The A. L. Mailman Foundation also supported this project.

NCATE conducted a reputational study and with the support of the Foundation for Child Development, created a National Expert Panel on Increasing the Application of Knowledge about Child and Adolescent Development and Learning in Educator Preparation Programs. The Panel met four times during 2008-2009 and produced two commissioned papers (briefs of which are designed for policymakers as well as educators), as well as a final report, entitled *The Road Less Traveled: How the Developmental Sciences Can Prepare Educators to Improve Student Achievement*. All are available at www.ncate.org. The papers may be downloaded from the website or are available as publications by clicking on Publications at www.ncate.org or clicking on "Public" and "Research/Reports."

This work was preceded by a collaboration between the National Institute of Child Health and Human Development and NCATE to determine the current state of integration of child and adolescent development in educator preparation programs and the current state of the science of child and adolescent development. The effort found gaps between what is known and what is taught in educator preparation programs. The report is at www.ncate.org. The Foundation for Child Development took a next step by initiating the effort that produced this paper and other related materials to set forth actionable recommendations to the education and education policy communities.

It is the strong desire of the Strategic Knowledge Fund leadership that the recommendations contained in the papers and final report of this effort receive the utmost attention in the education and policy communities and that the organizations named in the section on policy recommendations, as well as other education stakeholders, take concerted and timely action to implement the recommendations.

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Introduction

Recently, in an effort to improve the education and subsequent life opportunities of our nation's children, 48 states have committed to use newly developed, common national academic standards and possibly institute some common measures for assessing student learning related to these standards. This is an impressive undertaking. However, research over the past decade indicates that this effort is more likely to be successful if it is grounded more deeply in the science and principles of the developmental sciences.[1] A recent report by the National Institute for Child Health and Human Development (NICHD) says "current research points to the fact that aspects of development—neural, cognitive, social, psychological, physical and ethical—have far-reaching effects on children's ability to learn." In other words, educators need access to scientifically based knowledge about how students develop and learn in order to improve students' ability to engage with and learn from the curriculum. But many educators—teachers and administrators—have not been prepared to understand and apply developmental sciences knowledge in their classrooms and schools.

This brief[2] focuses on how professional education programs can help educators acquire and apply knowledge about child and adolescent development to support all the students in their care. Following a vignette that illustrates effective application of child developmental principles, we (1) identify some of the general areas of child and adolescent development and learning that will assist educators in helping students achieve their goals and become productive citizens; (2) discuss how educator preparation programs can be designed to help PreK-12 educators use this knowledge to create successful classroom and school environments; and (3) provide examples of how child and adolescent development science and principles are being integrated into actual educator preparation programs. We conclude with policy recommendations for how educator preparation programs and accrediting bodies can advance teacher knowledge and application of child and adolescent development.

There is now a well established body of scientific evidence on how children and adolescents develop and the role that classroom instruction and home experiences play in that development. Research in the fields of education and psychology clearly demonstrates the relevance and importance of addressing the full range of developmental domains in seeking positive school outcomes for students. Research tells us that student success in school requires a combination of social, emotional, and academic/cognitive competencies (NICHD, 2007; Durlak, et al. in press). Effective teaching requires the ability to successfully integrate these elements of the knowledge base for the profession to promote the learning and growth of diverse students across varying contexts and across multiple domains of human development (Darling-Hammond & Bransford, ed., 2005; see also Bransford, Brown, & Cocking, 2002; NICHD, 2007). This brief provides an exemplar of classroom teaching where that knowledge base is understood and effectively applied.

[1]The term "developmental sciences" includes the science of child and adolescent development as well as cognitive science and neuroscience. We have used the term developmental sciences in the title to emphasize the necessity for educator preparation programs to infuse current and established knowledge in these sciences into curricula for prospective educators, while emphasizing child and adolescent development knowledge.

[2]This document summarizes a longer paper of the same title by Jon Snyder and Ira Lit, available at **www.ncate.org**. All research citations are included in the longer Snyder and Lit paper.

What Educators Need to Know and Be Able to Apply from Developmental Sciences in Order to Improve Student Learning

Educators need not and in fact, cannot know everything that specialists know in all fields related to teaching. However, just as effective teachers must have a solid grounding in the subject matter they teach, they must also have considerable understanding of the field of child and adolescent development as it pertains to the teaching profession.[3] They must strive to understand fully the children whose learning and growth they have been charged with fostering, and apply a developmental perspective and sensitivity to their daily practice with students and families—in classrooms, schools and communities. Doing so not only makes learning an enjoyable and motivating experience; research shows the use of developmental principles can increase student achievement.

