

Early Childhood Education:
Developmental or Academic

David Elkind

"Children must master the language of things before they master the language of words" (Froebel)

In that one sentence, Frederick Froebel, father of the kindergarten, expressed the essence of early childhood education. Children are not knowing red and green, sweet and sour, rough and smooth, cold and hot, or any of the other myriad of physical sensations. The natural world is the infant and young child's first curriculum. And it can only be learned by direct interaction with things. There is no way a young child can learn the difference between sweet and sour, rough and smooth, hot and cold with tasting, touching or feeling something. Learning about the world of things, and all their various properties is a time consuming and effortful process that cannot be hurried.

This conception of the early childhood education has been echoed by all of the giants of early childhood, Froebel, Montessori, Steiner, and Piaget and Vygotsky. It is supported by developmental theory which demonstrates that the logical structure of reading and math require syllogistic reasoning abilities on the part of the child. And it is given weight by a number of longitudinal studies

that give evidence that the benefits of early childhood education are more social than they are intellectual. On the other hand, there is no solid research to demonstrate that early academic training is either better or worse than the more traditional hands-on, early education. Given this situation, it seems better to err on the side of caution and not engage in the formal academic training of young children.

The Giants of Early Childhood Education

The educators who have established early childhood as a legitimate age for guided learning, have also been quite explicit as to the nature of early instruction. They have all emphasized the importance of manipulative experiences for infants and young children and the dangers of their too early introduction to the world of symbols. Froebel, Montessori and Steiner all created rich, hands-on materials for children to explore and conceptualize. Each of them acknowledged, in his or her own way, that the capacity to discriminate precedes the capacity to label, and that the understanding of quality precedes that of quantity.

It would be wrong, however, to suggest that founders of age appropriate practice were of one mind. Froebel, for example, believed that his gifts, such as ball, square and diamond would teach young children abstract concepts of unity and harmony and not just

geometric shapes. Montessori argued that there were critical periods in development during which children had to exercise their sensorimotor abilities if these were to be fully realized. Unlike Froebel, who saw play as a valuable mode of learning for young children, Montessori saw it as frivolous, and argued that play should be the child's work.

Rudolf Steiner, founder of the Waldorf schools, was most concerned that education be holistic. In the Waldorf schools, handicraft, the arts and music are integral parts of the curriculum. Children, for example, write and illustrate their own texts. Whereas the materials introduced by Froebel and Montessori were autodidactic, and had children learning from their own individual activity, Steiner's activities were more socially and collaboratively oriented.

Piaget did not advocate a particular early educational program, but he did argue that children learn from their own spontaneous exploration of things, and from a reflective abstraction from those explorations. It was an indirect argument for the importance of manipulative materials in early childhood education. Vygotsky, in contrast, believed that children could only fully realize their abilities with the aid of guidance and modelling by adults. Vygotsky thus placed much greater emphasis upon the teacher's role than was

true for the other writers who entrusted much of the young child's learning to the child himself or herself.

Accordingly, while all of these giants of early childhood recognized the importance of manipulative materials, they were less in agreement as to the role of the teacher and the extent to which children could learn better through individual or group activity. There are also disagreements among contemporary early childhood educators as to the teacher's role and as to what constitutes the most effective curriculum for young children. What unites these workers, and what sets them apart from those who would make early childhood education a one size smaller first or second grade, is their commitment to building early childhood practice on the observations of young children. Put a bit differently, the giants of early childhood, and those who have followed after them, agree that education must start with the child, not with the subject matter to be taught.

The guiding principle of early childhood education is, then, the matching of curriculum and instruction to the child's developing abilities, needs and interests. This principle is broadly accepted, and advocated, by most early childhood educators. The National Association for the Education of Young Children has issued a policy statement entitled "Developmentally Appropriate Practice in Early

Childhood Programs." (Bredenkamp) This organization now evaluates and certifies early childhood programs that meet its criteria of developmental appropriateness.

The Logical Substructure of Reading and Math

Those who advocate early academic instruction, appear to make a fundamental error. They fail to recognize that there are different levels of math and reading attainment. Learning to name numbers and letters is far different from learning to do perform mathematical operations and to read with understanding. This is easy to demonstrate. We have had Sesame Street on TV for more than thirty years. Children today know their numbers and letters earlier than ever before. Many know them by age two. Yet children today are not learning math or reading any earlier or any better than did children before there was Sesame Street. Learning the names of numbers and letters is only the first step in the attainment of true numerical understanding and reading comprehension.

