



education review // reseñas educativas

editors: gene v glass gustavo e. fischman melissa cast-brede

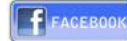
a multi-lingual journal of book reviews

December 23, 2011

ISSN 1094-5296

Education Review/Reseñas Educativas is a project of the National Education Policy Center <http://nepc.colorado.edu>

Follow *Education Review* on Facebook



Barbarin, Oscar & Wasik, Barbara (Eds.) (2009) *Handbook of Child Development and Early Education: Research to Practice*. NY: Guilford Press.

Pp. xv + 624

ISBN 978-1-60623-302-3

Reviewed by Shirley Kelly
Dewey Educational Group

The inaugural *Handbook of Child Development and Early Education: Research to Practice* fills the void for a compilation of empirically validated early learning classroom practices which take into account the individual needs of developing children. The scholarly collection is contained within 624 pages and twenty-six chapters. The chapters are grouped into six distinct but interrelated parts: (i) Development and Early Education, (ii) Brain Functioning and Learning, (iii) Social and Emotional Development, (iv) Language and Literacy, (v) Mathematics and Science and (vi) a concluding chapter. Although the chapters are interrelated, each one is self-contained with its own theoretical framework for understanding early learning and development from a socio-cognitive perspective.

Citation: Kelly, Shirley. (2011 December 23) Review of *Handbook of Child Development and Early Education: Research to Practice* by Barbarin, Oscar & Wasik, Barbara (Eds.). *Education Review*, 14. Retrieved [Date] from <http://www.edrev.info/reviews/rev1129.pdf>

The chapters are appropriately titled with clear headings and summaries for each section. A prospective reader can choose to read any chapter that captures his or her interest and grasp its contents without having to read any of the preceding chapters. Subject and author indices at the end of the handbook are a good way to locate topics of interest and the works of particular authors contained within the handbook. Hence, it makes a good literature review resource for researchers and graduate students in Child Development and Early Education.

The handbook was edited by Oscar Barbarin and Barbara Wasik who made a number of contributions to the handbook i.e., the introductory and the concluding chapters, a foreword to each part of the handbook, and a number of different chapters within the handbook. The collection of scholarly papers within the handbook is based on the contributions of 47 prominent scholars worldwide. The papers address key issues pertaining to Child Development, Child and Family Studies, Curriculum Development and Instruction; Developmental, Educational, and Instructional Psychology; Teaching and Learning; Math Policy Research; Preschool and Childcare Centers; Pure and Applied Mathematics; and Social Studies. The contributors reviewed a wide body of research within their respective fields and discuss the relevance of a variety of developmental research findings to school readiness, literacy, numeracy, science education, socio-emotional competence, pedagogy, assessment, professional development, teacher-education, academic standards, curriculum development, parental involvement, teacher-student relationships, and equity in accessing quality education during the early childhood years.

The breadth of the issues covered by the handbook makes it a valuable resource for child related professionals such as K-3 practitioners, reading specialists, developmental and educational psychologists, early education policy makers, early education faculty, researchers, and parents. Most of the concepts covered within each chapter are found in child development and early education textbooks. Hence, the handbook may be used as a supplementary text to help teacher-education students understand how research findings and the concepts they learn in their child development classes are applicable to teaching and learning during the early years.

I have used a number of chapters from Parts I, III, IV and V of the handbook as supplementary readings for undergraduate courses in Child Development, Human Development, and Educational Psychology. Students taking methods courses in Early Childhood Education, Elementary Education, Reading Education, Math Education, and Science Education will find valuable information about effective programs and instructional practices for their respective fields within the handbook. Suggestions for future research are contained within most of the chapters. Hence, graduate students and researchers seeking new directions for research in Child Development and Early Childhood Education would find the handbook a worthwhile read.

Piaget's constructivist theory and Vygotsky's socio-cultural theory are the prevailing frameworks for most of the chapters in the handbook. The rare usage of psychosocial theories to discuss socio-emotional competence in Part III of the handbook was a refreshing change to the mostly socio-cognitive framework. The omission of psychoanalytic and behavioral theories from most of the discourse was justifiable because they fall outside the realm of contemporary theories on early learning and child development.

