

Creating Brain-Efficient Curriculum

An analysis of the changes necessary to create a methodology and curriculum that enhances student achievement in reading, spelling and writing.

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The last decade and a half have been very challenging, as educators have literally battled over which educational philosophy teaches children most effectively. Is it whole language? Is it phonemic awareness and systematic, direct phonics instruction? Is it possible to conjoin the positive aspects of whole language into a systematic and direct phonics curriculum?

Why has this battle occurred when all sides have a genuine desire to teach children and help them to reach their highest potential? In order to fully understand, we must analyze the issues carefully.

It began with this premise: children have a language base developing since birth; thus, reading should be predicated on a child's natural language usage. Therefore, reading books that do not sound like the natural language of a child should be avoided. (Good-bye basals, hello literature.) As children are involved in print-rich literature, they will automatically pick up the phonemic patterns of speech, so phonemic awareness and phonics do not need to be taught directly or systematically. (Good-bye phonics, hello sight vocabulary.) In connection with this, if children are listening to print-rich literature and are writing authentic student text, they will naturally pick up the spelling patterns in the written word. (Good-bye systematic spelling instruction, hello high frequency words.)

The only thing that was forgotten in this decade of "natural education" was the child's brain and how it processes information. It does not like random information and stores it poorly.

The educational field seems to allow more pendulum swings than any other profession. Perhaps it is our constant search for new teaching ideas that leads us to drop one teaching method or program to follow another. With the whole language movement, we have virtually thrown the baby out with the bath,

rather than artfully gleaning the important aspects of whole language to combine it with direct and systematic phonics instruction. (Yes, it can be done. Besides, whole language really wasn't "whole" without phonics.) You don't negate a child's language base and self-discovery because you've emphasized and taught a specific phoneme in your lesson plans.

The whole language movement *has* had a positive impact on several areas in curriculum development. It forced us to become more imaginative as teachers, to integrate the curriculum (tying math, science, and the arts together with reading, spelling, and writing). Providing children with authentic reading and writing opportunities, rather than doing insignificant "busy" work, is essential. It also helped us to move away from inane little stories so often found in basals and, instead, brought wonderful books rich with vocabulary artwork into the children's experiences.

It is upon this positive foundation that we must build excellent curriculum and teaching strategies. Jeanne Chall (1992/1993) said it so well:

"Both the direct instruction and whole language models are concerned with enhancing student achievement in reading. Both are equally concerned that the students develop a love of reading. Both want children to read good literature as well as expository texts. Both combine reading and writing. Both want all students to achieve their potential, and both want to reduce the number of students who fail. While language proponents tend to view learning to read as a natural process, developing in ways similar to language. Therefore, like language, most whole language proponents say it is not necessary to teach reading directly. Direct instruction models, on the other hand, view reading as needing to be taught, and taught systematically. Indeed, an often used rationale for the need to teach reading is that all people on earth speak a language while, according to UNESCO, nearly a billion are illiterate,

mainly because they do not attend schools where reading is taught and learned” (p. 8).

This is where we need to start:

1. We, as teachers, must take back our profession from outside forces that too often dictate to us. We are educational experts and know (or should know) how children learn best. If something does not feel right, we must be strong enough in our convictions and training to speak up. Never again should teachers see themselves as only facilitators or implementers! We are always going to have researchers or other educational “experts” or agencies tell us how children learn best. We need to be so well educated and experienced that we can listen to and read their views, then evaluate for ourselves what is best for children.

Research (Chall, 1967) shows us again and again that the teacher is a major variable in how well a child learns to read and spell. We must fully research the premises behind each educational philosophy, and cognitively assess the long-term effects it will have on students’ academic progress.

