

Applying Multiple Intelligences in the Classroom: A Fresh Look at Teaching Writing

Fred C. Lunenburg
Sam Houston State University

Melody R. Lunenburg
Willis ISD, Texas

Abstract

The theory of multiple intelligences is a theory of intelligence that differentiates it into specific modalities, rather than seeing intelligence as dominated by a single general ability, often called a “g factor.” Howard Gardner has identified nine distinct intelligences. According to Gardner, students possess all nine intelligences. Where students differ is in the strength of these intelligences. Gardner claims that these differences challenge an educational system that assumes everyone can learn the same subject matter in the same way and that a uniform measure can be used to test student learning. Our educational system is heavily biased toward linguistic modes of instruction and assessment and, to a somewhat lesser extent, toward logical-mathematical modalities as well. Not all learners possess equally strong linguistic intelligence. This intelligence may be more challenging for some learners and, therefore, writing may be more difficult for them. In this article, we incorporate Gardner’s multiple intelligences to help improve one discipline, writing instruction.

The field of brain research has produced a plethora of new information that has implications for how children learn and how teachers teach. The work of researchers (Caine & Caine, 2001; Diamond & Hopson, 1999; Jensen, 2005; Sylwester, 2004; Zadina, 2014) offers knowledge for application in the classroom. Howard Gardner’s (1983, 1993, 1999a, 1999b, 1999c, 2004, 2008, 2011) work with multiple intelligences coincides with the latest brain research and offers insights for writing teachers. When writing teachers use students’ multiple intelligences, students’ writing has the potential to improve as does their enthusiasm for writing.

What do we mean by intelligence? When most people speak about intelligence, they are generally referring to cognitive ability, “intelligence quotient”, or IQ. More than a century ago, Alfred Binet developed a written test to measure the IQ of elementary school children in France. Later the U.S. Armed Forces began using the test with recruits in World War I. Subsequently, it was used widely in schools and businesses to classify students and select employees, respectively. The Binet IQ Test (Stanford-Binet IQ Test) basically measured two traditional cognitive ability dimensions: verbal/linguistic and mathematical/logical, which were thought to determine intelligence.

Traditionally linguistic intelligence and logical-mathematical intelligence have been identified and highly valued in education and learning environments. These two intelligences drive academic testing and the measurement of IQ. They are the basis of many standardized

academic tests such as the National Assessment of Educational Progress (NAEP), Iowa Test of Basic Skills (ITBS), and norm-referenced state mastery tests. Popular college admission tests, such as the SAT and ACT and graduate admission tests in medicine MCAT, law LSAT, business GMAT, and education (GRE) measure such general intellectual abilities. While these two intelligences are important to our ability to learn, they are not all inclusive (Bartholomew, 2004).

On the one hand, some scientists and educators believe that people possess a single intelligence (often called a “g factor”) or that all knowledge can be written in propositional language and measured by short-answer test questions. On the other hand, cognitive pluralists expand our traditional notions of knowledge and intelligence. They believe that people possess numerous intelligences and that knowledge exists in many forms of representation (Eisner, 1992). Cognitive pluralists suggest that students should be able to learn through a variety of forms of representation (e.g. narratives, poetry, film, pictures) and be able to express themselves through a variety of forms as well. This means that most tests, reflective of traditional education practices in the form of short answer questions, are too limiting. Some students may better express themselves through painting, music, or poetry.

One may think of cognitive pluralism then from the perspective of intelligence. Some scholars may think of intelligence as multiple rather than singular. Howard Gardner, a leading advocate of this viewpoint (1983), argues that, according to his own research and reviews of a wide variety of studies, a theory of multiple intelligences is more viable than a theory about a “g factor.”

The Theory of Multiple Intelligences

Based on his study of many people from different walks of life in everyday circumstances and professions, Howard Gardner (1983, 1993, 1999a) developed the theory of multiple intelligences. He performed interviews with and brain research on hundreds of people, including stroke victims, prodigies autistic individuals, and so-called “idiot savants.” Gardner claims that all human beings have multiple intelligences in varying amounts. Each person has a different intellectual profile. These intelligences are located in different parts of the brain and can either work independently or together. These intelligences can be nurtured and strengthened, or ignored and weakened. According to Gardner, we can improve education by addressing the multiple intelligences of our students.

