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Teaching Reading With Adults

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Abstract

In Canada, New Zealand, the United Kingdom and the United States renewed interest is being given to the teaching of literacy, especially reading, to adults using research-based information. This paper discusses literacy as the mastery of graphics technology. Topics include The Power of Permanent Thought, Information Processing in Space, and The Guiding Light. Each topic is developed to show how the basic elements of the graphic medium - its relative permanence, its ability to be arrayed in space, and its use of the properties of light - work together to permit literates to generate and access massive collections of knowledge; to analyze and synthesize discrete information into coherent bodies of knowledge; and to perform complex procedures with accuracy and efficiency.

Like the teaching of reading to children, the teaching of reading to adults has many controversies. The same debates rage about the "whole language approach" versus the "word recognition", "decoding", or "phonics" approach in the field of adult reading as in the teaching of reading to children (McCormick, 1988).

Additionally, there are debates about the purposes of teaching adults to read, generally framed in the larger context of teaching literacy. Some argue for literacy for "empowerment," "giving voice," or stimulating "critical awareness" while eschewing reading (literacy) instruction that is "technical," that is, aimed at teaching reading "merely" as a cognitive task (Street, 1984).

Though there is no doubting the importance of the many issues involved in these debates, our literature review has found no body of empirical evidence to argue convincingly that students learn better, go further in their education, or become more successful citizens in programs operated in line with one or the other point of view. And, indeed, there is often considerable ambiguity about just what the words being used actually mean to different people (Ellsworth, 1989).

Given the controversies and the variety of ways of viewing the job of teaching adults to read, in this paper I have opted to present an analysis of what learners might learn and what teachers might teach if we view reading as one aspect of the use of graphics technology to develop tools for communicating, developing knowledge, and accomplishing various tasks (Bruner, 1968). The advantage of this approach is that it presents a body of technical knowledge that may be learned within the context of any of the various ideologies or instructional belief systems held by teachers of adults. For instance, whether one subscribes to the "whole language" or "decoding" approaches to

literacy instruction, or to "empowerment" or "functional, economic, utility" as aims of instruction, learners who wish to become literates or to improve their literacy must learn to recognize, interpret, and produce graphic symbols and devices such as forms, maps, and textbooks.

An Orientation to Adult Reading Learners

I consider that adults who are learning to read enter into the instructional setting with some considerable past history of learning. They have the capacity to learn and to problem solve in real world settings of more or less complexity. They have a knowledge base that includes the English language, both lexicon and syntax (in this paper I do not deal with teaching English as a Second Language-ESL) and the pragmatics of use of the language. Their lexical/semantic knowledge may be limited in relation to more literate age peers, though most will have been through several years of formal education.

Most adult reading learners in our literate society already possess some knowledge of the functional uses of written language and other graphic devices such as books, forms, bus schedules and so forth. But they may need to develop this understanding in greater breadth and depth. Greater "breadth" means that the more tasks a person can perform in various domains of knowledge involving the use of graphics technology and symbolic systems the more "generally literate" the person is. Greater "depth" means that the person can perform a literacy task or a set of literacy tasks more efficiently and with better quality at one time than at an earlier time.

Most of the adults encountered in adult basic education programs will have much practical knowledge of the world. They will have many beliefs and attitudes about teaching, learning, opportunities in life, success, failure, who gets ahead and who does not, and a general philosophy of what life is all about and how it is to be lived. Most will have some idea that they are in reading instruction to change some aspect of their life - to be a better parent by being able to read to their children and to serve as better role models, improve their chances in life and their self esteem by "finishing their education" and getting a high school equivalency certificate, improving their employability or getting a promotion, administering to their spiritual needs by reading religious materials, or improving their access to entertainment and personal enjoyment- through reading.

In Paulo Freire's work with technologically unsophisticated, illiterate peasants of Brazil, he found it necessary to develop a method of teaching that would make clear to adult learners the distinction between "nature" and "culture" (Brown, 1974). He emphasized that the major difference between humans and other animals was that humans made culture. Literacy, that is, reading and writing, were taught as human made, cultural tools that the peasants, too, could master and use to overcome their positions of political oppression. Thus, Freire aimed to empower the oppressed through their mastery of the culturally developed technology of literacy.