2. Our schools must adopt methods and strategies that handily teach children how to read and spell through a curriculum that presents the richness of literature, creative and informative writing, critical thinking and phonetic analysis at the same time. There must be harmony and continuity of thought in the realm of education (including administration, researchers, professors, classroom teachers, state and federal departments of education, and educational agencies) in order for changes to be implemented at all levels of the school system. Otherwise, millions of dollars will continue to be wasted as we jump from one program to another, discarding educational materials and taxpayers dollars needlessly.

You know textbook publishers don’t know everything. *You* must know how children learn so you can modify the curriculum to meet the needs of the children in your classroom.

Recent research (and not so recent research) empirically proves that both phonemic awareness and direct and systematic phonics instruction is necessary for literacy.¹

3. We must train teachers to become reading and spelling instruction experts. College requirements must be restructured, adding many specific classes in both these areas. They need to learn how to teach children phonemic awareness and phonetic skills to decode and encode text with books that are readable, in addition to exposing them to the joy and enrichment of fine literature. Teachers must learn the various sounds of every grapheme/phoneme in the English language in order to teach it, as well as how to tie it into the reading, spelling, and writing curriculum.
 - a. Teachers must understand the nature of language acquisition. Children are in a language acquisition mode both before and after birth, and language development is crucial to their reading, spelling, and writing success. Speaking to them, asking and answering questions, and reading to them is essential to their future literacy. So important are hearing and perception in this endeavor that if language is delayed, so is literacy.

Matching letters and letter combinations to speech sounds is essential! Guessing what the words are and struggling to find meaning within context is not an efficient way to read. Give them the phonetic code to the language. The sounds that they have heard from birth can be decoded and written down to be read later (encoding).

- b. Teachers must be taught how to reach EVERY child in the classroom, not allowing any child to slip through the cracks. All teachers must have the tools, materials (and budgets), strategies and training similar to special education training. We no longer have the option of homogeneous classrooms. Our classrooms are cultural, social, economic and academic melting pots, especially with more and more full-inclusion taking place. Our teachers must be highly skilled in pacing the academic workload and creating lesson plans that reach 100% of the children, regardless of language or ability.

¹ Blachman, 1991; Juel, 1991; Stanovich, 1986; Wagner, et al, 1994; Calfee, Lindamood & Lindamood, 1973)

- c. Teachers need to fully understand how a child's brain functions. From birth to around seven or eight years of age, a child must approach text using right hemisphere strategies. Research (Fleming & Stern, (1986) found that, "The principal components of the potentials, while analyzed in relation to a number of independent variables, revealed significant associations between reading proficiency and right hemispheric activity at early ages, to shift to significant associations between proficiency and left hemispheric activity at later ages." (p. 355). Based on this research, we must reach young learners through methods that easily teach the concepts needed for literacy.

Traditional approaches passed down from generation to generation have often, unwittingly, put up educational roadblocks for the child because of their abstract nature. Since the alphabet is made up of symbols which are abstract and left-brained, how do we reconcile this with three, four, five and six-year-olds whose brains are not yet ready for assimilating this type of information? To make matters worse, we expect a kindergarten child to not only know the letter names (A, B, C), but we expect them to recognize them by sight, *and* know the sounds they make (/a/, /b/, /c/). We expect them to know their upper and lowercase counterparts, (A, a). The sounds of the letter names are significantly different than the letter sounds. The shapes are often distinctly different. Now multiply all that times 26 letters and you have 104 different pieces of information! This may cause overload for many of our children, especially those with special needs or those who do not speak English as their native tongue.

Children need to learn through concrete concepts and patterns. Their brains are not ready for abstractions. David B. Bronson says this, "Quite apart from anything else the teacher does, the student, being human, is a pattern finder

and a pattern maker..." Frank B. May says, "It is wise for a teacher to take advantage of the natural inclination to seek patterns when teaching reading."²

4. We must commit to the education of pre-school children. Research clearly states that very young children (pre-preschoolers...) have a tremendous capacity for learning, if the information is presented properly.³ Continuity is needed with feeder pre-schools, Early Start, Head Start and primary classes in the public school system throughout the United States. We can do this by encouraging feeder pre-schools and Head Start Programs to tie into the local school district curriculum and to participate in staff and curriculum development. In the long run there would be fewer children in special education and federal and state funded categorical programs. (However, the curriculum must be designed to reach the very young and those with minimal parental interaction.)
5. We must help parents learn how to work both playfully and non-stressfully with their children, preparing them successfully for the school experience. If pre-school children enter kindergarten with essential pre-reading, spelling and writing skills, the kindergarten teacher can then continue extending their literacy skills.