Following is an example of teaching that effectively applies knowledge of the developmental sciences:

Mary Gregg's Classroom

Mary Gregg is a Graduate of the University of California, Berkeley Developmental Teacher Education Program

Mary Gregg teaches in a portable classroom at Wilson Elementary School in an urban district in the San Francisco Bay Area. Wilson's 850 students, most of them English language learners, constitute the largest population of Title I-eligible students in the district. Mary's room, a small portable with a low ceiling and very loud air fans, has one teacher table and six rectangular student tables with six chairs at each. Mary, **a first-year teacher and graduate of the Developmental Teacher Education Program at UC, Berkeley** is responsible for 32 first graders (14 girls and 18 boys) without the support of a teacher's aide. Twenty-five of the students are children of color; a majority are recent immigrants from Southeast Asia with some African Americans and Latinos and seven European-Americans.

Despite the small size of the room, Mary fosters an active learning environment with her students. She has plastered the walls from floor to ceiling with student work: math graphs, group experience stories, and student collages. Hanging down from the ceiling (so that adults have to duck to wend their way through the room) are student-constructed science mobiles and a variety of What We Know and What We Want to Know charts. In one corner, a reading area is set up with books and a carpet.

At noon, half of her class leaves the room to participate with a bilingual class for the science lesson while half of the bilingual class comes to her. She groups the students in mixed language and gender cohorts and introduces the science activity she has designed. The room is full of materials needed for the lesson. There are cups in large tote trays; two trays filled with salt water and two with regular tap water; and small totes full of small plastic bears, different kinds of tiles, quarters, rocks, and paper clips. The lesson is designed to offer

[3] Proficiencies and core knowledge of child and adolescent development principles can be found in many sources; a few are listed here as examples: Eccles, J. & Appleton Gotman, J. (2002). *Community Programs to Promote Youth Development*.Washington, D.C.: National Academy of Sciences; Maholmes, V. (2005 & 2006). *Child and Adolescent Development Research and Teacher Education: Evidence-based Pedagogy, Policy, and Practice*. Bethesda, Md.: National Institute of Child Health and Human Development. Washington, D.C.: National Council for Accreditation of Teacher Education. http://www.ncate.org/documents/reearch/ChildAdolDevTeacherEd.pdf; Meece, J.L. & Daniels, D. (2007). *Child and Adolescent Development for Educators* (3rd Edition). New York: McGraw Hill.

students an opportunity to explore the relative density of two different liquids by exploring patterns in the number of objects (how much weight) it takes to sink the cup in the different types of water.

Before starting the activity she reads the labels and asks students to read the labels. She has the students point out interesting language and spelling features. Two children excitedly point out "That's the same weird spelling we saw this morning...." A "peace treaty" is hanging from the ceiling that lists a set of student generated rules which each individual student signed. It includes a promise to be peaceful in room 31, and, "to help make our room a place of learning and friendship," and the following pledges: "We won't pick on anyone. We won't fight at school. We won't mess up the room. We will be peaceful and good. We will listen. We won't say any bad words. We will be quiet. We won't fight with guns. We won't touch anyone's plant. We won't karate kick. We won't push." Mary is applying a finding from the developmental sciences: To be successful academically and socially, children need a set of social skills: cooperation, assertion, responsibility, empathy and self-control.

Once into the science activity, management appears invisible. There is, of course, some splashing and throwing things into the water, but as the lesson progresses, Mary engages in on-the-spot logistical management decisions. For instance, everyone is supposed to get a chance to go to the table to choose objects to be placed in cups. After choosing the first person to go, Mary sets them to the task. Very quickly, it is the second person's turn and the students do not know how to choose who should get the next turn. At first she says, "You choose." Then she, in the moment and before it happens, foresees a possible "It's my turn. No, it's my turn" problem and redirects them with a counter-clockwise motion to go around the table.

The 30-plus students conduct experiments, record on yellow Post-its how many objects it takes to sink the cup, and then place the Post-its on a large piece of chart paper she has labeled in two columns, salt water and tap water. At the end of the experiment, she brings the class together to discuss the recorded information. Students generate their own hypotheses and then, with teacher encouragement, match their hypotheses with the data. When the language becomes more abstract, she asks students to come to the front of the room and demonstrate their science concepts with the materials all had used. In California, this is one component of what is called Specially Designed Academic Instruction in English (SDAIE), a pedagogical approach focused on increasing the learning opportunities of English language learners.

