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Using Multiple Intelligences in Testing and Assessment

Although Howard Gardner's theory of multiple intelligences (MI) is over a decade old, teachers are still trying to find the best way to use this theory to assess students with different styles of learning and varied academic strengths. Multiple Intelligences shape the way students understand, process, and use information.

Gardner groups student capabilities into eight broad categories (each student's unique learning style is a combination of these intelligences):

- **Logical/mathematical** (uses numbers effectively)
- **Visual/spatial** (is artistically or spatially perceptive)
- **Bodily/kinesthetic** (excels at tasks that require physical movement)
- **Musical** (perceives and/or expresses musical forms and patterns)
- **Linguistic** (uses words effectively)
- **Interpersonal** (responds well to others)
- **Intrapersonal** (is reflective and inner-directed)
- **Naturalist** (makes distinctions in the natural world)

Since no single approach to teaching and assessment can possibly work best for every student, teachers face a challenge. What's the best way to match assessments to students' learning styles?

Assessing Multiple Intelligences
Of course, assessment should reflect the diversity of intelligences and learning styles in your classroom. For example, students who are good at spatial learning might not display the full range of their knowledge on an essay test. In fact, traditional testing methods are inherently biased in favor of students with strong linguistic and mathematical skills. Advocates of MI theory suggest that teachers supplement their traditional assessment methods with assessment strategies that evaluate student progress in an inclusive, meaningful way.

So, how can you use the theory of multiple intelligences to assess student achievement in your classroom? The MI approach to testing is closely related to authentic assessment. This approach enables students to demonstrate the depth of their understanding, connect their classwork to real-life experiences, and apply their knowledge to new situations.

MI theorists offer the following tips:

- Emphasize ongoing assessment and progress. Continue to ask if and how students have improved their skills.
- Introduce assessment to your students as a regular part of classroom life. Make assessment a part of the learning process, not a stressful, intimidating "event."
- Try to use instruments, tools, and procedures that embrace some, if not all, of the multiple intelligences.
- Use a wide range of assessment tools to measure students' skills and abilities.
- Give lots of feedback!

Build Your Own Assessment Repertoire

To create successful assessment strategies, familiarize yourself with your students' individual learning styles. Knowing how your students learn best can help you choose approaches that will reach them most effectively. Here are some specific strategies that can make assessment productive and fun:

Linguistic

- Ask students to write in a journal regularly.
- Give oral exams and/or essay tests.
- Emphasize creative writing – have students write poems, plays, and stories.

Logical/Mathematical

- Assign science labs and experiments.
- Have students complete logic problems and games.

Bodily/Kinesthetic

- Challenge students to write and perform plays.
- Have students build models or use other hands-on techniques to show what they learned.

Visual/Spatial

- Invite students to create collages, murals, and posters.
- Encourage students to illustrate their ideas using maps, charts, and graphs.
- Help students use school equipment to make a video or slide show.

Interpersonal

- Stage a classroom debate.
- Have students work collaboratively to brainstorm and prepare a project.

Intrapersonal

- Ask students to identify their own academic strengths and weaknesses.
- Have students think of personal goals and give progress reports.

Musical

- Challenge students to identify and explain patterns in music or poetry.
- Ask students to write new lyrics to familiar melodies or to compose a new song.

Naturalist

- Ask students to keep environmental journals and to share their observations.
- Invite students to lead classmates on a nature walk to point out interesting plants and animals they found during independent study.

Note that many of these assessment strategies evaluate more than one kind of intelligence. You can use strategies like these and other combinations of projects, performances, and portfolios to assess students' progress.

There is no "right" way to use multiple intelligences in testing and assessment. You don't have to overhaul your whole curriculum. But you can make an effort to address each student's strengths and weaknesses by using creative alternatives to traditional testing in your classroom.

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Multiple Intelligences Activities

At a glance:

Logical/mathematical (analytical, concept-oriented)
Visual/spatial (image, picture-oriented)
Naturalist (enjoys organizing natural patterns)
Bodily/kinesthetic (excels at physical movement, both gross and fine motor)
Musical/rhythmic (oriented to tonal and rhythmic patterns)
Interpersonal (good person-to-person skills)
Intrapersonal (inner-directed, reflective)
Verbal/linguistic (oriented to words, language)

Activities

Logical/mathematical: Enjoys working with numbers, doing experiments

Teaching tip: Use "science thinking": Ask students to identify scientific principles in areas other than science.
Fun activity (grades 4-6): Find three random things (for example, a blade of grass, the word "long," and the process "jumping") and ask your students to invent an object that uses all three.
Fun activity (grades 6-8): Ask students to reinvent or improve upon the designs of everyday objects.

Visual/spatial: Enjoys drawing and painting

Teaching tip: Use colors as visual cues: Use a variety of colors of chalk and markers when writing in front of the class. Students can use different colored markers to "color code" materials they are studying.
Fun activity (grades 4-6): Draw an unusual shape and have each student include it in a drawing of his or her own.
Fun activity (grades 6-8): Play drawing games such as *Pictionary* or *Win, Lose or Draw*. Have students make rapid drawings to capture key points being discussed in a class lesson.