Some Problems with the Traditional Approach to Teaching the Alphabet:

1. Too much alphabetic information is given at one time: When we say to the child, "This is a capital 'A,' this is the lower case 'a,' the letter name is 'a' and the usual sound it makes is 'a,'" the child becomes confused and does not fully understand, because the information holds little, if any, meaning. Now multiply these tasks by the 26 letters of the alphabet, and the child becomes overwhelmed.

Marilyn Jaeger Adams says this, "With respect to teaching uppercase and lowercase letters, current learning theory holds only one suggestion...teachers should not try to teach both versions of all twenty-six letters at the same time. To try simultaneously to teach two visually distinct forms with identical responses amid fifty other confusable forms with confusable sounds and labels [letter names] will almost guarantee learning difficulties."⁴

² Reading as Communication, Frank B. May, Merrill Publishing Co., 1990, page 221.

³ Anderson, Hiebert, Scott, and Wilkinson, 1985

⁴ "Beginning to Read, thinking and Learning about Print, p 67, Marilyn Jaeger Adams

2. Children are expected to learn from abstractions: We give children abstract symbols which they must understand and relate to a specific sound in order to read and spell. Additional obstacles are found with similar letter shapes: show a child a “b” and a “d.” Can you imagine visually distinguishing this at four, five and six years old? Try these: “p” and “q.” Or, try to distinguish auditorily the difference between the sounds of “e” and “i.”
3. The Alphabet is Fragmented: Various language arts programs have fragmented the alphabet, either by teaching a letter a week or mixing up the letters, and only teaching a small group of letters at a time. The rationale is that if we learn certain letters at the same time, we can then build certain words with those letters. There are two problems that we see with these teaching methods. 1) Children do not see the alphabet as a whole entity. Unless they see the complete alphabetic picture, they will not understand its purpose. If they do not understand, they cannot utilize the information in reading or writing. 2) With a program designed with the academic needs of children in mind, you do not have to fragment the alphabet. You can teach the alphabet all at one time, *allowing children to use all the letters of the alphabet for reading, spelling and writing right away!*

There is no excuse to take the whole kindergarten year to teach the alphabet. If your kindergarten students aren't reading, spelling and writing simple sentences by mid-year or early springtime, please re-evaluate the program that you are presently using.

Some Solutions to These Dilemmas:

Commit to a curriculum that provides strategies that present the alphabet and the information of words with a *brain-efficient*, right hemispheric method.

1. First, teach the sounds and shapes of the entire alphabet in the daily presentation, postponing letter names and capital letters. Traditionally the alphabet is presented by showing a letter a week to kindergartners, it being divided into 26 weeks. When the alphabet is fragmented in this way, the brain cannot perceive a whole picture. What, then,

happens to the child who is out with the chicken pox for two weeks (two letters unlearned), or a cold or the flu? How is his/her understanding of the alphabet affected?

According to many researchers (Adams, 1990), knowing *the letter names is the best predictor of beginning reading achievement*. I would like to propose again, in the interest of brain-efficient teaching, that we treat the letter names as secondary in importance to learning the sounds of the letters. Since we do not read with them, letter names provide no useful purpose for the early reader. Therefore, it should follow that the sounds need to be taught first. *Example*: A child raises a hand to ask the teacher how to spell the word cat. The teacher responds, verbally, with the letter names: “c-a-t.” The “c” in the verbal spelling does not sound like the hard sound of “c” in this word. The “a” in the spelling does not sound like the “a” in the word cat, and the “t” doesn't sound exactly like the pronounced “t.” Rather than hit the bull's eye, we have just created an educational roadblock. We have just missed a great educational moment. The above quote would better read, “Knowing the sounds of the letters is the best predictor of beginning reading achievement.” (Zoo-phonics has been saying this for 17 years!)