Mary skillfully uses a range of other strategies throughout the day to keep her students working peacefully and purposefully. These include frequently praising those who are behaving, stopping and waiting until she has everyone's attention; questioning if all can hear; recording stars on the board when the group is attentive and erasing the stars to call their attention to the need to settle down; ending or extending an activity based on students' engagement and capacity to focus ("I have time for one more. Is the class ready for one more?"); and constructively refocusing disruptive behavior. To call the group together, she asks them to "sit on your stars." (Stars are marked on the group rug to help students locate a place to settle when the group needs to re-engage.)[4]

[4] This vignette contains minor edits to the original version [see Snyder & Lit (2010) available at www.ncate.org].

Such a small snippet of classroom life does not provide a full and rich description of what developmentally oriented teaching looks like in the life of a classroom. It does, however, provide a morsel of a vision of the holistic and complex enactment of such. While analysis can separate the domains of developmentally oriented practice, in Mary's classroom it is virtually impossible to divine where, for instance, one area of development is divided from another, or one developmental understanding is applied separately isolated from another. In fact, all of her pedagogical decisions consciously integrate what she knows of the development of her particular students, as she has been prepared to do through the developmentally-oriented preparation program she completed.

In the ***physical domain***, for instance, her use of collages, science mobiles, and the science lesson all provide for the development of small and large motor coordination. Her classroom is full of physical movement.

The most obvious example in the ***cognitive domain*** is the science lesson described where students generate hypotheses, record their observations, compile data, and match data with their hypotheses. The vignette is also full of examples of learning opportunities in literacy as well. For instance, Mary reads the labels and then asks students to read the labels and has students point out language and spelling features she has purposefully repeated in the afternoon science activity from the morning "literacy" activity.

In the ***linguistic domain***, Mary mixes language backgrounds for the cooperative group work, regrouping classes as well as mixing language backgrounds within groups for group activities. In this way, children are always learning social, as well as academic, English. She also provides a purposefully rich set of materials (slides, posters, tapes, and sensory rich media such as classroom aquariums, terrariums, field trips) in the classroom and for each individual lesson so that children, no matter the subject matter, are also always learning academic English. In addition, she provides an example of a well developed scaffolding technique to accommodate multiple levels of language proficiency within a single classroom by asking students to physically demonstrate abstract concepts when presented verbally so that all can "see" the concept.

An example of her work in the ***social domain*** can be seen in her group learning activities where tasks and rewards are structured cooperatively in ways that provide opportunities for learning group interaction skills (cooperative learning). Her mixing of gender, academic ability, and language backgrounds is an example of being consciously developmental regarding the fostering of cross-cultural social skills and is also an important component in the development of the ***ethical domain*** in a pluralistic democratic society.

Mary demonstrates understanding of another finding from the developmental sciences: How children learn is as important as what they learn; process and content go hand-in-hand.

By providing clear directions and meaningful, engaging tasks, she organized the science activity so that everyone could successfully participate. She was proactive in preventing potential problems. The decision on how to have the students decide who goes next to put objects into the water prevented students from acting out, thus keeping their emotions positive

and the atmosphere in the room constructive. Throughout the day she also positively refocuses disruptive behavior, and provides hands-on and minds-on activities such as the development of products, simulations, and research projects. In this way she avoids having to discipline and/or ostracize students who might have a difficult time fitting in to a more passive classroom.

Students in Mary's classroom have to meet high academic standards: matching data to hypotheses is a high level cognitive skill, often in short supply among adults! In addition, Mary provides multiple opportunities and avenues for students to demonstrate what they are learning, including performance tests, portfolios, and journals, among others. This too increases positive motivation, as well as keeping the classroom atmosphere a constructive one.

Physically, the fact that adults have to duck to avoid the multiple displays of student work, sends a clear message to students that this is their classroom. It belongs to them and they are safe and welcome here.

While maintaining academic standards, Mary uses multiple approaches (What We Know and Want to Know charts, extending activities based on student engagement and interest, and student experience stories) to assure that access to and progress through the content is a shared responsibility with her students.

Mary recognizes that language and culture play a major developmental role both in the classroom and the home contexts of her students. Thus, she integrates first language and culture into class activities and also includes community members as conduits of home and community languages and cultures into the classroom.

Mary also demonstrates her understanding that children are at different stages of cognitive development in the same classroom, by providing multiple ways for children to understand and experience new knowledge. The multiple math graphs adorning the classroom walls show that she provides visual representations arising from initial physical manipulation for abstract math concepts which is a particularly appropriate approach for the age group with which she works. There are several instances that show her ability to apply this understanding in the science lesson described. The science lesson was based upon an understanding of children's developing understanding of the physical world surrounding them. All the children had some, undoubtedly differing, experiential backgrounds with water and with objects floating. This activity tapped into their previous conceptions and partial understandings of the phenomena. She did not, however, let them flounder unnecessarily on their way to more sophisticated understandings but rather provided steps to help them understand (scaffolding towards a key concept) by having them organize their findings by salt water and tap water (rather than, for instance, the size of the objects to be floated which would have failed as an organizing hypothesis).