Some critics may argue that the mostly socio-cognitive approach is a simplistic reductionist perspective which fails to take into account the complex nature of developing children. Bronfenbrenner's Systems Theory with its various layers of chronological systems may seem to be a more appropriate theoretical framework to deal with the complexities of developing children. However, when one realizes that a simple approach usually facilitates better understanding of complex problems and the formulation of solutions to those problems, the simpler socio-cognitive approach is deemed appropriate.

My jaunt through each of the chapters usually ended with me taking time out to reflect on the ideas, concepts, findings, and classroom practices presented within the chapter. I now share with you the most salient materials I encountered during my reading. Early learning reformers may find it valuable to take note of these highlights. They may prove useful in the design of programs that seek

funding under the \$21 billion the Obama Administration has earmarked for early education (Center on Children and Families at Brookings & the National Institute for Early Education Research, 2010).

The diverse target audience for the handbook, prompts me to write this review in a manner that can be easily understood by beginners and experts in the field of child development and early education. A chapter review for each part of the handbook begins below.

Part I. Development and Early Education

Oscar Barbarin and Kevin Miller make the case that current educational practices are not informed by recent discoveries in brain development, memory, early mathematical abilities, etc. in “Developmental Science and Early Education: An Introduction” (Chapter 1). They go on to discuss how findings from developmental research have the potential to transform instruction and enhance learning and achievement in all children. Barbarin and Miller pose over sixty thought-provoking questions which ought to be taken into consideration and addressed by early education reformers. The questions set the tone for the remaining chapters in the handbook and cover ten key areas in teaching and learning, i.e., academic standards, curricula, child development, capacity to learn, pedagogy, assessment, relationships, professional development, individual differences, and family involvement. A sample listing of the questions provides a quick overview of some of the issues addressed in the handbook:

- Q1. What key theoretical constructs and empirical findings from developmental science provide a basis for curriculum content and instructional strategies?
- Q2. What content areas may be taught across the span of the early childhood ages 3 – 8?
- Q3. What are the critical competencies to be mastered in the areas of language, literacy, numeracy, and socio-emotional development, and what are the developmental opportunities of mastery during the 3 to 8 year-old age span?
- Q4. What capabilities do children possess that enable them to acquire knowledge and skills related to literacy, mathematics, and science?

- Q5. What practices help all children develop the knowledge, skills, and confidence necessary to be active citizens in a diverse and democratic society?
- Q6. What are the purposes of assessment, and how can assessments be designed to attain their ends?
- Q7. How important are teacher-child relationships to academic achievement?
- Q8. What forms of support are needed to advance teachers' skills?
- Q9. What are the special competencies and limitations of English Language Learners, and how can they be addressed in curriculum and instruction?
- Q10. How do schools facilitate and/or sustain family participation across ethnic and economically diverse groups?

Sharon Ritchie, Kelly Maxwell, and Sue Bredekamp address aspects of questions 4, 5, and 7 in "Rethinking Early Schooling: Using Development Science to Transform Children's Early School Experiences" (Chapter 2). They argue that students' mastery of four developmental processes i.e., self-regulation, representation, memory, and attachment enhance their academic success during the P – 3 early years. Ritchie, Maxwell, and Bredekamp provide examples of classroom practices that foster the development of the four developmental processes. They also show how carefully designed early intervention programs can foster the development of self-regulation, representation, memory, and attachment in disadvantaged children who tend to enter school deficient in cognitive and socio-emotional skills.

In the last chapter of Part I, "Bridging Developmental Theory and Educational Practice: Lessons from the Vygotskian Project" (Chapter 3), Anna Stetsenko and Eduardo Vianna utilize a Vygotskian framework to reveal that learning is a dynamic process which (i) cultivates creativity, (ii) creates new knowledge as problems change, and (iii) fosters the development of self-regulation, representation, memory, and attachment when knowledge is transmitted as a cultural tool to solve every day problems. Brain research - discussed in Part II of the

handbook - sheds further light on the biological processes that are involved in acquiring new knowledge.

