

A School for All Intelligences

The theory of multiple intelligences emphasizes the highly varied capacities of human beings. To encourage children's *full* development, we need fundamental changes in schools, as seen today at the Key School in Indianapolis.

Recent discussions about the restructuring of schools focus on ways in which institutional settings and teacher roles can enhance student learning. This is an important concern, but the issue of curriculum content—what should be taught and why—is still relatively neglected. Our research group, Harvard Project Zero, has been examining these questions through the lens of the theory of multiple intelligences. We would like to describe this theory, some of the research projects it has engendered, and its implications for elementary and secondary education.

The theory of multiple intelligences (MI theory) challenges the prevailing concept of intelligence as a single general capacity which equips its possessor to deal more or less effectively with virtually any situation. MI theory paints a more variegated and contextualized picture, positing a number of intelligences. Based on Gardner's empirical work with normal and gifted children, as well as on studies of brain-injured adults, it defines an intelligence as the capacity to solve problems or fashion products which are valued in one or more cultural settings.

Realms of Intelligence

As described in Gardner's 1983 book *Frames of Mind*, MI theory proposes that people use at least seven relatively autonomous intellectual capacities—each with its own distinctive mode of thinking—to approach problems and create products. These include linguis-

tic, musical, logical-mathematical, spatial, bodily-kinesthetic, interpersonal, and intrapersonal intelligences. Although they are not necessarily dependent on each other, these intelligences seldom operate in isolation. Every normal individual possesses varying degrees of each of these intelligences, but the ways in which intelligences combine and blend are as varied as the faces and the personalities of individuals.

MI theory suggests some compelling alternatives to current educational practices in several areas.

1. *Range of abilities addressed.* According to MI theory, it is important for education to address other human abilities and talents besides the linguistic and logical-mathematical intelligences which have long been the primary focus of most schools (Gardner 1987b).

2. *Learning environment.* By acknowledging the wide variety of valuable—and independent—domains, MI theory calls for an attendant shift in instructional conditions. Typical classroom procedures rely heavily on linguistic and logical-mathematical symbol systems. However, one cannot develop musical intelligence, for example, merely by talking and writing about music.

MI theory proposes that people use at least seven relatively autonomous intellectual capacities—each with its own distinctive mode of thinking—to approach problems and create products.

Sustained, hands-on practice with the procedures, materials, and problems of such a domain are crucial to achieving deep knowledge within it. Hence, MI theory places an emphasis on learning in context, particularly via apprenticeships.

3. *Assessment measures.* MI theory challenges the viability of standardized, machine-scored, multiple-choice assessments, which by their very nature appraise students' knowledge through the filter of the linguistic and logical-mathematical intelligences. Each intelligence needs to be assessed directly, in contexts which call it into play (Gardner in press, a).

4. *Concept of learner.* By proposing that each person possesses a distinctive combination of intelligences, MI theory emphasizes the highly individualized ways in which people learn. It calls into question the prevailing policy of educating all students in the same subjects with the same methods and materials. To students with high degrees of spatial intelligence, for example, the history of an era might best be introduced through art, architecture, and/or geography. For students with high interpersonal or linguistic intelligences, biographies and dramatic reenactments might prove better vehicles (Gardner 1987a).

Recent Research Projects

At Project Zero, we have begun to explore these alternatives in a series of research projects, each addressing specific facets of education at the primary, middle, and secondary levels. Project Spectrum, a collaboration with David Feldman of Tufts University, developed intelligence-fair assessment measures to identify and describe the various intellectual strengths exhibited by preschoolers (Krechevsky and Gardner in press, a). These evaluation measures—number games, storytelling activities, creative movement exercises—double as part of the classroom curriculum and as free-play activities. As in other initiatives, we deliberately blur the traditional line between curriculum and assessment, thus enabling students to be assessed in natural, familiar, and non-threatening contexts.

Arts PROPEL, a collaborative research project with the Educational Testing Service and the Pittsburgh Public School System, assesses middle and high school students' growth and achievement in artistic endeavors (Gardner 1989a). By working through "domain projects" and compiling their own portfolios, students learn to reflect on and evaluate their work in music, creative writing, and visual arts.

Carried out in collaboration with Robert J. Sternberg at Yale University, the Practical Intelligence for Schools project (PIFS) has developed meta-curricular units that can be infused into the curriculum typically taught in middle school classes. These infused units help students to focus on problems which predictably arise in the traditional content areas of mathematics, social studies, and reading and writing (Krechevsky and Gardner in press, b). Typical problems include how to take notes, how to revise an essay, and how to use resources for a term paper. The units encourage students to identify their own intellectual strengths and abilities and to draw on them as they tackle academic problems.