Naturalist: Enjoys studying things in nature, such as rocks, dinosaurs, insects, plants

Teaching tip: Noticing patterns: Encourage students to form their own systems for sorting and categorizing information.
Fun activity (grades 4-6): Show pictures of various animals or plants and ask students to figure out what they have in common.
Fun activity (grades 6-8): Given certain basic guiding principles, ask students to describe an animal, ecosystem, or other natural entity. To stimulate creativity, the entity need not exist at present, but should be theoretically imaginable.

Bodily/kinesthetic: Enjoys dancing, crafts, or sports

Teaching tip: Classroom theater: Students can act out the material to be learned through role-playing.
Fun activity (grades 4-6): Ask students what they like to eat for lunch – and have them act out the answers in a game of charades.
Fun activity (grades 6-8): Use the human body as a "map" for learning new information in different subjects. In geography, for example, the body might represent Europe. If the head is Scandanavia, then where is Italy?

Musical/Rhythmic: Enjoys listening to music

Teaching tip: Create discographies: Supplement bibliographies with lists of recorded music relating to class material. Also, as part of a homework assignment, have students select music that best demonstrates lesson themes.
Fun activity (grades 4-6): Play unusual or difficult-to-recognize sounds and ask students to imagine what they might be.
Fun activity (grades 6-8): Some students can more easily memorize information if they listen to a teacher's lesson against a musical background. Baroque and classical music can be particularly effective.

Interpersonal: Enjoys giving advice to friends who have problems

Teaching tip: Peer sharing: Set up a class "buddy system" so students can share and develop ideas with the same person over a period of time.
Fun activity (grades 4-6): Make learning a fun and cooperative effort with class-made board games. Using file folders, markers, dice, and small game pieces, the information to be learned can be placed on squares of a winding road or on separate cards.
Fun activity (grades 6-8): Ask students to think of the results of unlikely events. For example, "What if all of us could feel each other's feelings?"

Intrapersonal: Enjoys being by himself and thinking

Teaching tip: Personal connections: To make learning more directly relevant, make connections between class material and students' lives. To spark discussion, ask: "How many of you have ever..." Or "Can you tell about a time when you..."
Fun activity (grades 4-6): Start individual or class scrapbooks for remembering special events.
Fun activity (grades 6-8): Provide opportunities for setting goals and charting progress toward these goals. Goals may be short-term ("List three things you'd like to learn today") or long-term ("What do you want to be doing ten years from now?").

Verbal/linguistic: Enjoys storytelling, reading books

Teaching tip: Tape recording: To help students clarify their thinking, have them use a tape recorder to talk out loud about a problem or project. Recordings can also be used as a writing tool.
Fun activity (grades 4-6): Have students think of as many things as possible that share a certain property, such as things that are round (sun, balloons, a squashed soda can), and encourage creative answers.
Fun activity (grades 6-8): Invent nicknames for well-known people that capture features that make the individuals unique.

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Multiple Intelligences: Gardner's Theory.

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(revised 11/99 by the editors to include Howard Gardner's eighth intelligence)

Arguing that "*reason, intelligence, logic, knowledge are not synonymous...*," Howard Gardner (1983) proposed a new view of intelligence that is rapidly being incorporated in school curricula. In his *Theory of Multiple Intelligences*, Gardner expanded the concept of intelligence to also include such areas as music, spacial relations, and interpersonal knowledge in addition to mathematical and linguistic ability.

This article discusses the origins of Gardner's Theory of Multiple Intelligences, his definition of intelligence, the incorporation of the Theory of Multiple Intelligences into the classroom, and its role in alternative assessment practices.

EIGHT INTELLIGENCES

Gardner defines intelligence as "the capacity to solve problems or to fashion products that are valued in one or more cultural setting" (Gardner & Hatch, 1989). Using biological as well as cultural research, he formulated a list of seven intelligences. This new outlook on intelligence differs greatly from the traditional view which usually recognizes only two intelligences, verbal and computational. The eight intelligences Gardner defines are:

Logical-Mathematical Intelligence--consists of the ability to detect patterns, reason deductively and think logically. This intelligence is most often associated with scientific and mathematical thinking.

Linguistic Intelligence--involves having a mastery of language. This intelligence includes the ability to effectively manipulate language to express oneself

rhetorically or poetically. It also allows one to use language as a means to remember information.

Spatial Intelligence--gives one the ability to manipulate and create mental images in order to solve problems. This intelligence is not limited to visual domains--Gardner notes that spatial intelligence is also formed in blind children.

Musical Intelligence--encompasses the capability to recognize and compose musical pitches, tones, and rhythms. (Auditory functions are required for a person to develop this intelligence in relation to pitch and tone, but it is not needed for the knowledge of rhythm.)

Bodily-Kinesthetic Intelligence--is the ability to use one's mental abilities to coordinate one's own bodily movements. This intelligence challenges the popular belief that mental and physical activity are unrelated.