In our own, technologically sophisticated society, most adult reading learners will have considerable knowledge of the uses of tools for accomplishing various tasks in our technological

society. Therefore they possess prior knowledge that can be used to construct an understanding of reading (and writing) as the use of graphics technology for communicating, developing knowledge and accomplishing tasks. This point of view provides the content for reading instruction discussed below.

LITERACY AS TECHNOLOGY

In anthropological terms, technology is the body of knowledge a civilization uses to fashion implements, extract or collect materials, or practice various arts and skills (Morris, 1976, p. 1321). From this point of view, literacy may be thought of as technology for producing and comprehending graphic displays as tools (implements) for accomplishing various cognitive and communicational activities (Harris, 1986; Goody,1977). In writing, the person "extracts" knowledge from the brain and "collects" (stores) it in graphic displays. Then, through the practice of the skill of reading, the collected knowledge is extracted by the person from the graphic display and reconstructed in the brain.

By considering literacy as competence in working with graphics technology, instructors can help adult learners understand that much of what is encountered in teaching and learning reading results from the fundamental characteristics of graphics displays. These characteristics permit literates to work with the graphics technology in certain ways. Furthermore, the products of the work of literates create new graphics displays (e.g., history timelines; TV schedules; troubleshooting flow diagrams; atlases, etc.). This imposes demands upon new readers who wish to learn to work with these new displays.

Major Features of Graphics Technology

The major features of graphics technology, examples of the types of products that may be produced by those in command of the technology, and examples of the types of demands for information processing that the products of this technology may require include:

The Power of Permanent Thoughts

Graphic information displays, such as this page of print, or forms, tables , graphs, and so forth, are more or less permanent. Therefore, they can be used to collect or store information, including an extended body of knowledge. The information can be stored over time and retrieved later on, and it can be transported across space.

In reading instruction, the relative permanence of the graphic display permits the teaching of "reading-to-do" and "reading-to-learn" processes (Sticht, 1979). In reading-to-do, the permanence of the material permits the reader to consult it while performing a task. For instance, in filling-out a parts form in an automotive supply store, the part number can be looked-up, held in working memory just long enough to do the task of completing that part of the form, and it can then be forgotten. Because the parts catalog serves as a graphic "memory" device for storing information, the part number can be looked-up again when needed. There is no need for the clerk to memorize or otherwise learn the numbers of the parts in the store.

In reading-to-learn, much of what is taught as "study skills," or "learning strategies" reflects the property of the permanence of graphic displays and their ability to be studied at length and repeatedly read to extract the information collected in the display(s) and to relate it to prior knowledge. Strategies such as the variants of Robinson's (1946) SQ3R - Survey, Question, Read, Recite and Review - , which give suggestions for information processing before reading, during reading, and after reading, were invented because the permanence of graphic displays permits the storage of knowledge and the need, then, for new learners to acquire the knowledge by reading.

The permanence feature of graphic displays permits the storage of information over time or its transportation over space or both. This has the effect of removing the information display from its original setting or context. In turn, this makes it necessary to learn ways of making graphics displays so that they can be used out of context and of ways for comprehending such decontextualized displays. Much of what is taught about "conventionalized" devices such as topic sentences, greetings, salutations, narratives, exposition and so forth results from the capacity for decontextualization that permanent graphics displays exhibit, and the need, then, to have "recontextualizing" devices and modes of expression that literates can learn to help them process the information displays efficiently.

Information Processing in Space

Unlike speech, graphic information displays can be arrayed in space. Signs can be placed on doors, over buildings, alongside highways, and so forth; pages of print with words laid out spatially to permit the recreation of a temporal flow of speech can be constructed; forms can be developed with "slots" containing labels ("Name;" "Address;" etc.) and myriad other graphic tools to accomplish various information transmission and processing tasks can be developed (labels, lists, bus schedules; flow charts; tables; schematics; transparencies; and so on).

