

Orchestrating Multiple Intelligences

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No need to create nine different lesson plans. Instead, design rich learning experiences that nurture each student's combination of intelligences.

Education policymakers sometimes go astray when they attempt to integrate multiple intelligences theory into schools. They mistakenly believe that teachers must group students for instruction according to eight or nine different intelligence scores. Or they grapple with the unwieldy notion of requiring teachers to prepare eight or nine separate entry points for every lesson.

Multiple intelligences theory was originally developed as an explanation of how the mind works—not as an education policy, let alone an education panacea. Moreover, when we and other colleagues began to consider the implications of the theory for education, the last thing we wanted to do was multiply educators' jobs ninefold. Rather, we sought to demonstrate that because students bring to the classroom diverse intellectual profiles, one "IQ" measure is insufficient to evaluate, label, and plan education programs for all students.

Adopting a multiple intelligences approach can bring about a quiet revolution in the way students see themselves and others. Instead of defining themselves as either "smart" or "dumb," students can perceive themselves as potentially smart in a number of ways.

Profile Students, Don't Score Them

Multiple intelligences theory proposes that it is more fruitful to describe an individual's cognitive ability in terms of several relatively independent but interacting cognitive capacities rather than in terms of a single "general" intelligence. Think of LEGO building blocks. If we have only one kind of block to play with, we can build only a limited range of structures. If we have a number of different block shapes that can interconnect to create a variety of patterns and structures, we can accomplish more nuanced and complex designs. The eight or nine intelligences work the same way.

The greatest potential of a multiple intelligences approach to education grows from the concept of a *profile* of intelligences. Each learner's intelligence profile consists of a combination of relative strengths and weaknesses among the different intelligences: linguistic, logical-mathematical, musical, spatial, bodily-kinesthetic, naturalistic, interpersonal, intrapersonal, and (at least provisionally) existential (Gardner, 2006).

Most people have jagged profiles; they process some types of information better than other types. Students who exhibit vast variation among their intelligences—with one or two intelligences very strong and the others relatively weak—have what we call a *laser* profile. These students often have a strong area of interest and can follow a clear path to success by developing their peak intelligences. Given the ubiquity of high-stakes testing, educators' challenge with laser-profile students is deciding whether to accentuate the students' strengths through advanced opportunities to develop their gifts or to bolster their weak areas through remediation so that they can pass the tests. Policy and funding currently favor the second option unless the student is gifted in the traditional academic areas.

Other students have a *searchlight* profile: They show less pronounced differences among intelligences. The challenge with searchlight-profile students is to help them choose a career and life path. Time and resource limitations often preclude developing all intelligences equally, so we need to consider which intelligences are most likely to pay off for a particular student.

Policy and funding currently favor developing primarily linguistic and logical-mathematical intelligences at the expense of the others.

Intelligences are not isolated; they can interact with one another in an individual to yield a variety of outcomes. For example, a successful dancer must combine musical, spatial, and bodily-kinesthetic intelligences; a science fiction novelist must use logical-mathematical, linguistic, interpersonal, and some existential intelligences; an effective trial lawyer must combine linguistic and interpersonal intelligences; a skillful waiter uses linguistic, spatial, interpersonal, and bodily-kinesthetic intelligences; and a marine biologist needs strong naturalistic and logical-mathematical intelligences. In the education setting, the different intelligences can interact in two ways: within the student and across students.

An Internal Orchestra

Just as the sounds of string, woodwind, and percussion instruments combine to create a symphony, the different intelligences intermix within a student to yield meaningful scholastic achievement or other accomplishments. And as in an orchestra, one intelligence (instrument) in an individual can interfere with others, compensate for others, or enhance others.