Part II. Brain Functioning and Learning

Cognitive neuroscience terminology is commonly used throughout the chapters in this section of the handbook. Hence, the average early childhood practitioner is likely to find this section a difficult read. This downside to the chapters in no way diminishes the value of their contents with respect to the early education reform movement. Maria Fusaro and Charles Nelson present a compelling argument about facilitating the learning process through the alignment of educational practices and the brain's natural propensity to develop specialized neural networks. They explain how specialized neural networks improve the efficiency and effectiveness of information processing in "Developmental Cognitive Neuroscience and Education Practice" (Chapter 4). For example, early learners of reading and math inefficiently activate many areas of their brains to perform math and reading tasks. When they became more skilled at such tasks, they perform them efficiently by utilizing specialized processes such as automaticity and recognition which activate few specialized areas in the brain. Specialization of the prefrontal cortex also facilitates the learning process by helping young learners to selectively attend to information and regulate their behavior. The authors suggest that further research in brain specialization and circuitry should take into account other variables such as experience, practice, and emotional processes.

Patricia Bauer expounded upon the brain processes involved in learning and memorization in chapter 5, "Neurodevelopmental Changes in Infancy and Beyond: Implications for Learning and Memory". Her treatise on memory validated claims made by Ritchie, Maxwell, and Bredekamp in chapter 2. According to Bauer, learning and memorization begins with information impinging on different unimodal sensory registers such as the eye (visual), skin (somatosensory), and ears (auditory). The information then becomes integrated in multimodal association areas within the parietal, prefrontal, and temporal lobes through a process that Cook & Cook (2009) refer to as cross modal perception. The integrated information undergoes further processing in the medial

temporal lobes where common elements between incoming new information and old information (already stored in the long term memory) are recognized and become linked together. Such linking of new information has the added benefits of reconsolidating previously learned information. However, it renders old information vulnerable to disruption, interference, and forgetting.

After consolidation, the recently processed information is stored in the unimodal and multimodal association areas where the information was first registered. Retrieval of the stored information occurs when an internal or external stimulus reactivates the circuitry – mainly in the prefrontal cortex - that first registered and processed the information. It is important to note that the neural structures involved in learning and memory are not well formed in young children. Hence, younger children have more limitations learning and memorizing new information than do older children. These limitations provide a plausible explanation as to why Cook and Cook (2009) claim that children have little or no memories before three years of age.

An understanding of how neural processes work in learning and memorization heightens one's awareness about the need for an integrated curriculum to maximize learning during the early years. The identification and recognition of common links between subject areas foster consolidation and reconsolidation of new and old information in related subject areas. Hence, an integrated curriculum has the potential to optimize brain processing efficiency and effectiveness. Future research may try to determine the optimal time lag between new and old information that strengthens the consolidation and reconsolidation processes and minimizes information overload, confusion, and extinction.

In “Learning to Remember” (Chapter 6), Peter Ornstein, Jennifer Coffman, and Jennie Grammer utilize social interaction theory and information processing theory to contextualize the memorization process. They showed that memory significantly improve when parents hold elaborative conversations with their children and teachers provide students with hints on how to solve tasks and recall information in Math and English. Children who were exposed to a curriculum with great demands on their memory exhibited better memory than children of the

same age who were not exposed to such an environment. The researchers express the need for experimental research that link teachers' use of memory related instruction to children's use of mnemonic strategies.

Marc Bornstein concludes Part II of the handbook with research that make an important contribution to the age-old debate about the fixed nature of IQ scores. In "The Mind of the Preschool Child: The Intelligence-School Interface" (Chapter 7), Bornstein cautions against using the results of IQ tests alone to predict any child's future academic success. IQ tests do not measure other important factors that contribute to a child's academic success i.e., determination, imagination, leadership, social understanding, personality motivation, interest etc. He promotes the idea that intelligence is not fixed at birth but can be improved with instruction. Bornstein calls for the use of a multiple intelligence framework to capitalize upon and develop each child's varying levels of competence across a domain of specific abilities. The challenge for educators and researchers is to determine what the domain of specific cognitive abilities should be; and how to develop multidimensional measures that would assess them validly and reliably. These uncertainties only provide fuel to proponents who argue that IQ scores should be based on verbal and mathematical skills that can be objectively measured in a valid and reliable manner. Is it worthwhile for researchers to try and establish a multidimensional measure that will assess the IQ of children validly and reliably? Would such a measure capture each child's specific abilities? Would such a measure identify the unique gifts of some children? There is no current resolution to the IQ debate. Hence, there is need for a cross-functional research team of philosophers, epistemologists, educational and developmental psychologists to address the myriad issues surrounding the IQ debate. The discussion shifts from the cognitive aspect of child development to the socio-emotional in Part III of the handbook.