Gardner (1999a) identifies not two, but nine different intelligences: linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal, naturalist, and existential. Gardner defined the first seven intelligences in *Frames of Mind* (1983). He added the last two in *Intelligence Reframed* (1999). According to Gardner (1999a), intelligence is (a) the ability to create an effective product or offer a service that is valued in a culture, (b) a set of skills that make it possible for a person to solve problems in life, and (c) the potential for finding or creating solutions for problems, which involves gathering new knowledge.

Linguistic Intelligence

Linguistic intelligence refers to an individual’s sensitivity to the sounds, rhythms, and meanings of words; and sensitivity to different functions of language. Everyone is thought to possess this intelligence at some level. Poets, authors, orators, speakers, and attorneys exhibit strong linguistic intelligence. Traditionally linguistic intelligence and logical-mathematical

intelligence have been identified and highly valued in education and learning environments. Teachers can enhance their students' linguistic intelligence by having them say and see words, read books together, and by encouraging discussion. Tools include computers, word games, multimedia, books, tape recorders, and lecture. Some examples of people who are gifted with this intelligence are J.K. Rowling, Maya Angelou, and Martin Luther King, Jr. Most of our traditional ways of teaching draw on linguistic intelligence. Writing teachers can extend traditional ways of teaching through linguistic intelligence by:

- Doing oral activities before writing—storytelling, discussing, interviewing
- Reading to get ideas for writing
- Connecting literature study and writing
- Completing crossword puzzles with vocabulary words
- Playing games like Scrabble, Scrabble, Jr., or Boggle
- Using digital resources such as electronic libraries, desktop publishing, and word processing. (Bratcher, 2012, pp. 31-32)

Logical-Mathematical Intelligence

Logical-mathematical intelligence refers to an individual's sensitivity to, and capacity to discern, logical or numerical patterns; and ability to handle long chains of reasoning. These individuals like to experiment, solve puzzles, and ask cosmic questions. Strength in logical-mathematical intelligence often implies great scientific ability. Teachers can strengthen this intelligence by encouraging the use of computer programming languages, critical-thinking activities, linear outlining, science-fiction scenarios, logic puzzles, and through the use of logical-sequential presentation of subject matter. Some examples of people who are gifted with this intelligence are Albert Einstein, Isaac Newton, and Gary Larson. Writing teachers can draw on this intelligence to teach writing by:

- Teaching outlining
- Looking at the writing process as a logical progression of tasks
- Offering cause-effect and relationship scenarios as prompts for writing
- Teaching grammar rules and sentence diagramming
- Designing alphabetic and numeric codes
- Searching for patterns in the classroom, school, outdoors, and home. (Bratcher, 2012, p. 32)

Spatial Intelligence

Spatial intelligence refers to capacities to perceive the visual-spatial world accurately and to perform transformations on one's initial perceptions. These individuals like to draw, do jigsaw puzzles, read maps, and daydream. Teachers can foster this intelligence through drawings and verbal and physical imagery. Tools include models, graphics, charts, photographs, drawings, 3-D modeling, video, videoconferencing, television, multimedia, texts with pictures/charts/graphs, microscopes, computer graphics software. Some people gifted with spatial intelligence are Pablo

Picasso, Bobby Fischer, and Georgia O'Keefe. Writing teachers can draw on this intelligence to teach writing by:

- Using diagrams to teach writing concepts: triangles, clusters, webs, maps
- Using pictures as prompts for writing
- Encouraging students to include drawings and pictures with their writing
- Using color coding for mechanical errors
- Doing imagination exercises before writing
- Illustrating poems for the class poetry book by drawing or using computer software. (Bratcher, 2012, pp. 32-33)