The Personal Intelligences--includes **interpersonal feelings** and intentions of others--and **intrapersonal intelligence**--the ability to understand one's own feelings and motivations. These two intelligences are separate from each other. Nevertheless, because of their close association in most cultures, they are often linked together.

Naturalist intelligence designates the human ability to discriminate among living things (plants, animals) as well as sensitivity to other features of the natural world (clouds, rock configurations).

Although the intelligences are anatomically separated from each other, Gardner claims that the eight intelligences very rarely operate independently. Rather, the intelligences are used concurrently and typically complement each other as individuals develop skills or solve problems. For example, a dancer can excel in his art only if he has

1. strong musical intelligence to understand the rhythm and variations of the music,
2. interpersonal intelligence to understand how he can inspire or emotionally move his audience through his movements, as well as
3. bodily-kinesthetic intelligence to provide him with the agility and coordination to complete the movements successfully.

BASIS FOR INTELLIGENCE

Gardner argues that there is both a biological and cultural basis for the multiple intelligences. Neurobiological research indicates that learning is an outcome of the modifications in the synaptic connections between cells. Primary elements of different types of learning are found in particular areas of the brain where

corresponding transformations have occurred. Thus, various types of learning results in synaptic connections in different areas of the brain. For example, injury to the Broca's area of the brain will result in the loss of one's ability to verbally communicate using proper syntax. Nevertheless, this injury will not remove the patient's understanding of correct grammar and word usage.

In addition to biology, Gardner (1983) argues that culture also plays a large role in the development of the intelligences. All societies value different types of intelligences. The cultural value placed upon the ability to perform certain tasks provides the motivation to become skilled in those areas. Thus, while particular intelligences might be highly evolved in many people of one culture, those same intelligences might not be as developed in the individuals of another.

USING MULTIPLE INTELLIGENCES IN THE CLASSROOM

Accepting Gardner's Theory of Multiple Intelligences has several implications for teachers in terms of classroom instruction. The theory states that all seven intelligences are needed to productively function in society. Teachers, therefore, should think of all intelligences as equally important. This is in great contrast to traditional education systems which typically place a strong emphasis on the development and use of verbal and mathematical intelligences. Thus, the Theory of Multiple Intelligences implies that educators should recognize and teach to a broader range of talents and skills.

Another implication is that teachers should structure the presentation of material in a style which engages most or all of the intelligences. For example, when teaching about the revolutionary war, a teacher can show students battle maps, play revolutionary war songs, organize a role play of the signing of the Declaration of Independence, and have the students read a novel about life during that period. This kind of presentation not only excites students about learning, but it also allows a teacher to reinforce the same material in a variety of ways. By activating a wide assortment of intelligences, teaching in this manner can facilitate a deeper understanding of the subject material.

Everyone is born possessing the seven intelligences. Nevertheless, all students will come into the classroom with different sets of developed intelligences. This means that each child will have his own unique set of intellectual strengths and weaknesses. These sets determine how easy (or difficult) it is for a student to learn information when it is presented in a particular manner. This is commonly referred to as a learning style. Many learning styles can be found within one classroom. Therefore, it is impossible, as well as impractical, for a teacher to accommodate every lesson to all of the learning styles found within the classroom. Nevertheless the teacher can show students how to use their more developed intelligences to assist in the understanding of a subject which normally employs their weaker intelligences (Lazear, 1992). For example, the teacher can suggest that an especially

musically intelligent child learn about the revolutionary war by making up a song about what happened.

TOWARDS A MORE AUTHENTIC ASSESSMENT

As the education system has stressed the importance of developing mathematical and linguistic intelligences, it often bases student success only on the measured skills in those two intelligences. Supporters of Gardner's Theory of Multiple Intelligences believe that this emphasis is unfair. Children whose musical intelligences are highly developed, for example, may be overlooked for gifted programs or may be placed in a special education class because they do not have the required math or language scores. Teachers must seek to assess their students' learning in ways which will give an accurate overview of the their strengths and weaknesses.

As children do not learn in the same way, they cannot be assessed in a uniform fashion. Therefore, it is important that a teacher create an "intelligence profiles" for each student. Knowing how each student learns will allow the teacher to properly assess the child's progress (Lazear, 1992). This individualized evaluation practice will allow a teacher to make more informed decisions on what to teach and how to present information.

Traditional tests (e.g., multiple choice, short answer, essay...) require students to show their knowledge in a predetermined manner. Supporters of Gardner's theory claim that a better approach to assessment is to allow students to explain the material in their own ways using the different intelligences. Preferred assessment methods include student portfolios, independent projects, student journals, and assigning creative tasks. An excellent source for a more in-depth discussion on these different evaluation practices is Lazear (1992).

CONCLUSION

Schools have often sought to help students develop a sense of accomplishment and self-confidence. Gardner's Theory of Multiple Intelligences provides a theoretical foundation for recognizing the different abilities and talents of students. This theory acknowledges that while all students may not be verbally or mathematically gifted, children may have an expertise in other areas, such as music, spatial relations, or interpersonal knowledge. Approaching and assessing learning in this manner allows a wider range of students to successfully participate in classroom learning.

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