In mathematics, spatial layout becomes especially important in the concept of "place value." In teaching reading, students may be taught to read graphs or figures, or to analyze text materials using such graphic devices as "semantic networks," outlines, tree structures, and other devices that depend for their effectiveness on the fact that the more of less permanent, graphic displays can be arrayed in space.

Spatiality is especially important in the use of graphic displays for analysis and synthesis. For each of the three types of analysis identified by Upton (1961) there is a primary graphic device. For classification, in which objects or events are analyzed by features and then sorted into categories, the matrix is the primary graphic device. With lines forming rows and columns that intersect to form cells (graphic "pidgeon holes"), information can be sorted into various cells to fit category headings of columns and rows. The white space of an empty cell serves as an information processing aid, and reminds one to look for information that might fit the cell (Schwartz, 1971).

For structural analysis, in which the relative location of objects and/or their parts is of importance, pictures, schematics, block diagrams tree structures, or similar devices that display

information spatially are the primary tools of analysis. Devices such as tables of contents and indexes display the relationships among the parts (chapters) and contents (indexed terms) of a text to the total book.

For process or procedural analysis, in which the sequencing of events over time is the object of analysis, the flow chart is the primary graphic device. With the use of special symbols such as arrowheads, the steps required to accomplish some task can be arrayed spatially, read sequentially and guide the task performance of the reader.

With each of these graphic tools, the products of analysis are synthesized into a new display in which the spatial aspect of the graphic display permits and facilitates important information processing functions. A large amount of the success of such displays reflects the fact that they take advantage of visual perception. For instance, things grouped together in close proximity tend to be perceived as distinct from other things and as belonging to one another. This is a useful method for uniting perceptual and semantic "chunking" to aid in overcoming memory load and for organizing information for learning, as in the use of "mind maps" or other forms of semantic networks (Dansereau, 1978).

The Guiding Light

The third major feature of graphics technology that is drawn on in literacy is the use of light. The marks that are made to produce such graphic symbols as written or printed words, numbers, arrowheads in procedural flow charts, the white space of the cells in a table (matrix) and so forth are constructed by structuring the light that leaves the surface of the graphic medium such that the eye can detect the structure in the display.

The properties of light that are used most in graphics technology are brightness and color. Brightness provides the contrast that makes writing possible. That is, the "black" of the line of writing (or type) is in contrast to the "white" background.

Brightness provides contrast that can be used in conjunction with permanence and spatiality to aid information processing, such as the use of "white space" in arranging information spatially on pages to facilitate semantic "chunking" for learning.

In addition to aiding in overcoming memory limitations and facilitating learning through various semantic "chunking" and organizing devices, the properties of light are extensively used to aid attention during information processing. **Bold print** may be used to call attention to certain information and *color* can guide information processing, as when a red line is used in an electronics diagram to permit a particular circuit to be traced in an array of circuits printed in black.

Learning strategies instruction may include pre-reading activities in which bold faced, italicized, or segregated (as by white space) words or phrases are first surveyed to activate prior knowledge about what is to be read in greater detail. This is done to increase comprehension and make learning more effective.

Study techniques such as highlighting or underlining with colored pens use the electromagnetic spectrum as tools for focussing attention and reducing the amount of information that must be processed in a second reading (itself a learning strategy made possible by the permanence feature of graphics technology).

As with all technology, the power of graphics technology arises from its use to develop tools for amplifying and extending human capabilities (Bruner, 1968). However, unlike hammers, sewing machines, automobiles, and other technologies that extend human strength, dexterity, or locomotion abilities, graphic technologies gain their power from their application to the extension of human cognition and the ability to manipulate information in symbolic form.

In particular, the merging of graphics technology with spoken language, itself a form of human technology for communicating with symbols, produces the power behind, and the awe and appreciation of, literacy.

