

Brain-Compatible Learning Succeeds

An unusual program based on brain research and theory is achieving remarkable results in a New Jersey elementary school.

At Perry L. Drew Elementary School in East Windsor, New Jersey, we have been studying learning styles and flexible teaching styles for five years. In September of 1985 we began our third year of designing an instructional setting and implementing instructional practices based on recent brain research.

Based on the recommendations of Leslie Hart, our chief consultant, we offered our brain-based learning program as an option to the regular curriculum. Of Drew's 170 K-2 students, 120 enrolled in the program. Drew serves a middle-class community with a strong interest in quality education.

A staff of a unit leader and five

teachers, volunteers for the program, were selected to implement it. They received advance orientation but no special training other than a review of the research on brain theory. Drew's program is based on Proster Theory, which was developed by Hart (1975, 1983) and his associates.



Theory That Proves Practical

Proster Theory is a holistic approach to "what the brain is for." New neurophysiological knowledge is only one component of the theory, which integrates findings from several related disciplines. For years, Hart and associates have developed and tested in-school applications of the principles. It is not surprising, therefore, that aspects of the theory suggest what to do and avoid and have proved easily translatable to daily operations.

According to Proster Theory, the brain is much like a complex, powerful analog computer, able to move simultaneously down a hundred paths. The theory emphasizes the key role of *patterns* and *programs*. The brain, by nature, extracts patterns from confusion, if provided with enough input. Programs—or sequences of steps to reach a foreseen goal—are built by each individual by the thousands, and learning is defined as *the acquisition of useful programs*. Pattern recognition (very difficult to teach directly) enables learners to select appropriate programs, that, in turn, enable them to perform and move level-by-level toward mastery. Clearly, these are concepts far removed from "right-answer" inculcation.

After presenting the theory and helping the volunteer team rough out the major design aspects of the approach, Hart and two other consultants stepped back to allow the team to handle implementation *their* way. Consultants appeared on-site only at intervals. The team members introduced changes and worked out problems themselves, sometimes with astonishing speed. The basic agreement to work within the theory and a 14-page protocol, written by Hart at the team's request, provided direction and unifying limits. As intended, the staff felt strong ownership of the program.

The Multi-Teacher Interactive Learning Unit

All 120 students and their teachers composed a single Multi-teacher Interactive Learning Unit. Within a large, open, carpeted space, students move

freely, working on the floor or at tables. Teachers arrange their desks in a rough square in the center to permit quick planning meetings and supervision. Students gather in flexible groups of various sizes, as focus or activity dictate. There is no segregation by grade, and individual progress reflects the theme "take the brakes off learning." Two walled rooms are used for noisy activities, such as vigorous rote, and to house typewriters and computers to which students have free access. Each student is assigned to a "guiding teacher," who meets privately with students at least once every 14 days to discuss progress, problems, and special projects.

The one-to-one conferences are an important feature of the program. Said one teacher, "In 12 years of teaching, I never had the opportunity to meet with a child routinely like this!" Students were delighted to have a teacher's undivided attention, a new experience for them. As a result, outside study found that teachers build a strong concept of knowing exactly what they are seeking to accomplish rather than merely "covering the material" and are able to focus on broader, sounder learning (Educational Testing Service, Princeton, New Jersey).

Learning to operate as a team was the most difficult aspect for the teachers. On the whole, the transition was accomplished remarkably well—with an occasional "blowoff" to prove they were human. Consultants emphasized aiming for *loose* teaming, rather than trying to agree on every detail and giving excessive time to meetings. Here again, the foundation of theory and protocol greatly helped to bring cohesion and a sense of common purpose and effort.

Over time, the conventional "class"—with its logical, sequential presentation of content—has almost disappeared in favor of rich, random instruction with much broader, long-term objectives, and a global "subject" approach. The aim is to provide students with far more input and hands-on experience. All students, for example, begin to write, even before some fully know their letters.

Writing is emphasized daily and heavily. To increase input, all students attend brief daily presentations given by staff, other school personnel, parents, community members, and other visitors. These "spark" presentations stress real-life activities and experiences. During the year, more than 150 of these presentations lead individual students or small groups to investigate the topics further, often using the library/media center, to which they have free access. Some students have written and "published" books or made presentations themselves.