Bodily-Kinesthetic Intelligence

Bodily-kinesthetic intelligence refers to abilities to control one's body movements and to handle objects skillfully, like a dancer or a surgeon. These individuals like movement, making things, touching. Teachers may encourage growth in this area of intelligence through physical activity, hands-on learning, acting out, role playing, and physical relaxation exercises. Tools include equipment and real objects. Some examples of people who are gifted with this intelligence are LeBron James, Serena Williams, and Mia Hamm. Writing teachers can draw on this intelligence to teach writing by:

- Acting out stories before writing them
- Writing plays that include stage directions
- Playing charades with vocabulary words
- Encouraging students to do projects to accompany their writing
- Building objects using blocks, cubes, or Legos to represent writing concepts
- Using electronic motion-simulation games and hands-on construction kits to teach writing. (Bratcher, 2012, p. 32)

Musical Intelligence

Musical intelligence refers to the abilities to produce and appreciate rhythm, pitch, and forms of musical timbre; and appreciation of the forms of musical expressiveness. These individuals may study better with music in the background. Teachers can integrate activities into their lessons that encourage students' musical intelligence by turning lessons into lyrics, speaking rhythmically, and tapping out time. Tools include musical instruments, music, radio, stereo, CD-ROM, and multimedia. Some examples of people who are gifted with musical intelligence are Wolfgang Amadeus Mozart, Louis Armstrong, and Lauryn Hill. According to Bratcher (2012, pp. 31-32), writing teachers can draw on musical intelligence to teach writing by:

- Reciting poetry aloud and clapping to accentuate the rhythm of the words
- Singing folk songs and having students write new verses
- Creating readers' theatre with writing

- Listening to wraps and having students write their own
- Writing their own songs and music
- Listening to CDs that teach writing concepts (e.g., parts of speech, sentence structure, etc.).

Interpersonal Intelligence

Interpersonal intelligence is the capacity to discern and respond appropriately to the moods, temperaments, motivations, desires of other people. These individuals learn through interaction. They have many friends and empathy for others. Teachers can encourage the growth of interpersonal intelligence by designing lessons that include group activities, seminars, and dialogues. Tools include the telephone, audio conferencing, time and attention from the teacher, video conferencing, writing, computer conferencing, and email. Some examples of people with this intelligence are Gandhi, Ronald Reagan, and Oprah Winfrey. Writing teachers can draw on this intelligence to teach writing by:

- Working with cooperative learning groups to design and complete writing projects
- Using peer groups for brainstorming, revising, and editing
- Connecting writing activities to the community outside the school
- Inviting guests to the classroom to tell stories or to talk about writing
- Tutoring young students or classmates on the processes of writing
- Using puppets to teach writing lessons. (Bratcher, 2012, p. 33)

Intrapersonal Intelligence

Intrapersonal intelligence is access to one's own feelings and the ability to discriminate among them and draw upon knowledge of one's strengths and weaknesses, desires, and intelligences. Teachers can encourage growth of intrapersonal intelligence by assigning reflective activities, such as journal writing and independent study. Tools include books, creative materials, diaries, privacy and time. Examples of individuals who exhibited strong intrapersonal intelligence in their lifetimes are authors of classic autobiographies such as Mark Twain, Jean Paul Satre, and Frederick Douglas. Writing teachers can draw on intrapersonal intelligence to teach writing by:

- Having students keep personal journals
- Having students choose their best writing pieces for portfolios
- Allowing time for self-reflection about writing
- Using life maps and personal topics as springboards for writing
- Writing essays from the perspective of famous literary figures
- Using software that allows students to work alone, such as Decisions or the Perfect Career. (Bratcher, 2012, p. 33)

Naturalist Intelligence

Naturalist intelligence is the ability to understand, relate to, categorize, classify, comprehend, and explain the things encountered in the world of nature. Teachers can enhance this intelligence by having students differentiate among living things (plants, animals), demonstrate sensitivity to the natural world (clouds, rock configurations) through the study of relationships such as pattern recognition and comparison and contrast and connections to real life and science issues. Examples of people gifted in naturalist intelligence are Charles Darwin, John Muir, and Jane Goodall. Writing teachers can draw on naturalist intelligence by:

- Caring for classroom plants based on best practices research
- Adding a new animal to the class menagerie
- Sorting and classifying natural objects, such as plants and rocks
- Researching animal habitats and writing essays on the topic
- Observing natural surroundings in preparation to writing
- Participating in park/playground clean-ups, recycling drives, and beautification projects. (Bratcher, 2012, pp. 33-34)

Existential Intelligence

Existential intelligence is the ability to pose and ponder questions regarding existence—including life and death. This would be in the domain of philosophers and religious leaders. Students favoring this intelligence tend to be the ones who must put everything into a larger framework, a global perspective, a historical context. They ask the “why?” questions. They have a tendency to be so focused on the big picture that they often lose sight of necessary details. The ninth intelligence has not yet been fully accepted by educators in the classroom (Giles, Pitre, & Womack, 2003). The hypothesis has been further explored by educational researchers (Tupper, 2002). Some examples of people with existential intelligence are Dalai Lama, Mother Teresa, and Confucius.

Applying Multiple Intelligences Theory in Your Classroom

Since we know that all of our students have each of Howard Gardner’s multiple intelligences and that these guide the way students learn and process information, it makes sense to address as many of these intelligences in our classrooms as possible. What we may not know is how to apply a multiple intelligences approach to learning in the classroom.

By using the multiple intelligences approach in your classroom, you will provide opportunities for authentic learning based on your students’ needs, interests, and talents. The multiple intelligences classroom acts like the “real” world. For example, the author and the illustrator of a book or the actor and the set builder in a play are equally valuable creators. Students become more active, involved learners. You and the students come to view intellectual ability more broadly. Drawing a picture, composing or listening to music, sculpting an object, watching a performance—these activities can be vital learning experiences.

There are many ways to apply multiple intelligences theory in the classroom (Educational Broadcasting Corporation, 2004a). Students in history classes study periodic music and art.

Students in science classes incorporate visual, musical, and bodily-kinesthetic experiences. Students in English classes who are studying English and world literature visit museums, art galleries, and historic sites.

At all levels of education, teachers explore more effective methods of assessment which encourage their students to demonstrate understanding through multiple intelligences. Elementary students compose and perform songs about grammar concepts. Middle school students create multimedia presentations combining animations, compositions, and writing to accommodate interdisciplinary units. High school students demonstrate mastery of self-developed research questions through art, writing portfolios, and delivering presentations to education stakeholders. During a writing unit, cooperative learning groups help edit other students' essays.

The ultimate goal of multiple intelligences theory is to increase student understanding of subject matter. Classroom activities often activate more than one of the multiple intelligences. For example, consider the following classroom activities:

- Writing a report or essay—activates linguistic intelligence
- Composing a song—promotes musical and linguistic intelligences
- Group discussion—activates linguistic and interpersonal intelligences
- Journal writing—enhances intrapersonal and linguistic intelligences
- Making a video—stimulates logical-mathematical, musical, linguistic, interpersonal, and spatial intelligences
- Choreography—integrates musical, linguistic, and interpersonal intelligences
- Composing a song—serves musical and linguistic intelligences
- Communicating with experts online—engages linguistic and interpersonal intelligences
- Making graphs—activates logical-mathematical and spatial intelligences
- Putting on a play—enhances musical, linguistic, interpersonal, and spatial intelligences
- Designing posters—integrates linguistic and spatial intelligences
- Constructing timelines—promotes logical-mathematical and spatial intelligences
- Hands-on experimentation—nurtures kinesthetic and logical-mathematical intelligences. (Educational Broadcasting Corporation, 2004a, pp. 4-6)