Interference. Intelligences may not always work in harmony; sometimes they create discord. For example, even a student who has good social skills (strong interpersonal intelligence), may have trouble making friends if she cannot talk with others easily because she has weak linguistic intelligence. Another student who loves to read and receives frequent praise in English class may sit in the back row and bury her head in a novel during math class, where she feels less confident. Thus, her linguistic strength is a bottleneck for the development of her logical-mathematical intelligence. A third student's weakness in intrapersonal intelligence, which makes it difficult for him to regulate his moods or thoughts, may prevent him from completing his math homework consistently and thus mask his strong logical-mathematical intelligence.

Compensation. Sometimes one intelligence compensates for another. A student may give great class presentations because he can effectively use his body posture and gestures even though his sentence structure is somewhat convoluted. That is, his bodily-kinesthetic intelligence compensates for his linguistic limitations. (We can think of more than one U.S. president who fits this profile.) Or a student may earn a high mark on a paper for writing with a powerful rhetorical voice, even though her argument is not quite solid: Her linguistic intelligence compensates for her logical-mathematical limitations.

Enhancement. Finally, one intelligence may jump-start another. Strong spatial intelligence may improve a student's ability to conceptualize a mathematical concept or problem. This was certainly the case with Einstein. Strong musical intelligence may stimulate interest and playfulness in writing poetry. Understanding how intelligences can catalyze one another may help students—and teachers—make decisions about how to deploy the intellectual resources they have at their disposal.

The profile approach to multiple intelligences instruction provides teachers with better diagnostic information to help a particular student who is struggling. Before providing assistance, we need to ask *why* the student is having difficulty. For example, consider three beginning readers who have trouble comprehending a story. The first is struggling because of poor reading comprehension skills (a linguistic intelligence challenge). The second has poor social understanding of the dynamics among the story's characters (an interpersonal intelligence challenge). The third has such strong spatial intelligence that he has trouble seeing beyond the physical pattern of the letter symbols (a challenge that Picasso, for

example, faced in his early years). More reading practice, which is often the default intervention, may not help all of these students.

A student's potential is not the sum of his or her intelligence "scores," as some multiple intelligence inventory measures on the market imply. If one intelligence is a bottleneck for others, then the student's overall potential may be lower than the straight sum. If intelligences are compensating for or enhancing one another, the student's overall potential may be higher than the straight sum. Intelligences have multiplicative as well as additive effects.

An Effective Ensemble

Intelligences can also work across students. The information explosion has greatly escalated the amount of information that each person must assimilate and understand—frequently beyond what we can handle by ourselves. Work teams, institutional partnerships, and interdisciplinary projects have increasingly become the norm. These ensembles support individuals as they seek to learn, understand, and perform well.

Multiple intelligences theory encourages collaboration across students. Students with compatible profiles (exhibiting the same patterns of strengths and weaknesses) can work together to solidify and build on strengths. For example, two students highly capable in storytelling can support each other by moving beyond the basics of plot to explore and develop twists in the narrative. A group of students who are skilled in numerical computation might extend a statistics lesson beyond mean, median, mode, and range to understand correlation or regression.

Students with complementary profiles (in which one student's weak areas are another student's strengths) can work together to compensate for one another. Such students can approach material in different but equally valid ways. For example, a student who is strong in logical-mathematical intelligence and sufficient in spatial intelligence might be able to translate abstract math problems into dance choreography or sculpture contexts to make them understandable to a student with strong spatial and bodily-kinesthetic intelligences.

Provide Rich Experiences

The eminent psychologist L. S. Vygotsky (1978) emphasized that *experience*—the idiosyncratic way each individual internalizes the environment's information—is important in both cognitive and personality development. If we give all students the same material, each student will have a different experience according to his or her background, strengths, and challenges. Thus, to promote learning across student intelligence profiles, teachers need to offer students rich experiences—activities in which they can engage with the material personally rather than just absorb it in an abstract, decontextualized way.