Mary is not a perfect teacher, though pretty remarkable for a first year professional. **Mary's preparation program has enabled her to effectively apply developmental principles**; her skill level can be contrasted with that of many new teachers who have not experienced this type of preparation.

As noted earlier, a strong body of research supports the type of developmentally-focused preparation program from which Mary Gregg graduated. For example, a metanalysis of 213 school programs implementing developmentally-focused approaches to social and emotional learning involving 270,034 K-12 students found an 11 percentile point gain in student achievement, reduced disruptive behavior, and increased prosocial attitudes and behaviors (Durlak, in press).

Developmental Sciences Principles in the Classroom

As demonstrated in the Mary Gregg vignette, effective teachers understand and practice the following principles:

- **Knowing the children we teach is as important as knowing the content we teach.**

Dr. James Comer of the Yale University Child Study Center outlines six interrelated areas of development as critical for teachers and schools to understand and attend to in creating successful schools and classrooms: ***physical*** (healthy physical functioning supports optimal academic learning); ***cognitive*** (the ability to think, plan, solve problems, set goals and work with focused attention); ***linguistic*** (the capacity to use language for comprehension, self expression and relationship building); ***social*** (the ability to build healthy relationships, know how to act appropriately in different social environments and appreciate differences among people); ***psychological*** (the capacity for autonomy, self-regulation, identity, and self confidence as well as the need for safety, belonging and competence); ***ethical*** (the ability to understand the collective good, justice, and fairness and the capacity to delay gratification) (Comer, 2004).

Children are born with potential for growth in each of these areas. Successful development in one area is connected to growth in others. Teachers who approach their task from a developmental perspective understand the importance of supporting children's growth in all these areas throughout their education.

For example, research has demonstrated that there are strong links between emotion and cognition and that emotional support from teachers is critical to children's development and capacity to learn. Educational experts describe three features of emotionally supportive classrooms: ***positive classroom environment***-as evidenced by an emotional connection between the teachers and students and students' feelings of safety and excitement about learning; ***teacher sensitivity***-reflected in the teacher's awareness of and responsiveness to students academic and emotional needs; and ***regard for student perspectives*** - the degree to which teachers place an emphasis on students interests, motivations and points of view. Research supports the conclusion that emotionally supportive classrooms enhance academic learning outcomes for students (Pianta, 2009).

A 2002 meta-analysis (Borman, Hewes, Overman, and Brown, 2002) found that the Comer School Development Program, based on developmental sciences knowledge, was one of only three school reform models "to have clearly established, across

varying contexts and varying study designs, that their effects are relatively robust and that the model[s], in general, can be expected to improve students' test scores."

In summary, educators with a developmental orientation apply their understanding of the developmental sciences in ways that help them grow classrooms and instructional programs to support their students' academic learning and their full human potential.

- **Effective teachers understand that students respond differently to similar opportunities, based in part on the strengths and vulnerabilities they bring to school.**

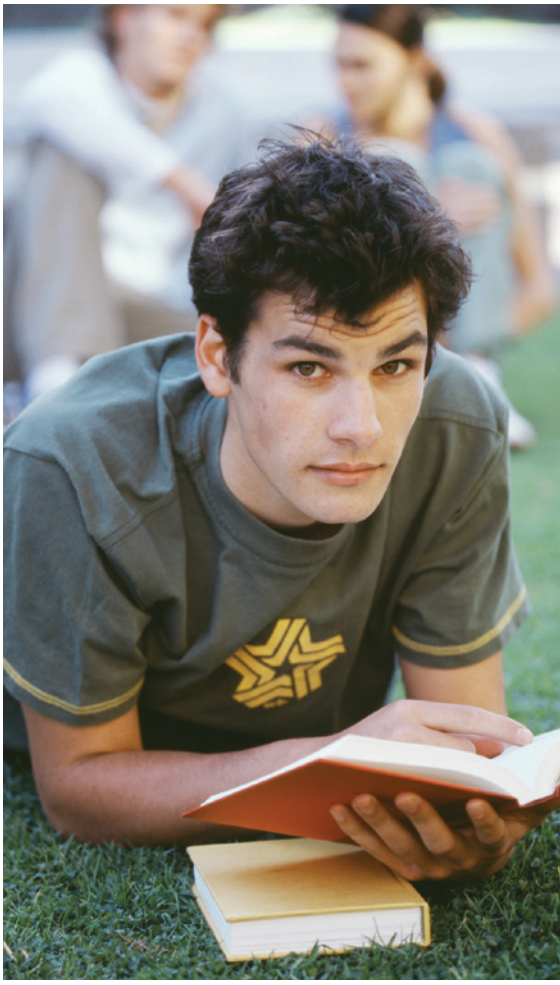
Academic "readiness" and school achievement are products of a student's current skills, knowledge, and abilities in reciprocal interaction with the various environments in which children are reared and taught. Knowing that students respond differently to similar opportunities, effective teachers understand that they need to enact varied approaches to their work to help all children be successful (e.g. Mary Gregg's multiple types of classroom supports to learning).