The Graphic Representation of Spoken Language

The capstone achievement in graphics technology was the development of the **alphabet**, a relatively simple technology by means of which a few graphic marks can represent enough aspects of the oral language that the marks permit a reader to reconstruct a language-based message from the graphic display (Harris, 1986). The importance of this is that it permits graphic language to draw on the power of oral language for representing and communicating knowledge, while bringing the power of the three features of graphics technology to bear on the development of new knowledge and tools for thinking and problem solving (see the Appendix for references to research on listening and reading processes of adults).

For those adults with little or no reading ability, instruction generally centers on *decoding* or reconstructing a spoken message from the graphic display or "code." The written display is called a "code" because it is considered an alternative representation of speech. In a simple substitution code one element in a message, such as the sequence 1,2,3 is substituted by another set of symbols, such as a,b, and c. In decoding, then, a is converted to 1, b to 2, and c to 3.

Though such a simple, one-to-one correspondence of speech and graphic symbols does not hold over the full range of the English language, enough correspondence is there to make the technology work.

In the teaching of decoding in what is sometimes called the *principle of the alphabet* (Liberman, Shankweiler, & Liberman, 1989) learners are taught to substitute a speech sound for a graphic alphabet symbol (phonics). In teaching writing they are taught to make alphabet characters that can, in turn, represent speech sounds.

Of course, the success of this phonics approach depends upon the learner's ability to detect the different sounds in speech and to then associate the graphic symbol to the spoken symbol. Because some learners have difficulty in both these activities, methods have been developed in which

instruction first aims to ensure that the sounds of speech can be discriminated, and then mnemonic systems are used to aid the learning of what are essentially arbitrary associations of graphic and spoken symbols.

In the Auditory Discrimination in Depth (A.D.D.) program (Lindamood & Lindamood, 1975) the discrimination of speech sounds is taught using a number of graphics aids, such as big pictures of the lips, the tongue and other illustrations that depict the *place* (lips together versus apart, etc.) and *manner* (voiced or unvoiced) of articulation of speech sounds. This approach teaches how speech is made and provides conceptual awareness of the segments of speech, a body of knowledge that can be used to understand how oral language is produced and a mnemonic system that can be used to learn the arbitrary sight-sound correspondences involved in reading.

Various volunteer tutoring programs teach decoding using some form of mnemonics to learn sight-sound associations. However, they do not routinely teach conceptual awareness of speech segmentation first, as in the A.D.D program. This may or may not pose a problem depending upon how aware the learner is of the sounds of speech. It is a factor that should be considered when teaching the associations used in reading decoding to adults (or children, too, for that matter) (Golinkoff, 1975).

The creation of phonemic awareness and the use of mnemonics is important when it is understood that in teaching phonics or other decoding techniques we are teaching *knowledge*, that is, an organized body of facts about the alphabet and speech. Most often the teaching of decoding is referred to as teaching decoding *skills*. This is misleading, however, because one cannot teach skills. Skills have to develop through practice guided by modeling and coaching. What we teach when teaching decoding is a set of facts (e.g., this sight goes with this sound). We know that in learning bodies of arbitrary facts, methods such as mnemonics, systematic organization by rules that aid recall, and explanations that lead to understanding can facilitate learning. Sometimes, by thinking in terms of skills, teachers forget to use what is known about teaching knowledge. By keeping in mind the knowledge that is being taught in decoding, learners can be taught more successfully and expeditiously the knowledge they need to develop the skill they need for reading.

Writing and reading. It is particularly advantageous to teach reading by introducing learners to writing. This is a useful way of further clarifying the fact that the alphabet is a graphic technology for representing spoken language. In writing, ideas are first expressed (encoded) in spoken form and then recoded into written form. This emphasizes the importance of *meaning* in reading by helping learners understand that just as in writing, wherein one starts with meaning, in reading one aims to end up with meaning.

