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 linguistic, 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.
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 accomplish 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
MI theory places an emphasis on learning in context, particularly via apprenticeships.
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 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 for educating such a range of human intelligences. To restructure education, we must enlarge the circle of responsible individuals.

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