Rich experiences enable students to learn along several dimensions at once—socially, spatially, kinesthetically, self-reflectively, and so on. Often, these experiences cross subject-area lines. At Searsport Elementary School in Searsport, Maine, a 5th grade teacher who had strong storytelling abilities and an avid interest in history joined forces with her colleague, an expert in hands-on science, to develop an archaeology unit. Students studied history and geography as well as scientific method and archaeology techniques. They investigated local history, conducted a state-approved archaeological dig, identified and classified objects, and displayed the artifacts in a museum exhibit that met real-world curatorial standards (Kornhaber, Fierros, & Veenema, 2004).

Rich experiences also provide diagnostic information. Teachers can observe student performances to find root causes of misunderstandings and to figure out how students can achieve superior understandings. One small group of 2nd and 3rd graders in Chimene Brandt's class at Pittsburgh's McCleary Elementary School produced a mural depicting a rainy street scene. Their spatial portrayal of material was ambiguous: The connection to the unit's topic of rivers and the lesson's topic of the water cycle laws was not obvious. The students' understanding came through linguistically, however, when they presented in class how the water from the street would evaporate, condense into clouds, and again produce rain. By giving the students multiple ways to express the concepts, Brandt was able to confirm that the students understood the material even though their linguistic skills outstripped their spatial skills (Kornhaber, Fierros, & Veenema, 2004).

Two programs exemplify how rich experiences can serve as venues for developing and assessing multiple intelligences. The first, Project Spectrum, is an interactive assessment process for preschool children developed in the 1980s at Harvard Project Zero (Gardner, Feldman, & Krechevsky, 1998). This process evaluates each intelligence directly, rather than funneling the information through a linguistic paper-and-pencil test. Spatial orientation and manipulation tasks evaluate spatial intelligence; group tasks evaluate interpersonal intelligence; self-assessments paired with the other assessments evaluate intrapersonal intelligence. Project Spectrum environments do not segment tasks strictly into one intelligence or another. Instead, they set up situations in which a student can interact with rich materials—and teachers can observe these interactions—to see which intelligences come to the fore and which are relegated to the background.

A naturalist's corner provides biological specimens for students to touch and move (using bodily-kinesthetic intelligence), arrange (naturalistic), create relationships among (logical-mathematical), tell stories about (linguistic), or even compare themselves with (intrapersonal). In a storytelling area, students can tell tales (linguistic), arrange props and character figurines (spatial and possibly bodily-kinesthetic), make characters interact (interpersonal), and design their own storyboards (spatial). Fifteen other activities provide opportunities for evaluating intelligences through reliable scoring rubrics that have been used widely in early childhood education in the United States, Latin America, Europe, and Asia (Gardner, Feldman, & Krechevsky, 1998).

Another environment providing rich experiences using a multiple intelligences approach is the Explorama at Danfoss Universe, a science park in Nordborg, Denmark (see www.danfossuniverse.com). Designed according to multiple intelligences theory, this interactive museum is used by people of all ages—from school groups to corporate teams. The designers have devised separate exhibits, games, and challenges for each intelligence and for numerous combinations of intelligences. One experience asks participants to balance themselves (bodily-kinesthetic); another asks them to balance in a group (bodily-kinesthetic and interpersonal). A computer program encourages participants to add, subtract, or combine different musical qualities and see on screen how the tone frequencies change, tapping into musical, spatial, and logical-mathematical intelligences.

Three activities deserve particular attention for their innovativeness in assessing several intelligences concurrently and in emphasizing intelligences that are often neglected in mainstream academic testing. One game involves manipulating a joystick to control a robot that can lift and move a cube to a target space. When played alone, this exhibit primarily assesses bodily-kinesthetic and spatial intelligence. But when two to four people each control a different joystick—one that controls the left wheel of the robot, another that controls the right wheel, another that raises the cube, and another that lowers the cube—they must

coordinate their play to accomplish the task, employing linguistic, logical-mathematical, and interpersonal intelligences.

Another game has two players sitting opposite each other at a table, with a ping-pong ball in the center. Each player tries to move the ball toward the opponent by relaxing. Relaxing reduces the player's stress level, creating alpha waves in the brain that sensors pick up to move the ball forward. This task requires self-control, and thus taps into intrapersonal intelligence. However, the players must also employ interpersonal intelligence, paying attention to each other and trying to produce more alpha waves than the opponent does.