Take number as an illustration. There are three levels of numerical understanding, *nominal*, *ordinal* and *interval* which correspond to different forms of scaling. Nominal number is the use of number as a name, such as that on a baseball, football or basketball jersey. Children by the age of two or three can use number in the nominal sense. By the age of four or five, children can begin

to use ordinal number, they can order things according to quantitative differences. At this age children can arrange a series of size graded blocks, or sticks, from the smallest to the largest. Once the arrangement is complete, however, they are not able to insert a new, intermediate sized element, into the perceptual array.

It is only at six or seven, when children have attained what Piaget calls concrete operations, that children can construct a concept of a unit the basis for the understanding of interval number. Mathematical operations can only be performed on numbers that represent equal intervals, or units. For example, the scores given ice skaters are ranks and do not correspond to units. A skater who gets a 6 is not twice as good as a skater who gets a 3. It is only when a child attains a unit concept, the understanding that one and the same element is both like(cardinal number) and different(ordinal) number that he or she has a true understanding of number and can perform arithmetic operations. A true number concept presupposes that the child grasps that every number, say three, is both like every other number in that it is a number, but different from it in its order of enumeration.

The interval concept of number is an intellectual construction. It builds upon the child's experiences of both classifying and seriating concrete materials. Classification helps the child to

understand quantitative sameness, while seriation helps him or her appreciate quantitative difference. At a certain point, and with the aid of concrete operations, the child is able to bring these two concepts, of quantitative sameness and difference, together into the higher order concept of a unit which brings together the ideas of sameness and difference. Learning the names of numbers, and rote counting, is less important in this attainment than is practice in classifying and seriating many different materials.

A similar analysis can be made with respect to reading even though it is in some respects a more complex process in that it involves auditory and visual discrimination as well as cognitive construction. Nonetheless, the principle is the same. The earliest level of reading is the recognition of sight words. A child two or three year old may learn "stop" and "go" in part by the perceptual configuration and in part by the colors associated with these words. Sight words are like nominal numbers, they reflect a very early level of reading achievement. A second level of reading is phonetic and corresponds roughly to ordinal number. Children at four or five can learn the sounds for single letters and are able to read words like hat, cat sat and so on.

The very same child who can read phonetically, however, may not

be able to read phonemically. To read phonemically the child must be able to recognize that one and the same letter can be pronounced differently depending upon the context. A child who can read; hat, cat, sat, may still have trouble with ate, gate, and late. Likewise a child who may know "pin" may have trouble with "spin." To read phonemically, children must appreciate that one and the same letter can be pronounced in different ways. Here again, concrete operations are required for this highest level of reading.

The problem, then, of most early childhood academic instruction is the failure to appreciate that math and reading are complex skills that are acquired in stages that are related to age. Equally important is the appreciation that young children's intellectual abilities mature at different rates and that chronological age is not a good measure of cognitive ability. It is important, therefore, not to confuse early stages of math and reading, knowing number and letter names, with the later stages which require logical abilities that enable the child to appreciate that one and the number is both like and different than any other and that one and the same letter can be sounded differently depending on its' context. Children will acquire these skills more easily and more soundly, if they are taught in accordance with the developmental sequence that parallels the child's cognitive development.

The Research Base

At the outset, it must be admitted that hard data on the efficacy of one or another type of early childhood education program is hard to come by. The difficulty stems from the fact that education is a chaotic process. Every time a class meets the children and teacher are different thanks to the intervening experiences each one has had. Put differently, every classroom meeting is a non-replicable experiment. Our research tools, however, are borrowed from the physical sciences where regularity, rather than chaos, reigns. In physics and chemistry it is possible to control most, if not all of the variables in play. In education, this is almost impossible.

Comparisons between classrooms following different educational philosophies will nonetheless vary in many other ways as well. The teachers may vary in skill and experience as well as in personality. And it is almost impossible to match two groups of children. A reliable match would have to have comparable families which is difficult if not impossible. The instruments used for assessment, whether observations or tests, are less reliable and valid at the early childhood levels than they will be later. This does not mean that meaningful research cannot, or has not been done, it just means that we may have to be more innovative in designing educational studies than we have

been. The physical science paradigm, that presupposes regularity and replicability, is simply not appropriate to the study of classrooms.

Despite the difficulties, longitudinal studies of educational outcomes provide some of our most meaningful evidence of educational effects. If consistent effects are found over long periods of time, and despite all the variables in play, this suggest a hardy outcome. A number of longitudinal investigations of early childhood programs, for children living in poverty and at risk for school failure, have been reported. In summarizing ten of these studies Schweinhart et al, conclude that:

"Each of the studies that collected data on early childhood intellectual performance found its program group to have a significantly higher mean intellectual performance score than its non-program group at least during the program and shortly thereafter."