Strategies for Applying Multiple Intelligences in the Classroom

Writing is a creative expression of real or imagined sensory experiences. A sensorimotor and cognitive process, writing serves all of Howard Gardner's multiple intelligences, not just linguistic intelligence (Hanson, 2009). For example, writing activates logical-mathematical intelligence when scientists write proofs to theories; spatial intelligence when architects write blueprints of their structures; bodily-kinesthetic intelligence when coaches write strategic plays their athletes execute; musical intelligence when maestros share their genius through their written composition; interpersonal intelligence when student groups help to edit essays of other students; intrapersonal intelligence when students reflect on a written piece; naturalist intelligence when humans demonstrate sensitivity to the natural world (plants, animals, clouds,

rock configurations) existential intelligence when religious leaders and philosophers study the meaning of life. Four strategies for applying multiple intelligences in the classroom include: “ (a) collaborating with other teachers, (b) providing students with various presentation options, (c) incorporating multiple intelligences in cooperative learning groups, and (d) involving education stakeholders and guest speakers” (Educational Broadcasting Corporation, 2004a, pp. 4-5).

Collaborating with Other Teachers

As a writing teacher, you might collaborate with a colleague who is also interested in multiple intelligences. Together you can brainstorm possible ways to teach the same or complementary subject matter. For example, instead of lecturing to students about grammatical rules, you may collaborate with a physical education teacher and invent a game where students are verbs, nouns, adjectives, etc., and teams only can constitute complete sentences. You can do the same with paragraphs and topic sentences (with topic sentences being designated team captain).

Providing Students with Various Presentation Options

In addition to writing essays, you can encourage students to demonstrate what they know by giving oral presentations accompanied by visual aids they create to organize the information. Other presentation options include role playing exercises, plays, debates, murals, Web publishing, and multimedia computer presentations.

Incorporating Multiple Intelligences in Cooperative Learning Groups

To help students develop “interpersonal intelligence,” you can use cooperative learning groups. After determining some of your students’ multiple intelligences, organize cooperative learning groups so there is an interesting distribution in each group. Students with strong interpersonal skill frequently make excellent theatrical directors, while those with strong visual intelligence enjoy painting lively sets. Have the naturalist and interpersonal specialists in the group collaborate to plan a nature walk.

Involving Education Stakeholders and Guest Speakers

You can develop a panel of education stakeholders to review your students’ multiple intelligences demonstrations of understanding. Invite experts into the classroom to embellish lessons on writing. For example, when teaching writing concepts, invite an author who is writing/has written a book to discuss how he/she uses writing concepts in his/her writing. Motivate students by taking them on field trips to local businesses (e.g., newspaper offices, restaurants, theater companies, museums, radio and TV stations, music studios, bookstores with a focus on written material to see how subject matter studied in class can apply to the real world.

Assessment

Students must have a clear understanding of how their work will be evaluated. Provide the objectives and expectations of your lesson before beginning to teach. There are many ways to assess students understanding. Begin by developing rubrics (Hampton, Murphy, & Lowry, 2009). The student must know at the beginning of a lesson how his or her demonstration of understanding will be assessed.

Assessment becomes more complicated when applying multiple intelligences theory (Educational Broadcasting Corporation, 2004a). For example, if the writing assignment requires an illustration, then evaluation will likely include assessment of not only the writing but also the illustration. One student may produce brilliant writing and inadequate illustration while another student may illustrate well and write poorly. Also, if the criteria established to evaluate a piece of writing does not contain a standard for assessing mechanics (e.g. spelling, punctuation, capitalization, etc.) then poor mechanics should not have an impact on the assessment.

There are several ways to address this type of dilemma according to the Educational Broadcasting Corporation,

(a) develop methods of assessment that do not indicate one intelligence as more valuable than another. These may include rubrics—informing students at the beginning the criteria for weighting different parts of the assignment; (b) provide students with concrete examples of completed projects before they begin their assignments. Exhibit both an example of the minimum expected and an example of an exemplary project, against which students can measure their own achievement, (c) permit flexibility and feedback during the process. Provide additional time, either during class time or after school for students to work on their projects, and (d) engage students in the process. (2004a, pp. 8-9)

Some rubrics may include peer evaluation. Some classes in the upper grades may contain student panels to review demonstrations of student understanding of subject matter content.