Our Vision of an MI School

These and other pilot studies provide glimpses of what a school might ac-

The ways in which intelligences combine and blend are as varied as the faces and the personalities of individuals.

complish if it were to embrace MI theory at all levels of operation. Because no such school exists as yet, we offer here our own personal vision of what such a school would be like. Details from our pilot studies fill out this picture; they represent the initial steps schools are now taking toward nurturing the development of multiple intelligences in all children.

The school we envision commits itself to fostering students' deep understanding in several core disciplines. It encourages students' use of that knowledge to solve the problems and complete the tasks that they may confront in the wider community. At the same time, the school seeks to encourage the unique blend of intelligences in each of its students, assessing their development regularly in intelligence-fair ways. To achieve these goals, the school draws inspiration from the educational successes of non-school enterprises. Modeling the fresh and engaging approach of children's museums, the school creates an atmosphere in which students feel free to explore novel stimuli and unfamiliar situations. In the spirit of traditional apprenticeships, it promotes students' sustained and guided efforts on individual projects. Students and teachers collaborate in an environment that is at once unconstrained and purposeful.

Our school day reflects these ideals. In the mornings, students study the traditional subject areas but in untraditional ways. Almost all the work in mathematics, social studies, reading and writing, and science takes the form of student projects. Students explore particular aspects of material in depth, addressing problems that confront professionals in the discipline. For instance, they might attempt to make sense of conflicting reports about a single historical event or to define a scientific problem and then informatively explore it by carrying out small-scale experiments (Gardner 1989b).

Arts PROPEL provides a model for this kind of learning via projects. The domain projects developed for this study provide a rich series of exercises to help students focus on a particular

aspect of an art form (composition in the visual arts, characterization in playwriting, rehearsal in music). Students work through these projects, keeping their drafts, revisions, final products, and observations in a portfolio (a better name might be "process-folio"). This documentation of the student's creative growth serves as a catalyst for her own reflections on herself as learner and fledgling artist. The student's work is assessed by examining the final product, her thinking informing it, and her plans for subsequent projects.

The second half of our school day is a natural extension of the first. During this time, students and teachers venture out into the community for further contextual exploring and learning. The younger children and their teachers often travel to a children's museum, a playground, or a special participatory demonstration at the local theater, symphony, or art museum. These excursions differ from typical field trips because classes return to the same spots many times over the course of the year. Students can continue projects begun in previous visits (perhaps working on a sculpture at the local art museum or continuing study on the life cycle of the crabs at the aquarium) or hone their skills in favorite activities (examining butterfly specimens at the children's museum or playing the tympany at the symphony demonstrations). Teachers prepare students for these experiences by planning related in-class projects and discussions and debrief them afterward in parallel ways.

Such educational bridges could be constructed with programs like a current Project Spectrum initiative which seeks to create thematic ties between preschool curricula and museum exhibits through the use of kits. Organized around topics which intrigue young schoolchildren, these kits provide activities which can be used in school, museum, and home settings to stimulate a range of intelligences. The "Night and Day" kit, for example, includes a game board (featuring children's usual night and day activities) which facilitates exploration of num-

MI theory places an emphasis on learning in context, particularly via apprenticeships.

ber concepts. Books and related storyboards stimulate language skills, and "shadow games" encourage students' active investigation of the concepts of "light" and "dark."

Whether at the museum or our enriched school environment, children are allowed to explore freely and encouraged to ask questions. Teachers, aides, and other adults (including those who staff the field trip sites) jot down notes (or make mental ones to be written down later) about the children they are watching. Which students show interest or skill in particular activities or exhibits? What sorts of questions do students ask? What tasks do they have difficulty with?

Project Spectrum employs a similar in-school technique for compiling information about a student's intellectual proclivities. In a Spectrum classroom, students are provided with a variety of rich materials designed to stimulate particular intelligences. A treasure hunt game helps to develop children's abilities to make logical inferences. Assembly activities involving simple mechanical objects draws upon their fine motor skills. A storyboard composed of an ambiguous landscape and imaginative figures and objects (a

king, a dragon, a jewel box) fosters children's skills in using descriptive language, dialogue, and narration. Over the year, teachers and observers make notes about the activities students gravitate toward and the progress they make in working with the materials. At the end of the year, parents receive a Spectrum Report: a short essay detailing the child's intellectual profile, along with suggested home or community activities that might foster growth in areas of particular strength or weakness.