Part III. Social and Emotional Development

There is considerable overlap between Parts I, II, and III. If you are pressed for time, chapter 8 “Development of Self, Relationships, and Socio-emotional Competence: Foundations for Early School Success” is a good place to start reading the handbook. The authors, Ross Thompson and Miranda Goodman, discuss aspects of self that promote academic success from the early years onwards. Self awareness, self-regulation, initiative in learning, social and emotional understanding, and empathy, caring, and perspective taking are touted as key academic success factors in the early years. Perspective taking is characteristic of children at the concrete operational stage, and individuals who exhibit genuine empathy and compassion operate at Kohlberg’s conventional and post-conventional levels. Hence the latter academic success factor seems to be more appropriate for older children. While reading the chapter 8, I was caught off guard when the authors associate cognitive psychologists Piaget and Kohlberg with behavioral concepts such as rewards and punishment, “For many years, guided by theories of Piaget and Kohlberg, researchers viewed young children as being motivated to cooperate by the rewards and punishments of adult authorities” (p. 158). Pavlov and Skinner would have been more appropriate choices than that of Piaget and Kohlberg. The last two sections of the chapter deal with the development of social interaction skills and good relationships between teachers, parents, and peers. Parents and teachers may find these two sections very helpful because learning is a social activity and equipping young children with excellent social skills will enhance their academic success.

The discussion about self regulation that began in chapter 2 continues in “Taming the Terrible Twos: Self Regulation and School Readiness” (Chapter 9). Susan Calkins and Amanda Williford expand the definition of self-regulation to show that it is comprised of 5 different types of regulation processes i.e., biological, attentional, emotional, behavioral, and cognitive. The processes exist in a hierarchical chain as shown in the order in which they are written. For example, a child who suffers a physiological impairment which prevents the development

of biological regulation process is unlikely to develop any of the subsequent regulation processes.

Calkins and Williford explain how teaching children specific strategies to handle negative emotions within positive, supportive environments promote the development of emotional, attentional, behavioral, and cognitive regulatory control. Empirical evidence indicates that students who are able to master the five hierarchical regulatory processes achieve higher levels of academic success during the P-3 school years than children who do not master them. The ensuing chapter revisits the earlier discussion about socio-emotional development and incorporates an aesthetic orientation which makes it a pleasant read.

Janet Thompson and Kelly Twibell provide a comprehensive curriculum on how teachers can promote socio-emotional development within the classroom. The authors claim that fostering socio-emotional development begins with carefully planning the physical environment, daily routines and activities, as well as positive interactions between teachers, students, and peers in “Teaching Hearts and Minds in Early Childhood Classroom” (Chapter 10). They recommend the use of calming colors to decorate the walls, use of soft child size furniture and pillows, minimal distractions, and smooth transitions between activities. Interaction with peers is the focus of the next chapter.

“Supporting Peer Relationships in Early Education” (Chapter 11) is a good primer for anyone interested in helping young children develop social skills competence. Social skills competence plays out in daily classroom interactions as part of the hidden curriculum and is often overlooked by teachers. Teachers are more concerned about teaching content areas that are assessed on high stakes standardized tests than skills that are not assessed on those tests. The authors Kathleen Gallagher and Patricia Sylvester provide recommendations on how to curb bullying at schools; and stress the importance of using squabbles between children as teachable moments to help children develop etiquette, negotiation skills, and conflict resolution skills. Research is needed to determine how teachers can effectively deliver the hidden curriculum in every day classroom interactions. The discussion about

social skills development continues I chapter 12 with a new twist.