A third notable Explorama activity is a computerized questionnaire in which participants assess their own intelligence profiles. Participants take the self-assessment before entering the Explorama and again after they have engaged in the various activities and tasks. Participants thus get an idea of how well they know their own capabilities. They also can compare their self-assessments before and after the Explorama experience to learn whether their self-perceptions stayed constant or changed. This process develops participants' intrapersonal intelligence.

Get Personal

The orientation toward profiles, interactions, and experience emphasizes a need to develop, in particular, the two personal intelligences.

Intrapersonal intelligence involves knowing yourself—your talents, energy level, interests, and so on. Students who strengthen their intrapersonal intelligence gain a better understanding of areas in which they can expect to excel, which helps them plan and govern their own learning.

Interpersonal intelligence involves understanding others through social interaction, emotional reactions, conversation, and so on. An individual's interpersonal intelligence affects his or her ability to work in groups. Group projects can create environments for students to improve their interpersonal intelligence as they develop other skills and knowledge.

Donna Schneider, a 3rd grade teacher at the John F. Kennedy Elementary School in Brewster, New York, developed a real-world publishing company in her classroom: "Schneider's Ink." Each spring when the school puts on performances and events, Schneider's 3rd graders create programs, banners, advertisements, and other publicity materials for their clients, the sponsoring teachers. Each student assumes a different job—editor, sales manager, typist, accountant, customer service representative, or designer. Before taking on a given position, each student writes a resumé and cover letter, obtains letters of recommendation, and is interviewed by the teacher. Students explore their own strengths and become aware of how those strengths can enable them to succeed in various jobs.

Schneider's Ink also engages students' interpersonal intelligence. For example, the quality-control manager, who is responsible for handling customer complaints, has to work with both clients and the editor to review problems. As company employees, the students juggle simultaneous print orders, coordinating the sequencing of tasks among themselves to produce high-quality work on time. They must understand others through social interaction, emotional reactions, and conversation. Through this process, students acquire a better understanding of the interdependence of individual strengths (Kornhaber, Fierros, & Veenema, 2004).

Building Active Learners

The multiple intelligences approach does not require a teacher to design a lesson in nine different ways so that all students can access the material. Rather, it involves creating rich

experiences in which students with different intelligence profiles can interact with the materials and ideas using their particular combinations of strengths and weaknesses.

Often, these experiences are collaborative. As the amount of information that students—and adults—must process continues to increase dramatically, collaboration enables students to learn more by tapping into others' strengths as well as into their own. In ideal multiple intelligences instruction, rich experiences and collaboration provide a context for students to become aware of their own intelligence profiles, to develop self-regulation, and to participate more actively in their own learning.

Gardner's Multiple Intelligences

Linguistic. Ability to understand and use spoken and written communication. Ideal vocation: poet.

Logical-mathematical. Ability to understand and use logic and numerical symbols and operations. Ideal vocation: computer programmer.

Musical. Ability to understand and use such concepts as rhythm, pitch, melody, and harmony. Ideal vocation: composer.

Spatial. Ability to orient and manipulate three-dimensional space. Ideal vocation: architect.

Bodily-kinesthetic. Ability to coordinate physical movement. Ideal vocation: athlete.

Naturalistic. Ability to distinguish and categorize objects or phenomena in nature. Ideal vocation: zoologist.

Interpersonal. Ability to understand and interact well with other people. Ideal vocation: politician; salesperson.

Intrapersonal. Ability to understand and use one's thoughts, feelings, preferences, and interests. Ideal vocation: autobiographer; entrepreneur. (Although high intrapersonal intelligence should help in almost any job because of its role in self-regulation, few paid positions reward a person solely for knowing himself or herself well.)

Existential. Ability to contemplate phenomena or questions beyond sensory data, such as the infinite and infinitesimal. Ideal vocation: cosmologist; philosopher.

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