Most students see the sparks as the high point of their day, but the flexible instruction by a staff whose creativity has been set free has proved to make every day an adventure in learning for students.

Three principles deriving from the theory have been readily implemented:

- *Freedom from threat.* Since the neocortex or giant "new brain" functions best when one feels secure, children are made to feel that within the unit nothing bad will happen to them. Students are remarkably relaxed, happy, and busy.

- *Communication emphasis.* Reading, writing, listening, and talking with others are regarded as interrelated. Since young children must talk to learn, talking and mutual help are encouraged and facilitated.

- *Reality emphasis.* Activities recognize the child's need to feel increasing control of his or her world, by providing for *manipulation, making, designing, and doing* as opposed to mostly sitting and listening. Each curriculum area is kept tightly related to real life.

New Roles for Teachers

As the teachers have seen brain-compatible instruction working, they have begun to abandon teacher-driven activities in favor of more student-driven learning, working increasingly as guides and facilitators. The protocol emphasizes mastery—100 percent attainment of set levels. Use of conventional grading has been largely eliminated. Evidence is strong that when allowed to learn at their own pace in a stimulat-

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ing environment, students became eager, successful learners.

Among notable design elements are daybooks, in which students record activities, interests, and achievements; vigorous *rote* learning where indicated; formal lessons on courtesy and respect, by all and toward all; and display of natural vocabulary, without regard to grade level.

Proster Theory recognizes the need children constantly have to make sense of their world. To meet this need, a simulated community study called Mearatropolis (named for Philip Meara, the inventive leader of the unit) operates in the grades 1-2 unit throughout the school year. Students learn how to run their own government by holding court and electing a mayor, council members, and police and fire chiefs. Intensive business operations create student shopowners

who sell a variety of goods to eager customers, who spend their special money, earned from jobs they take very seriously. Every Friday they go to the “bank,” where they get paid and make deposits or withdrawals. They publish and sell a community newspaper. Some products are manufactured in the kitchen or workshops. The use of actual coins adds reality to arithmetic. Students enjoy the experience, while expanding their understanding of how things work in the real world.

Does this free, stimulating environment result in frenetic behavior? On the contrary, discipline problems, if any, are minor because children are constantly encouraged to use extreme courtesy (as the adults do), not only toward staff but also toward friends and peers, and they are intensely absorbed in what they are doing.

Although instruction might appear to be random on a given day, the basic learning areas get well-designed coverage on a yearly basis. The emphasis in mathematics is on grasping patterns and linking them to the real world. Language arts stresses communication rather than fragmented topics. Science focuses on the fundamentals of observation and measurement; and social studies deals with real world exposures and activities. The established curriculum is followed but greatly expanded.

Outcomes

Overall, the project has achieved a high degree of success. A survey of parents indicates strong satisfaction with their children's progress and attitudes. Some parents have minor criticisms and suggestions, but on the whole, initial doubts have given way to vigorous approval. The unit teachers also indicate strong approval, and other teachers at Drew have expressed interest in becoming involved in brain-based programming. Community members have volunteered as helpers, “scribes,” “poetry persons,” and as demonstrators of special skills, which adds to their support for the program.

Evaluating such an unconventional program is not easy. Our Iowa Test

scores have consistently ranged in the mid-90th percentile, but we do not consider these tests an adequate indicator of the full program's success. Close monitoring, in part via the student-teacher conferences, suggests excellent growth in learning. Criterion-referenced tests in math show a high degree of 100 percent mastery, and vocabulary testing shows growth of two to three years for weak and strong students alike.

Holistic scoring of writing samples, spring to fall, shows well over 10 months growth for all grades in the program. A thorough study of student journals conducted by Susan Glazer found highly satisfactorily, sound growth of students' command of written English.

Proof of the pudding came after the first year ended, when the program, no longer an option, was extended to include all students in the unit and all 3rd graders in the two other units. This year the program has been further extended to all 700 K-5 students in the school. Even though the first two years involved much transition and development and only three teachers have had a full two years' experience with the theory and application, the verified progress is remarkable.

Not least in outcomes, certainly, is the spirit, teamwork, interest, and enthusiasm of all. We are not aware of any other effort that so completely springs from modern brain theory. To no one's surprise, the intuitions of able, experienced teachers proved to harmonize well with guidelines derived from increasing knowledge about the human brain.

References

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