Oscar Barbarin and Erica Odom address discrimination in a very enlightening and scholarly manner within “Promoting Social Acceptance and Respect for Cultural Diversity in Young children: Learning from Developmental Research” (chapter 12). The opening vignettes of the chapter show how young children practice discrimination against children they perceive as “different”. In their discussion of the subject matter, Barbarin and Odom present 25 intervention strategies that teachers can utilize in the classroom to promote the development of social acceptance and respect for diversity in young children. In light of the increasing diversity in schools, communities, and the workplace, one cannot underestimate the saliency of teaching such a skill set in addition to skills in Language, Math and Science.

IV. Language and Literacy

The discussion switches from the development of soft skills to the development of language, literacy, math, and science skills in the second half of the handbook. Parents and teachers will find “The Social Context of Language and Literacy Development” (Chapter 13) an enjoyable and informative read. Gordon Wells uses dialogue to clearly illustrate the importance social contexts play in the development of language skills in young children. He provides examples of the types of dialogue between mother and child that captivates the child’s interest, expand the child’s vocabulary, and helps the child link new information to old information already in his/her language schemata. Wells presents a concisely written 6-page summary on how teachers can design learning activities based on inquiry, dialogue, and collaboration to help students learn to value reading, writing, and talking. The discussion soon transitions to a more didactic approach to language and literacy development.

Barbara Wasik and Beth Newman propose a developmentally appropriate language and literacy model in “Teaching and Learning to Read” (Chapter 14). The model is comprised of a number of timelines for the initiation, completion, and ongoing development of important skills in language and literacy development i.e.,

oral language, vocabulary, concepts of print, oral comprehension, alphabet knowledge, phonological awareness, phonics, written comprehension, fluency, writing, and content knowledge. The model can be better aligned with the Piaget's theory of cognitive development in terms of alphabet knowledge, phonological skill development, and writing. It should be made clear that the purpose of writing during the early stages of preoperational thought is to develop fine motor skills because writing only becomes a communication tool for most children during the late stages of preoperational thought. Despite its drawbacks, the model provides a good basis to develop programmed reading curricula for children in the preoperational stages of development. There is concern that many ECE teachers lack the training needed to successfully adopt and implement such a reading model.

David Dickinson, Catherine Darrow, Sarah Ngo, and Lisa D'Souza highlight the need for professional development activities to provide teachers with the training they need to develop better instructional strategies to engage their students in enriched dialogue in the classroom. Their contribution to the handbook, "Changing Classroom Conversations: Narrowing the Gap between Potential and Reality" (Chapter 15), contains four research studies that outline how to design and deliver successful professional development activities that promote teacher effectiveness in the early years.

Chapter 16, "Young Latino Children's English Reading Development: Insights for Classroom Teachers", continues to focus on teachers as key agents of change in language and literacy development. The authors Steve Amendum and Jill Fitzgerald note there is no theory that links oral language development to literacy development in monolingual and bilingual students. Research by Kelly (2010) promises to show how oral language development and literacy development may be linked through Piaget's theory of cognitive development. The research attempts to link sound discrimination used in oral language development to the symbolic representations of letter graphemes in literacy development, which are then mapped onto words already in the language schemata of pre-operational children. Hence, it may be possible to link language and literacy development in a manner that helps

to explain the differences Amendum and Fitzgerald noted between English language learners (ELL's) and non-ELL students. ELL's differed from non-ELL's in their ability to represent sounds in words with a grapheme. Given the growing numbers of ELL's in early classrooms, educators may find the illustrated reading instruction principles provided in this chapter very helpful.

Part IV draws to a close with a discussion about a myriad of ways educators can embrace parents in the educational process. In "Supporting Parental Practices in the Language and Literacy Development of Young Children" (Chapter 17), Oscar Barbarin and Nikki Aikens discuss strategies schools and teachers may use to promote more parental involvement. Strategies include developing positive home school relationships; and hosting workshops, discussion groups, and parent cafes to educate parents about activities that will motivate their children to read and help them develop an appreciation for books. Such activities include buying books together, storytelling, visiting museums, and frequenting local libraries.