The importance of meaning in both writing and reading can be introduced by first having students represent their thoughts in a non-language based graphics technology - pictures. For instance, a learner may be asked to draw a picture illustrating the sentence, "The car stopped at the crosswalk." This teaches that (1) meanings, thoughts, or, more generally, *knowledge* comes first, and (2) knowledge can be represented using graphics technology. This understanding can be extended to explain that, just as drawings may represent knowledge expressed in the spoken language, the written language is a form of "drawing" that can represent the spoken language.

By thinking of writing and reading together as the use of graphics technology for producing and communicating knowledge (meaning), the issue of whether reading is best thought of as a "bottom-up" or a "top-down" process is addressed (McCormick, 1988). Clearly, in writing, the goal is always to construct and communicate knowledge, and that entails the formulation of a plan for communicating and the possession of knowledge that can be represented first in the spoken language and then in the written language. Thus the representation process proceeds from the "top-down." But just as one cannot comprehend spoken language without attending to what is being said, one cannot comprehend the written language without first looking at the graphic display, and therefore reading entails processing that is "bottom-up."

It may be important to teach the adult new reader that the goal of reading is to use the written word to construct meaning, as in some of the "whole language" approaches (McCormick, 1988). This may be necessary because the attention needed to learn the written code may cause the learner to concentrate so much on the decoding process that insufficient attention is given to trying to understand the message.

Knowledge, The Human Cognitive System, and Reading

Just as the oral language is used to represent knowledge (ideas; thoughts) in the acoustic medium, the alphabetic writing system is used to represent knowledge in the graphic medium. In both these cases, knowledge is both the beginning and end product of communication.

Because knowledge can be represented in different modes, as in drawings, speech, written language, dance, and so forth, it is useful to consider the person as possessing a knowledge base that can be operated on by different sets of procedural rules (themselves a part of the knowledge base) to represent the knowledge. In a very simplified model of a human cognitive system (HCS), the system has a long term memory in which the knowledge base is stored, and a short term or working memory that is actively involved in processing information.

When the person is listening to speech, the HCS is picking up information in the acoustic medium and simultaneously picking up information from the internal knowledge base and merging the two to comprehend the message. Similarly, in reading, the person picks-up information from an external store of knowledge (a book; sign; list; table; etc.) and merges it with knowledge picked-up simultaneously from the internal knowledge base.

From this model, it is clear that the success of reading for comprehension rests upon (1) the possession and access of content knowledge relevant to what is being read; (2) the possession and access of task-relevant information processing (procedural) knowledge, including planning or goal-setting (metacognitive) knowledge and knowledge of strategies for learning from texts; oral language representation knowledge (grammar: lexicon and syntax; communicative knowledge, such as questioning for clarification) and written language representation knowledge, including various communicative conventions developed by literates over time (such as topic sentence and supporting details in expository materials) and (3) an external information display that can be accessed, scanned (read), and transformed into an internal representation in working memory for use in performing some

task (reading-to-do) or with transfer to the long term memory or knowledge base when learning is desired (reading-to-learn).

Organizing these various components and processes of the human cognitive system into a program to help adults expand their knowledge of and skill in using graphics technology for reading is a formidable task. How one proceeds depends in large part upon the needs of the adults being served. Adults with the absolute minimum knowledge of the alphabet and writing will require education in the alphabetic principle and its use in reading. There will be a need for extensive practice in decoding before these adults can give a skillful reading performance.

Though it is not always the case, most adults who possess the very least knowledge of and skill in reading will also possess poorly developed oral language ability, and particularly a poorly developed lexicon. In addition to learning the graphic technology of literacy, they will require extensive vocabulary and conceptual knowledge development, in a wide array of domains, over an extended period of time, to become broadly literate.

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Appendix

In the United States, the Workforce Investment Act of 1998, Title II: The Adult Education and Family Literacy Act (AEFLA), draws a direct connection between adult's oral language skills of speaking and listening, and their literacy skills of reading and writing. It emphasizes listening and reading relationships through its reference to instruction that includes "phonemic awareness," "systematic phonics," "fluency," and "reading comprehension." Following is a list of references on research on the listening and reading processes of adults for those who wish to cite research in their applications for program funding under the Adult Education and Family Literacy Act.

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