These reports play a prominent role in the MI-based school. Teachers and parents observe how the child carries out tasks and projects in the classroom, on field trips, and at home and put their notes into the files the school's assessment team keeps on each child. Video documentation of the student's projects, activities, and personal observations and preferences is also a possibility—and is in fact being carried out at the Key School, an Indianapolis public school strongly influenced by MI theory (Olson 1988). A record of the student's own preferences completes the collection. When a student reaches 3rd grade, he and his parents meet with a member of the assessment team to review the variety of strengths and preferences he has exhibited thus far. Together, they choose the three apprenticeships he will pursue within the school and community in the coming years.

Like the Key School, our school not only takes its students into the community but also brings the community to its students. Community members volunteer to share their expertise in some craft or occupation by working with a small group of students who have expressed interest in it. In addition, a "flow period" gives students time to play with games, activities, and ideas that appeal to them (while observers take note of their preferences and strengths). The important point here is that students can explore interests and abilities not necessarily tapped by the typical school curriculum.

In our school, older students carry on this intellectual exploration in a

more structured way. While continuing to spend mornings carrying out the projects of the basic core curriculum, they devote their afternoons to the apprenticeships they chose as 3rd graders. They study intensively with "master" teachers, members of the community who possess expertise in a particular area. Each student pursues an academic discipline, a physical activity, and an art or craft. Just as in the early years, when their school encompassed numerous exploratory opportunities in the wider community, now the workplaces and studios of their various masters become another richly contextualized extension of the classroom.

Adults in the community can participate in two ways. Some become masters; they devote time to working intimately with an apprentice. Others, while not working directly with apprentices, provide ideas for particular projects which advanced apprentices can carry out with minimal guidance from their masters. Such projects might include designing and painting murals for particular buildings or businesses, developing a more efficient record-keeping system for the public library, or composing music for a school event. Each adult meets with a member of the school's community liaison team, which keeps names of potential masters and projects in the community/school opportunities bank. These are shared with the assessment team as it guides students in selecting their apprenticeships. In addition, the community liaison team monitors the progress of the apprenticeships and projects, intervening constructively if problems arise.

What's Next?

Whatever the fate of these pilot projects, MI theory has the potential to dramatically alter the ways in which we think about schools and about education. However, we cannot realistically expect schools as they are now to assume the full burden of educating such a range of human intelligences. To restructure education, we must enlarge the circle of responsible individuals.

To restructure education, we must enlarge the circle of responsible individuals.

Only a "full-court press" of support from parents, community leaders, neighborhood organizations and institutions, concerned adults from all walks of life, and broad-minded educators will help our communities achieve viable schools for the future (Gardner in press, b, c).

There are many possible schools, given the diversity of resources, both human and material, that make up individual communities. And since MI theory is, at most, a charter and not a cookbook, this is all to the good. However, we suspect that all MI-inspired schools will share at least a few important features. Even traditional subjects will be taught in a variety of ways, thereby addressing the varied intelligences of students and their teachers. Assessment will be intelligence-fair and will take place, as much as possible, in the context of the rich and engaging projects that make up the daily curriculum. As a result of such a regimen, we expect that students will end up having a stronger and more fruitful understanding of themselves—their strengths, their distinctive approaches, the particular vocational and avocational roles for which they might be suited.

Many individuals have now entered into discussions of school reform; some are drawn from the domain of educational research, others from the practical world of classrooms. Too often, the gulf between educational theory and practice remains unchallenged. In the long run, there is nothing so practical as a good theory, but a theory without the opportunity for real-life implementation will soon fade away. At Project Zero, we seek to span this gulf. By working together as equal partners on projects of mutual interest, educators and researchers can form productive collaborations through which we can effectively restructure our schools, leading ultimately to the fuller realization of our children's rich potential. □

References

- Gardner, H. (1983). *Frames of Mind: The Theory of Multiple Intelligences*. New York: Basic Books.
- Gardner, H. (1987a). "An Individual-Centered Curriculum." In *The Schools We've Got, the Schools We Need*. Washington, D.C.: Council of Chief State School Officers and the American Association of Teacher Education.
- Gardner, H. (1987b). "Developing the Spectrum of Human Intelligences." *Harvard Educational Review* 57: 187-193.
- Gardner, H. (1989a). "Zero-Based Arts Education: An Introduction to Arts PROPEL." *Studies in Art Education: A Journal of Issues and Research* 30(2):71-83.
- Gardner, H. (November 8, 1989b). "The Academic Community Must Not Shun the Debate on How to Set National Educational Goals." *The Chronicle of Higher Education*, A52.
- Gardner, H. (In press a). "Assessment in Context: The Alternative to Standardized Testing." In *Report of the Commission on Testing and Public Policy*, edited by B. Gifford. Boston: Kluwer.
- Gardner, H. (In press b). "The School of the Future." In *The Reality Club*, edited by J. Brockman. New York: The Education Foundation.
- Gardner, H. (In press c). "Four Factors for Reforming Education." *On The Beam*.
- Krechevsky, M. and H. Gardner. (In press a). "The Emergence and Nurture of Multiple Intelligences." In *Encouraging the Development of Exceptional Intelligences*