Part V. Mathematics and Science

This section of the handbook places a strong emphasis on what teachers can do to develop early math and science skills. Herbert Ginsburg espouses the idea that there needs to be a paradigm shift in Early Childhood Mathematics Education (ECME) in his introductory chapter to part five, "Early Mathematics Education and How to Do it" (Chapter 18). He promotes the idea of "Thinking Big" in a mathematically way. Thinking Big involves utilizing concepts such as number and operations, geometry, and algebra in children's every day play and classroom experiences versus the commonly used drill and practice methodologies. Ginsburg appears biased when he only discusses The Math for Little Kids curriculum and how teachers may implement it in the classroom. It would have been helpful if Ginsburg mentioned other early learning math programs. Ginsburg also fail to address the fundamental concept of subitizing (the ability of young children to recognize and discriminate small numbers of objects) that belies mathematical development in young children (Kaufman et al 1949).

Robert Siegler compensates for Ginsburg's myopia when he discusses the merits of board games and a variety of early math programs such as Number Worlds and Pre-K Mathematics in "Improving Preschoolers' Number Sense Using Information-Processing Theory" (Chapter 19). These early math programs are based on neo-piagetian, sociocultural, and information processing theories respectively. Empirical evidence indicates that these early math programs enhance number line estimation, number identification, numerical magnitude estimation, and counting skills in children from low and middle-income socio-economic status. The subsequent chapter makes a cognitive leap from low level math skills as Maria Bussi and Mara Boni takes on the concept of zero as a placeholder and an indicator of nothingness in "The Early Construction of Mathematical Meanings: Learning Positional Representation of Numbers" (Chapter 20). Bussi and Boni offer an insightful explanation as to why the dual nature of zero is more readily understood by children living in Asia than children living in America. Asian languages decompose numbers greater than 10 into their component parts which alludes to a base 10 numbering system. For example, sixteen becomes ten plus six, and twenty becomes two tens in Chinese, Japanese, and Korean. The English language does not decompose numbers greater than ten into their component parts so learning the placement value of zero can be presents a greater challenge and a source of mathematical misconception for English-speaking children than it does for Asian-speaking children. The authors recommend use of the Slavonic abacus, Spike Abacus and the Pascaline Zero + 1 to learn the placement value of zero and omits the use of more cost-effective simple everyday objects such as fingers, blocks, and raisins to accomplish the same objective. Overall, the chapter makes a valuable contribution to the knowledge base on how educators may prevent detrimental mathematical misconceptions in EME.

Another drawback to the chapter is that it is written in mathematical jargon that is beyond the average ECE teacher's training in math. The next chapter is more readable friendly to the average reader.

In "Applying Developmental Approaches to Learning Math" (Chapter 21), Beth Casey shows that students are highly likely to transfer their actively constructed knowledge about the dual meanings of the zero to other

base number systems. Casey cites research which shows that transference is achieved by preoperational children who are taught within enriched learning environments that provide focused background knowledge, experiential learning opportunities, expert guidance that is grounded in play. For example, storytelling sagas in the book series “Round the Rug Math: Adventures in Problem Solving” have been effectively used to develop spatial and mathematical thinking in children. Rosanna Falcade and Paolo Strozzi expand on the play theme to teach mathematical skills. They describe how children can develop a variety of mathematical and oral skills e.g. spatial reasoning, estimation, representation, interpretation, evaluation, and verbal communication skills through ‘hands on’ engagement in a Village Game within “Construction and Representation of Space in 5-Year-Old Children” (Chapter 22).

In the final chapter of the math section, Erik De Corte, Lieven Verschaffel, and Fien Depaepe provide a lively discussion about “Enhancing Mathematical Problem Solving in Primary School Children: Lessons from Design Experiments” (Chapter 23). The information presented in the chapter centers around teachers’ use of a variety of techniques such as metacognitive strategy instruction, scaffolding, task orientation, small group work, group work observation and facilitation, student articulation and reflection during group activities, and multimodal approaches to problem solving and generating solutions to enhance students’ problem solving skills. These strategies have been around for a while and are equally important in solving problems in science. Biehler & Snowman (1997) discuss these instructional strategies in their textbook on educational psychology.