Also, studies show that students vary in the strengths and vulnerabilities they bring with them to school. Effective teachers are able to recognize the impact of these factors and create school and classroom environments that promote the strengths and address the risks, thereby enriching learning and development (Spencer, 2006).

In children and adolescents, affect drives cognition. Children of all ages function better when they have confidence in a secure base to which they can turn for support if needed. When children have the support they need, they explore more competently, are less fearful, and are able to give more focused attention to cognitive tasks (NICHD, 2007; Bowlby, 1988; Cassidy, 1994; Cassidy & Shaver, 1999; Hamre & Pianta 2005).

Recent findings from neuroscience support such an approach to classroom teaching. Teachers should be aware that the most successful classroom contexts are the ones that provide a protective, healthy, nurturing environment; a stable, supportive and caring social community; and a variety of experiences that promote individual growth and development. Teachers must also understand that children are influenced by, and in turn influence, their home communities and cultures and that these reciprocal influences affect development and learning.

- **Children in the same classroom are at different stages in the multiple domains of development; teachers must understand and be able to apply effective strategies to meet the range of needs of diverse students in their classrooms.**



As children develop, the ways in which they learn change. If teachers are tuned to these phases of development, then they can be more thoughtful about how they design their lessons, pace their instruction and move kids along from one concept to the next. Doing these things will build students' ability to think critically and take on more and more complex tasks as they grow.

Linda Darling-Hammond, The Learning Classroom (2009)

Effective, developmentally oriented teachers understand that children change as they develop—according to age and other biological, social and cultural factors. Teachers who understand these developmental changes can tailor their instruction accordingly. For example, Eccles describes the rapid biological changes experienced by children in early adolescence and the potential "for both positive and negative outcomes" during this period. Teachers with an understanding of these patterns of growth and development are better able to create learning opportunities that are most successful with their students.

Further, effective teachers understand that development in different areas occurs at different times for different children. Children's prior experiences, current interests and skills, and learning contexts all influence what they are ready to learn next. Effective teachers are able to observe and assess where students are in their development and support them toward new accomplishments. Thus, effective teachers recognize that the relationship between instruction and student development is complex and varies with every child. A child's development in a particular academic subject cannot be separated from the emotional, social or cognitive changes that accompany it. As Amber Damm, Minnesota Teacher of the Year 2009 states, "The work of integrating the ethical, intellectual, moral, academic, social and personal is the heart of our mission as teachers." A developmental approach to teaching requires a constant fine-tuning of instructional approaches to account for student differences: ongoing assessment, thoughtful planning, feedback and flexible revision along the way. For example, Sharon Griffin has done extensive work in mapping a developmental approach to teaching early mathematics that can apply to other subject areas more broadly. She suggests that teachers should build on students' current knowledge; select learning objectives that are a natural next step for students; make sure students consolidate one level of understanding before moving to the next; and give students opportunities to apply concepts in a broad range of contexts to help solidify understandings (Griffin, 2007). Effective teachers also understand there are typical hurdles that can occur for students in learning particular academic subjects and, in response, craft appropriate instructional plans for students.

The essential task of any successful educator is to combine a depth of knowledge about students with a thorough understanding of the subject under study and to bridge the two with appropriate instructional plans and pedagogical tools. Indispensable to that process is the knowledge that human development displays complex patterns and variation, and effective teachers are able to draw upon that knowledge in service of the growth and learning of their students.

Reshaping Preparation Programs to Include Knowledge and Application of Developmental Sciences

Child and adolescent development is all too often overlooked in current policy debates in education—thought to be fluff material about "self esteem." If we truly wish to enhance learning opportunities for students, however, there is a need to include developmentally oriented instruction in our schools and classrooms. Therefore, educator preparation programs must be strengthened so that educational professionals are equipped to address children's developmental needs. This task requires rethinking and reshaping policies and practices in these programs—a task that presents multiple challenges. The challenges include:

- **Insufficient coursework in child and adolescent development.**

In a recent survey, nine out of 10 education programs reported that teacher candidates are required to take at least one child and adolescent development course. However, half of the survey respondents (which included dean and faculty members) felt that a single course was insufficient.