In some but not all of the studies, significantly fewer of the children in the program group than in the non-program group were placed in special classes. In some, but not all, of the studies more program than non-program children finished high school.

These early intervention studies give clear evidence that early childhood education, in most cases of the developmentally appropriate kind, had lasting effects upon the lives of the children who

participated. It is not clear, however, whether similar results would be attained had advantaged children been the subjects. Consider an analogy. If you take children who are significantly below the norm and feed them a full calorie nutritious diet, they will make remarkable progress until they reach the norm. On the other hand, if you put well nourished children on a similar regime, there will be few if any effects. It is a base rate issue. If you start a low base rate you have more room for room for improvement than if you start at the norm.

Studies of non-poverty children in different types of preschool are simply not definitive, but suggestive. One study by Hirsh Pasek and Cone compared the children who had attended an academic preschool with those who had attended a developmentally appropriate program. Although there were no academic differences between the groups, the children attending the academic program were more anxious and had lower self esteem. These result attenuated after the children began to attend public school. An older study, was carried out by Carelton Washburn, the famed Evanston Illinois educator. He had different classes of children introduced to reading at different grade levels from kindergarten to second grade.

The children who were introduced to reading at these three levels were then retested when they were in junior high school.

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They were assessed by raters who did not know at what grade level reading instruction had commenced. What Washburn found was there was little difference between the level of reading achievement among the groups. The children who had been introduced to reading late, however, were more motivated and spontaneous readers than those who had begun early. Similar findings were reported in the Plowden Report in England which compared children from the informal schools of rural areas with children who attended the more formal schools of urban centers.

Studies of early readers, those who are able to read phonemically on entering kindergarten, give similar results. In both the United States and Canada, only about 3 to 5 percent of children read early. In our studies of such children we found that most of them had IQ's of 120 or better and were at Piaget's stage of concrete operations. In addition, almost all of them had had a parent or relative who took a special interest in them. These adults read to them, took them to the library and talked about books with them. In order to learn to read, children need the requisite mental abilities, but they also benefit from the motivation that comes the special attention of a warm and caring adult.

The final evidence attesting to the importance of developmentally appropriate education at the early years comes from

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cross cultural studies. Bruner reports that in French Switzerland where reading instruction is begun at the preschool level, there is a large percentage of children with reading problems. In German Switzerland, where reading is not taught until ages six or seven, there are few reading problems. In Denmark, where reading is taught late there is almost no illiteracy. In Russia too, reading is not taught until the age of six or seven. The benefits of early academic instruction is thus not supported by cross cultural data.

Current Practice

Although, given the data above, it would be hard to make a case for early academic instruction, the demands upon early childhood educators to engage in such practices is growing. All too many kindergarten teachers are being pressured to teach their children numbers and letters and to administer standardized tests. In some kindergartens, children are even given homework in addition to the work sheets they must fill out during class time. In a developmentally appropriate classroom, in contrast, children are busy taking care of plants and animals, experimenting with sand and water, drawing and painting, listening to songs and stories and engaging in dramatic play. It is hard to believe that children learn more from worksheets than they do from engaging in these age appropriate activities.

Why, in the face of our knowledge about what is good education for young children, do we persist in miseducating children, in putting them at risk for no purpose? The short answer is that early childhood education is not about young children. It is about parents anxious to give their children an edge in what they regard as an increasingly competitive and global economy. It is about the motivation draining poverty that keeps so many children from learning in a socially foreign, middle-class, environment. It is the politicians who advocate accountability, standards and testing to win votes as much or more than to improve the schools. And it is about the miserable salaries and consequent high turnover that is the rule among early childhood workers.

While bypassing what we know is good pedagogy for children is deplorable at any step in the educational ladder it is particularly pernicious at the early childhood level. It is during the early years, ages 4-7, when children's basic attitudes towards themselves as students, towards learning and towards school are established. A child who comes through this period feeling good about himself or herself as a learner, enjoying learning and liking school, will have a lasting appetite for the acquisition of skills and knowledge. In contrast, a child who leaves these formative years; feeling badly about himself or herself as a learner, with an aversion to learning

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and a dislike of school, will never fully realize his or her latent abilities and talents.

If we want all of our children to be the best that they can be then we have recognize that education is about them,not about us. When we do that we will give young children and their parents, the developmentally appropriate, quality, affordable and accessible early childhood education they both need and deserve.