In light of the current impetus to promote Science, Technology, and Math (STEM), it is disappointing to see only a few chapters dedicated to Math and Science in the handbook. Paradoxically it reflects the persistent small number of students that pursue Math and Science from high school onwards. It also highlights the need to allocate more resources to efforts that will attract more students into Math and Science studies at the secondary and post-secondary levels.

Early learning experiences seem to cause many students to perceive Math and Science as difficult subjects. Hence, many students avoid pursuing Math and Science courses once it becomes optional to do so. Stella Vosniadou presents a pedagogical technique to correct this phenomenon in “Science Education for Young Children” (Chapter 24). She makes the argument that science can be effectively taught (devoid of difficulty, low applicability, and misconceptions) if conceptual change is promoted in children. This can be achieved through carefully designed learning activities that create “cognitive incongruity” in children. Cognitive incongruity coupled with specific instruction to resolve it help children develop multiple perspectives and “advance to higher degrees of abstraction”. This pedagogical technique is based on cognitive processes such as assimilation, cognitive dissonance, accommodation, and scaffolding thus making it theoretically sound.

The penultimate chapter on “Improving Science Teaching for Young Children” (Chapter 25) brings center stage the discussion about a pressing need for the educational system to produce highly competent Math and Science graduates to secure America’s competitiveness within a global economy. Authors Mark Enfield and Dwight Rogers discuss the need for further research that will aid in the development of long-term, empirically sound, collaborative, and inquiry-oriented professional development programs that will adequately train and prepare ECE teacher to design and deliver effective science programs.

Part VI Conclusion

The concluding chapter by Samuel Odom, Oscar Barbarin, and Barbara Wasik present an integrative summary about the contributions developmental science has made to teaching and learning during the early years. The chapter may serve as a quick overview of the handbook for those who are pressed for time but want to appreciate the scope of the issues covered within the handbook.

References

- Biehler, R.F. & Snowman, J. S. (1997). *Psychology Applied to Teaching*, 8th edition, Boston, MA: Houghton Mifflin Co.
- CENTER on CHILDREN and FAMILIES on BROOKINGS & The NATIONAL INSTITUTE for EARLY EDUCATION RESEARCH (2010). *Investing in Young Children: New Directions in Federal Preschool and Early Childhood Policy*. Edited by Ron Haskins and W. Steven Barnett. Accessed October 16, 2010 at http://nieer.org/pdf/Investing_in_Young_Children.pdf
- Cook J., & Cook, G. (2009). *Child Development: Principles and Perspectives*, Boston MA: Pearson Education, Inc.
- Kaufman, E.L., Lord, M.W., Reese, T.W., & Volkman, J. (1949). ["The discrimination of visual number"](#). *The American Journal of Psychology*, 62 (4): pp. 498–525.
- Kelly, S. M. (July 2010). *Does the Initial Mapping of the Phonetic Alphabet on Established Schemata in Pre-operational Children Increase Literacy Fluency and Reduce the NAEP Grade 4 Literacy Failure Rates?* Paper presented at the University of Oxford Roundtable Session on Early Learning Psychology, Oxford, England. (Accepted for publication in the *Forum on Public Policy* at the University of Illinois).

About the Reviewer

Shirley Kelly holds a doctorate in Educational Psychology from Southern Illinois University at Carbondale. She taught courses in Educational Psychology, Human Development, Child Development, Measurement and Assessment, Management of Disruptive Classroom Behaviors, and Techniques of Research at the University of Wisconsin-Whitewater. She holds memberships in the American Psychological Association, the Society for Research in Child Development, the Mid-Western Educational Research Association, and the Association of Educational Researchers of Ontario. She has given presentations in



early learning at regional, national, and international conferences.

Copyright is retained by the first or sole author, who grants right of first publication to the *Education Review*.

Education Review/Reseñas Educativas is a project of the National Education Policy Center <http://nepc.colorado.edu>



Editors

Gene V Glass

glass@edrev.info

Gustavo Fischman

fischman@edrev.info

Melissa Cast-Brede

cast-brede@edrev.info