- **Disconnect between theory and practice and lack of appropriate and current curriculum materials.**

In an NCATE survey, 80 percent of programs reported that the school of education offers courses in child/adolescent development. The 20 percent of programs that do not offer courses in child development either rely on psychology departments for the course, where connections to the classroom may be less likely, or forego it altogether due to state caps on credit hours for teacher education. The curriculum materials currently available for developmental courses tend to be geared to a broad audience and do not provide sufficient focus for prospective educators. These texts often provide minimal connections to classrooms and lack practical examples for helping educators apply their growing knowledge of child and adolescent development. Also, often these "mixed audience" textbooks have a difficult time keeping up with rapidly expanding knowledge in the field of child and adolescent development. The latest research is generally available in research journals and other more frequently disseminated sources. However, even these research journals do not serve prospective educators well since the findings presented do not directly translate into strategies for practice in the classroom.

- **Overall lack of cohesion in programs.**

In too many programs there are limited connections among coursework, clinical experiences and supervision. Frequently, coursework is provided by one set of faculty, clinical supervision by another set and school-based support by still another—with limited, if any possibility for productive exchange among these educators.

All of these realities represent significant challenges to meeting the common goal of high level student learning. However, the task of integrating child and adolescent development into educator preparation may in fact be an opportunity to integrate programs and thus to improve the education of our children.

Principles for Integrating Child and Adolescent Development in Educator Preparation

If teachers are to apply knowledge of child and adolescent development to their classrooms, educator preparation programs must offer a framework based on the most up to date research about how students develop and learn. What follows are six principles for educator preparation, grounded in tenets of child, adolescent and adult development. Examples of how these principles are being practiced in existing programs are also included.

- **Consider teacher candidates as developing adult learners.**

Whether young or more mature, aspiring teachers are in the process of growing into the profession. In teacher education, the teacher candidate is the student and object of the professional education process. As with the education of all learners, potential teachers need to be approached in developmentally meaningful ways. At Bank Street College of Education, this principle is put into practice through an approach called developmental interaction. Teacher candidates are expected to think about education in terms of children's developmental needs, characteristics, families and culture. At the same time candidates are encouraged to use their own direct experiences to expand their knowledge base, and develop a sense of mastery and competence. An example of how developmental interaction is used at Bank Street is the weekly group meetings that candidates attend with an advisor and five to seven peers. Discussions at the meetings are open-ended and student teachers bring personal as well as professional experiences to the group. These meetings provide the kind of nurturing, stimulating environment for candidates that they are encouraged to provide in classrooms for their own students—demonstrating the idea that the learning processes for children and adults are similar in many ways.

- **Provide opportunities for learning and applying principles of child and adolescent development by integrating developmental sciences principles throughout the curriculum.**

Educator preparation programs can promote candidates' knowledge of child and adolescent development by providing quality coursework. Programs should include practical examples and clinical experiences that help developing teachers make connections between theory, research and classroom life. In the University of California, Berkeley's Developmental Teacher

Education Program, student teachers participate in a two-year sequence of courses on human development. The course uses two approaches—the systematic observation of children, and child case studies—to shape student teachers' learning of child development principles. Issues of culture, context, and diversity are raised in both coursework and clinical work. Supervision is provided through highly experienced staff who are thoroughly grounded in child and adolescent development research and instruction. **Mary Gregg is an example of the type of teacher who graduates from the program.** This program infuses developmental sciences knowledge and application throughout coursework and clinical practice. Faculty coordinate their efforts as they scaffold candidates' understanding and ability to apply developmental principles.

- **Organize experiences for candidates to apply child and adolescent development principles in classrooms, schools, and communities.**

Successful educator preparation programs promote the application of child and adolescent development principles by providing deep and sustained opportunities for teacher candidates to practice teaching. These experiences must provide student teachers with ample practice under the supervision of mentors and teachers with expertise in child and adolescent development; a placement site that provides multiple opportunities to practice applying child and adolescent development principles with students and their families; preparation to operate in schools and school districts as they are while trying to change them for the better; and sufficient time and support to master the task of learning and applying child and adolescent development principles. Some urban teacher residencies offer a model that provides teacher candidates multiple supports for learning and applying child and adolescent development principles. These residencies provide a year long placement; a school site willing and able to take on the roles of educating children and prospective teachers; relationships that support adult learning and reflection, including a close individualized mentor and structured peer support; and a schedule that demands that candidates, teacher-mentors and academic instructors work together to test research and theory in practice by enacting them where they matter most.