and Talents, edited by J.J.A. Howe. Leicester, U.K. The British Psychological Society.

Krechevsky, M. and H. Gardner. (in Press b). "Enhancing Scholastic Performance: An Infusion Approach." In *Developmental Perspectives on Teaching and Learning Thinking Skills*, edited by D. Kuhn. Basel: S. Karger

Olson, L. (January 27, 1988). "Children Flourish Here." *Education Week*, 1.

Autors' note: The research described in this article has been generously supported by the Grant Foundation, the Lilly Endowment, the McDonnell Foundation, the Rockefeller Brothers Fund, the Rockefeller Foundation, the Spencer Foundation, and the Bernard Van Leer Foundation.

Tina Blythe is a Researcher and **Howard Gardner** is Co-director, both at Harvard Project Zero, Harvard Graduate School of Education, 323 Longfellow Hall, Appian Way, Cambridge, MA 02138.



BEYOND EFFECTIVE SCHOOLS OUTCOME-BASED EDUCATION

*Schools with high standards and high expectations
where every student earns A's and B's*

THE OBE PRACTITIONER'S HANDBOOKS by Charlotte Danielson In use in more than 45 states and 7 foreign countries.

Practical help for teachers, principals, and central-office administrators implementing Outcome-Based Education/Mastery Learning from an educator who has been involved in all phases of planning and implementation.

In this series of 6 booklets, you'll find out what is possible, what is involved, and what to do when to create an effective outcome-based program.

"Written very clearly and concisely . . . I have purchased them for each member of my board."

"Complex concepts clearly explained. . . . Excellent and on target."

ORDER YOUR SET TODAY!

Introducing OBE—An overview of outcome-based education: how and why it works

The Outcome-Based Curriculum—Alignment and integration, testing, materials

Developing the Building Plan (Elementary Grades)—Team planning, grouping of students, and school and parent communication.

Teaching for Mastery—Applying the best instructional practices.

Using Categorical Funds for OBE—Using a significant resource effectively.

A 5-Year Action Plan—An implementation plan discussing the "who," "what," "when," "where," and "how."

Individual titles \$6.95 each (quantity discounts on 10 or more of one title)

Set of all 6 titles. \$38.50 (quantity discounts available—10 or more sets)

Please add 10% shipping and handling to all orders

MAIL ORDER TOGETHER WITH PAYMENT OR PURCHASE ORDER TO:

OUTCOMES ASSOCIATES • PO Box 7285 • Princeton, NJ 08543-7285



Components of PARENTS AS PARTNERS IN READING:

- training manual written by Dr. Edwards in a sturdy 3-ring binder
- 3 videotapes for use in parent training sessions
- a selection of children's books chosen by Dr. Edwards for home and class use by parents and children

Childrens Press is proud to announce...

Parents as Partners in Reading

A Family Literacy Training Program

by Patricia A. Edwards, Ph.D.

Why has PARENTS AS PARTNERS IN READING evoked so much interest and enthusiasm among those who, like yourself, are concerned with wiping out illiteracy in America? As an educator, you can appreciate the reason:

Any program which trains parents to read effectively to their children...and which is so remarkably successful at getting parents involved, represents a major breakthrough in the effort to give our nation's children the reading skills they must have.

PARENTS AS PARTNERS IN READING is a tested program that helps bridge the gap between teachers and parents and demonstrates the practical ways in which they can work together.

The step-by-step approach is practical, research based, school based, and community based. PARENTS AS PARTNERS IN READING enables any school, library, or organization to successfully initiate a Family Literacy Training Program.

PARENTS AS PARTNERS IN READING is available exclusively from Childrens Press. It's a program that works! For more information, please call toll free 1-800-621-1115.



Childrens Press®

5440 N. Cumberland Ave., Chicago, IL 60656 312/693-0800 / 1-800-621-1115 (Toll Free Number)

Copyright © 1990 by the Association for Supervision and Curriculum Development. All rights reserved.