The National Reading Panel makes it clear that “teaching children to manipulate phonemes using letters produced bigger effects than teaching without letters.”⁵ This is a big issue, as many educators are promoting phonemic awareness as a precursor to learning the alphabet.

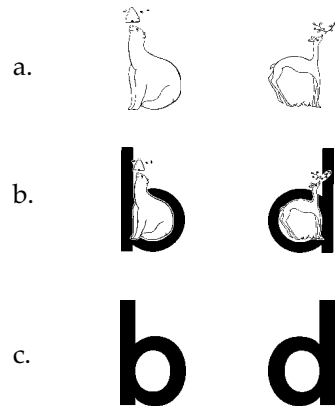
2. Teach lowercase letters first. We have been taught, societally, that teaching the uppercase letters first to the child is proper. (Look at toddler toys, baby bottles, and articles of clothing...all capital letters!) We have justified it by saying it is easier for a child to form an uppercase letter than it is to form a lower case letter. This is just not so. Some capital letters, (E for instance), take more pencil strokes to form it than its lowercase counterpart. Each time a young writer has to pick up a pencil to locate another point on the letter for formation, the child loses his or her place. There are more pencil pick-ups with uppercase letters than lowercase letters. The reasons for teaching lowercase letters first are these:
 - a. Books are written with lowercase letters 95% of the time. When Mom or Dad is reading *The Napping House*,⁶ for example, with her child

⁵ National Reading Panel's Report, “Teaching Children to Read” (April 2000)

⁶ The Napping House by Audrey Woods. Harcourt, Brace, NY

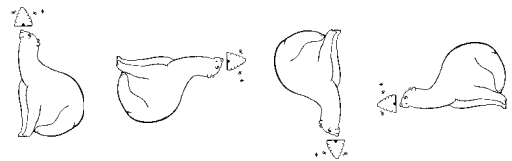
snuggled in her or his lap, the words are formed with letters in lowercase form. If the child has been taught the capital letters first, the child is denied the opportunity of fully participating in the text. However, if the child has been taught the *sounds and shapes of the lowercase letters*, then she/he can recognize most of the letters while mom or dad is reading. The opportunity to fully participate gives him/her the confidence to explore text in other areas.

- b. First and second grade teachers have to spend much of their time breaking the children's habit of writing with capital letters. *We need to teach them correctly the first time around!*
 - c. It is desired that children not only exit kindergarten with a full understanding of the sounds and shapes of the alphabet, but have capital letter and letter name mastery as well. Our premise is, "Build the essential foundation of sounds/shapes first, and then add the ancillary concepts such as capital letters and letter names," and they will understand all!
3. Use Mnemonics for Memory. "Because there is nothing inherent in the visual symbol that suggests its name or sound, one must develop that "something" that causes the child to make the letter/sound connections."⁷ If a teacher uses pictures that relate to the sounds of the letters and uses the child's modalities to learn and remember the sounds, these techniques will provide a safety net for the memory and retrieval. Without these connections there will be no understanding. Without understanding, there is no retention, usage or transference. Here is an example of right hemispheric, brain-efficient sequential teaching using pictorial mnemonics:

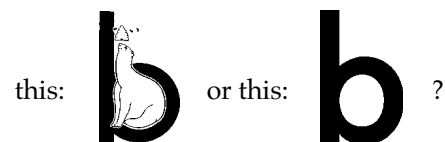


These examples represent the transition from picture (a mnemonic), to picture/letter (still maintaining its mnemonic, concrete quality), transitioning to the abstract letter, which, in good time, is our end result. To re-state: a) this presentation of the alphabet begins with a right hemispheric presentation through the picture; b) keeps its right hemisphere presentation as it makes its transition to the abstract, (seen by the picture placed on top of the letter); c) and then fully and successfully moves to a left hemispheric task, which is the letter.