- **Design programs with a consistent emphasis on child and adolescent development.**

Programs that are focused consistently help candidates acquire and apply the knowledge, skills, and dispositions necessary for effective teaching. This requires educator preparation programs to have a shared vision of quality teaching that informs the program's structure, design, and decision-making and that is offered consistently across all programmatic components. This type of program provides multiple opportunities for teacher candidates to learn and apply knowledge of child and adolescent development and do so in ways that produce the types of teachers our children need and deserve. The Yale School Development Program (SDP) demonstrates this type of program consistency by spanning the divide between PreK-12 schools and educator preparation institutions. SDP was established as an effort to spread a developmental framework throughout an entire teacher education program and includes a deep commitment to using schools as the laboratory where teacher candidates hone their practice. Working with each partnering institution, SDP helps schools of education place faculty in the field to support changes in school and classroom practices, helps teacher candidates learn to apply developmental principles in these schools, increases the number of candidates working in schools with a disproportionate number of academically disadvantaged students, and supports changes in teacher education programs that strengthen candidates' capacity to apply child and adolescent development principles in traditionally underserved schools and classrooms.

- **Model professional teaching practices.**

Certain approaches are particularly useful in helping teacher candidates practice skills and develop expertise in applying knowledge of child and adolescent development. Case studies and performance assessments are two such strategies. For instance, a preparation program can start using case studies by having teacher candidates analyze existing cases of high-quality, developmentally oriented teaching. Later candidates can use their growing knowledge from coursework and classroom practice to develop their own cases, examining the cases for insights that lead to improvements in instructional skills. This repeated and progressive use of case methods can help candidates connect coursework to classroom experience, challenging them to observe children's growth and development closely and look for clues about strategies that promote or constrain learning. Performance assessments are founded on the idea that learning and development can be assessed over time and in interaction with teaching materials, peers, and others. They provide opportunities for beginning teachers to learn, practice, and assess their growing knowledge and skills and demonstrate their growing capacities to others. Through performance assessments, candidates are engaged in the learning process, rather than being passive recipients of instruction.

In the Stanford Teacher Education Program (STEP), a course on adolescent development is required of all secondary candidates. The capstone assignment for the course is an in-depth case study of an adolescent from the candidate's year-long placement in one of the STEP partner schools. The case study assignment gives candidates the opportunity to look carefully at a growing adolescent to understand all aspects of his/her development; examine how different social systems (school, peers, family) influence the adolescent's development; apply insights and principles from adolescent development research to a specific individual; and learn to see and interpret the world from another's perspective. Understanding what is important to the adolescent leads to more effective practice as it helps educators develop classroom strategies to teach subject matter in ways that engage curiosity and the adolescent's growing need for independence.

- **Shape programs and practices through continual improvement.**

The knowledge base for the teacher education field, particularly in the areas of the developmental sciences, is growing rapidly, as are the contexts in which teachers work and children live and learn. Therefore, it is the responsibility of both educators and preparation institutions to enrich and revise practices, programs, policies and partnerships on an ongoing basis. Continuously renewing educator preparation programs and practices means (1) programs' practices, policies, and outcomes should be transparent, well defined, and thoroughly assessed; (2) high-quality programs, practices, and policies should be shared both within and outside the educator preparation community in order to engage teaching professionals and support informed decision-making; and (3) programs should be revised and improved periodically through institutional review and analysis, in an effort to focus on the ultimate goal of improving education for children. In sum, professional educational institutions must also be on a developmental trajectory, supported by administrators, faculty, and staff who will nurture their growth and help achieve the outcomes—for programs, graduates, students, and families—that we all desire.

Putting It All Together

Erikson Institute is an independent institution of higher education that prepares candidates at the graduate level for leadership roles in the child development professions. The Institute provides an example of how one program enacts all six principles of practice and integrates them into a cohesive whole.

- **Viewing candidates as adult learners.**

The Erikson approach respects candidates as adult learners. "Reflection" is a core value of the program, since adult learning is enhanced by having experiences, gaining knowledge, and then having the opportunity to, as one faculty member put it, "set the camera in slow motion." This reflection is one of the ways adult learners move from seeking "the answer" to understanding that in becoming an effective teacher, there is no simple right answer. The answer is almost always, "it depends." Candidates have the flexibility to choose either two or three years to complete the program, and courses are offered in the morning and evening to accommodate busy adults. They are also part of a stable group (a cohort), another source of support for learning about the complexities of human development. The program emphasizes candidates' learning with and from each other. As candidates progress through the program, they present their work to peers, work in groups, and participate in evaluating each others' final assignments.

- **Learning the developmental sciences knowledge base during coursework and experiences.**

Through its entirety, the program provides opportunities for candidates to integrate knowledge of child development and associated teaching strategies along with subject matter. The first year of coursework focuses on all domains of child growth and development. Candidates interview families and caregivers, placing the child's cultural background solidly in the developmental mix. In the second program year, candidates learn to apply teaching methods, and they evaluate and reflect on the effectiveness of their strategies as they analyze student achievement. They learn the state standards for various school subject areas, current educational policies and practices, and how to handle the demands of working daily with groups of children while considering the children's families, communities, and cultures.

- **Applying the knowledge base in classrooms, schools, and communities.**

Erikson Institute understands that candidates must have opportunities for both learning and applying knowledge of child growth and development. The director of teacher education helps to locate high quality clinical experiences and student teaching sites. Nearly all student teaching assignments are in Chicago Public Schools, in carefully selected and supported classrooms. All clinical experiences are linked with coursework, tutorials and small "interactive seminars" where candidates are encouraged to reflect on and "notice deeply" what is happening, not only with the children but within themselves.

- **Ensuring program consistency.**

While Erikson Institute argues that no one theory, perspective, or approach can meet all the needs of all the children all the time, the program has a very clear and explicit set of values and expectations. Among these are

- Child and adolescent development includes not just the individual, but families, communities, and cultures;
- Program coursework should be linked with the real world of classrooms and schools;
- Children, especially those who have been underserved, should be the focus;
- Education is a path to making sense of and improving the worlds in which we reside;
- Candidates in the program should be treated and respected as developing adults;
- Candidates should be presented with multiple theories and perspectives, and the strengths and weaknesses of each approach should be explored.

Several features support program consistency. Erikson provides prospective teachers with a consistent approach to assessment and a set of tools to use in the process. Also, all faculty teach in the program, which allows them to see how candidates are absorbing course material and how instruction can be adjusted to support learning.

- **Using professional teaching practices.**

Throughout the Erikson program, candidates engage in case-writing, action research, analyses of student learning, and performance assessment. These practices are aided by giving prospective teachers opportunities to reflect on their own experiences through reflective essays, autobiographical writing, and self-assessments. For instance, Erikson candidates are asked to identify some key characteristics of good learning experiences in their own histories and compare them with the experiences of others. This affords them the opportunity to understand that learning takes different forms for different individuals and that learning will vary across individuals. Beginning teachers are often better able to provide high-quality instruction after having an opportunity to reflect on their own experiences.

- **Emphasizing continuous renewal.**

Several features of the Erikson program provide avenues for program renewal. For example, each class syllabus has explicit key concepts that make course goals clear so that they can be shared and improved. Faculty members meet regularly to review and discuss courses, including how they can help candidates create a coherent whole out of the overall curriculum. These processes allow faculty to understand what issues are emerging in classes and teaching practice. As a result the Erikson program is a "moving target." Faculty estimate that course content changes 20 to 25 percent annually.

Conclusion

While there are strong programs that draw on the developmental sciences in educator preparation, the majority of teachers and other educators in PreK-12 schools are not being adequately prepared to use these principles and practices, which research demonstrates help improve student achievement.

NCATE convened an expert panel to develop policy recommendations for increasing the application of knowledge and principles in the developmental sciences in educator preparation programs. The Panel addresses the role that educator preparation programs and accreditation bodies should play in infusing a developmental focus throughout educator preparation.

The Panel recommends that educator preparation programs ensure that child and adolescent development is a fundamental part of that preparation, and that accreditation bodies and professional associations adopt standards for preparation programs that include candidates' mastery of child and adolescent development knowledge, along with evidence of effective application in the classroom.

In addition, the knowledge base of the developmental sciences crosses departmental boundaries within higher education, and often within schools of education. Using new advances in developmental sciences knowledge as the focus of inter- and intra-department and college collaboration could lead to new lines of research and advances in connections between teaching practice and student achievement. Such efforts could enrich not only the schools of education and the other university departments involved but contribute to the knowledge base of the profession as well. **Schools of education should initiate such collaborations with the support of academic vice presidents and provosts.**

The full text of the National Panel's recommendations to policymakers and educators is included in its final report, entitled *The Road Less Traveled: How the Developmental Sciences Can Prepare Educators to Improve Student Achievement* and in a companion paper entitled: *Increasing the Application of Developmental Sciences Knowledge in Educator Preparation: Policy and Practice Issues* by Robert C. Pianta, Randy Hitz, and Blake West, Washington, D.C.: National Council for Accreditation of Teacher Education, 2010.

***Note that all references for material in this document are contained in the full paper *Increasing the Application of Developmental Sciences Knowledge in Educator Preparation* by Jon Snyder and Ira Lit, Washington, D.C.: National Council for Accreditation of Teacher Education, 2010. The paper is available at www.ncate.org. Click on Publications.**

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