Zoo-phonics uses Animals to teach. Here's why. A "b" can look like a "d." Turn it upside down. Now it can look like a "g," a "p," or a "q." But a bear is a bear, is a bear, no matter which way you turn it.⁸



Which is easier to remember for a five-year-old:



The visual impact of the picture of the bear, with its alliterative name (lubba bear) easily demonstrates the /b/ sound, cements the sound to the letter. Presenting letters in their abstract forms to young children delays memory, understanding and usage. Presenting the alphabet in a brain-efficient manner produces utilization because there is understanding.

⁷ Ehri, Deffner, & Wilce, 1984

⁸ Katy Phillips, Resource Specialist, Zoo-phonics Trainer of Teachers

*“Many other studies confirm that paired-associate learning in children is much improved when learners create or are provided with concrete, meaningful, interactive and imaginable connectives that link the stimulus and response terms in memory.”*⁹ But, this is not all. Marilyn Jaeger Adams supports this finding: *“...whenever letter sound instruction is begun, research endorses the use of letter/key-word/picture displays... Such displays provide useful mnemonic support and present an integrated reminder of the letters’ shape and sound at once.”*¹⁰

4. Attach a motor movement, (also a mnemonic, right brain stimulus), which is directly related to the picture/letter, establishing the sounds to the letters. The brain uses this device to cement the information into memory, and then uses the same device to retrieve the information from the brain when needed for reading and spelling activities.

Let’s go back to the bear: A child looks at the picture of the bear and associatively “sees” the shape, which is in the shape of the letter, (unbeknownst to the child as yet). The child is then taught a body gesture by having him use his hand to reach into the air like a bear “paw” reaching for honey from the hive and bringing it to the mouth. Specifically the child reaches up with his hand, pulls the hand down to his mouth as if eating honey, and says /b/. At this point all modalities (eyes, ears, mouth and limbs) have been involved in the beginning reading and spelling process. It’s commonly believed that when you hear something, you retain 10% of the information. If you see it and hear it, you retain 30%. If you see it, hear it and say it, you retain 40%. But, if you hear, see, say and DO it, (participate with the information), you retain 70-100% of the information. Teachers need to use a multi-modal approach to teach the reading and writing process, capitalizing on children’s natural tendency to wiggle. By using pictures in place of abstract symbols, the brain is better able to retain the information within the memory bank. A body signal done simultaneously with the visual aide stimulates the muscles, nervous system and both hemispheres of the brain. The body movement becomes internal and automatic, cueing the brain to uti-

lize the information recorded visually, auditorily and kinesthetically.

In a short time, after all the body gestures (signals to the brain) and sounds have been mastered, the teacher presents the picture of an animal placed on top of a letter. The child now accepts the idea that the animal is in the shape of a letter, and that every time that child sees that animal/letter, s/he makes the “buh” sound. It will not be long before the child, seeing just the letter in text, will be able to make the sound as s/he does the body movement or signal.

Learning the initial alphabet sounds in this fashion will take a matter of days or a few weeks as opposed to 26 weeks. By teaching the alphabet as a complete entity with every presentation, the child will become aware of how words are made. They will notice the letters in various textual forms (books, cereal boxes, road signs, headlines, etc.).

Research supports this methodology: “Rohwer (1966) investigated various kinds of associative mnemonics in young children and found that the best connectives for remembering words were meaningful ‘actor-action-object’ relationships.”¹¹ Further research (Fleming & Stern, 1986) supports this. *“The tactile-receptive systems of the hands provide for another access to the hemispheres . . . The consistent results of the various investigations may warrant recommendation that the right hemisphere . . . should be directly stimulated in order to improve (student’s) accuracy and efficiency in reading and spelling”* (p. 358).

5. Teach spelling as a vital part of the school curriculum. Because spelling/writing are a watermark of success, writing and spelling are the factors that separate the person from higher education or the profession of choice. A person may have all the talent, intelligence and/or creativity in the world, but without mastery of written language, this person is not able to accomplish his/her goals.
 - a. *Spelling can no longer be treated as an incidental activity. Many teachers have expressed in the recent past that they don’t teach spelling in a systematic fashion. Often word lists (if given at all) are sent home for study rather than be taught in the classroom.*
 - b. *Word families, rather than high frequency words, should be taught to kindergarten, first and second graders. Think about a first grade child trying*

⁹ Ehri, Deffner, Wilce, 1984, p. 881

¹⁰ “Beginning to Read, thinking and Learning about Print, p 67, Marilyn Jaeger Adams

¹¹ Ehri, Deffner, & Wilce, 1984, p. 881

to master words such as, “of,” “said,” “there,” “was,” “because,” etc., in one week’s spelling lesson. Teaching random information (abstract and left-brained) makes it difficult for students to assimilate this type of information for future use. Many can memorize a list for the spelling test on Friday, but on Monday there is little transference when writing in journals. There is no meaning or connection. Research (May 1990) states that children are pattern seekers and pattern makers. After the child has mastered the alphabet and can identify the sounds in the text, the next logical step is to combine the letters (still in the picture/letter form for right hemispheric strategies) to form words. If the children see the pattern (remember that it will be introduced with the pictures and placed into memory with a body signal), memory will take place more easily.

It is crucial that children understand the purpose behind the phonemic analysis being presented. The teacher must tie the “a-z’s” into all text (tying initial, medial, and ending sounds into literature, other textual experiences and classroom environment); and when broadening reading and writing skills, the teacher should tie the phonemes into the literature and other text.

- c. *Spelling must be taught as a systematic, consistent and integrated part of the reading curriculum.* Direct phonemic connections should be made through decodable text and literature used in the daily classroom lessons. Children then need to write daily to utilize these newly learned skills.
6. Reading and spelling errors must no longer go uncorrected. Teachers should allow room for young writers to write without fear of making mistakes. Inventive spelling was encouraged for this very reason, and the results have been positive in that students are writing more freely. Many interpreted it to mean that spelling need not be corrected or taught. But if spelling is taught, high frequency words have often been used as spelling lists. The brain does not easily store such random information. The same philosophy reigned in reading. Some believe that when a child is reading, h/she should not be interrupted

by the teacher correcting “miscues.” We believe, however, that if the child continues to repeat the same reading over and over, it becomes a part of his or her memory. We must remember how the child’s brain stores information. Mistakes left uncorrected are remembered.

Children need to read books that they can actually **read!** Decodable text, with repeated phonemic patterns is necessary so children can practice independent reading and reinforcement of skills. First and second graders must have reading books they can read independently. Ask any first grade teacher and s/he will tell you that their emerging readers are not able to learn how to read from literature books. The text is too difficult and unpredictable. These students need readers so that they can experience successful independent reading. It is necessary for students to be taught decoding so that they are able to sound out unfamiliar words that may already be in their oral vocabulary.

Wonderful literature must be a part of the daily classroom experience, not only for oral language and critical thinking skills development, but to support phonemic lessons. Those pages are FILLED with graphemes/phonemes to be learned!

Everything we do in teaching the child, from preschool through third grade, has to be taught with efficiency. What is it costing the child and teacher in time? In frustration? In success? In failure? If I teach a lesson that is abstract and unobtainable to the brain for understanding, retention, mastery and transference, then I have just wasted everybody’s time, especially the child’s.

Every child must become a reader. Having been in the classroom for 20 years (in the educational field for 31 years) has given me the confidence to state that teaching children how to read and write is within our grasp.

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