Assessment of student projects can be simplified by providing students with a checklist of information that the assignment should address. For example, editing papers can be simplified by providing students with personal proofreading checklists to help them take charge of their own self-regulated editing. Teachers can develop these checklists with two to 10 items depending on the children's grade level. For example, a first grade checklist might contain only two items, one about using capital letters at the beginning of a sentence and a second item about using a period at the end of a sentence. According to Tompkins (2010), a middle-grade checklist might have items on capitalization, punctuation, paragraph indents, using commas in a series, apostrophes, correct use of pronouns, quotation marks, italics, correct word usage (especially homophones such as there and their; and to, too, and two).

A sample middle-grade proofreading checklist is presented in Figure 1 (Muschla, 2011; Richards & Lassonde, 2011; Tompkins, 2010). The self-regulated, single-focus editing process is recommended, because it is impossible for young writers and even for experienced writers to notice and remedy all the types of writing errors simultaneously (Crimi & Tompkins, 2005; Cunningham & Cunningham, 2010; Davis & Hill, 2003; Richards & Lassonde, 2011). Use the following personal proofreading checklist when proofreading your writing.

1. Sentences begin with a capital letter.
2. Sentences end with correct punctuation
3. Paragraphs are indented.
4. Proper nouns and proper adjectives are capitalized.
5. Commas are used correctly (between the items in a list, to connect compound sentences, and after introductory words, phrases, and clauses)
6. Apostrophes are used correctly (with possessive nouns and contractions)
7. Pronouns are used correctly.
8. Quotation marks are used correctly (for dialogue and for the titles of short stories, articles, poems, and songs).
9. Italics and underlining are used correctly (for titles of books, the names of newspapers and magazines, and the titles of movies).
10. Words are used correctly (especially homophones such as there, their, and they're; your and you're; its and it's; and to, too, and two).

Figure 1. Personal proofreading checklist.

Target dates help students plan their long-term assignments. In order to help students stay on schedule on elaborate, time-consuming writing projects, require students to submit outlines before they begin to develop detailed aspects of a writing project. For students who lack strong intrapersonal intelligence, it can be helpful to show them how to “backward map” their schedule from the due date. By assisting students to break up tasks into manageable pieces, you can prevent students from feeling overwhelmed. Elaborate writing projects typically involve five stages: prewriting, drafting, revising, editing, and publishing (see Lunenburg & Lunenburg, 2014, for a more thorough explanation of the five-stage writing process).

Tools for Integrating Multiple Intelligences in the Classroom

To integrate multiple intelligences into the classroom, it is important to teach subject matter through a variety of activities and projects. Therefore, your classroom should contain compelling activities that activate a range of intelligences. Furthermore, encourage students to work collaboratively as well as individually to promote both their interpersonal and intrapersonal intelligences. Assessments should be integrated into learning. According to Gardner, all students have all nine intelligences. Teachers can enhance students learning and strengthen their intelligences by nurturing the whole spectrum of intelligences. Three types of classroom teaching strategies are conducive to nurturing the whole spectrum of intelligences: “presentations, simulations, and learning centers” (Educational Broadcasting Corporation, 2004b, pp. 3-8).

Presentations

When teaching writing using the five-stage writing process (prewriting, drafting, revising, editing, and publishing), presentations typically occur during the final stage of the

writing process, called publishing. Publishing children's writing has several meanings. In general, publishing refers to sharing student's writing with a larger audience. The format can range from neatly handwritten stories that are read to classmates to computer-generated manuscripts that are sent to book companies for publication. Between the two ends of the continuum, teachers may find many ways to celebrate writing by helping students publish their work (Hughey & Slack, 2001; Lunenburg & Lunenburg, 2014).

One way of sharing students writing with an audience is through presentations. To deliver effective presentations, the student must understand the subject matter, the audience, different presentation strategies, and how to organize the information (Bratcher, 2012). As a writing teacher, you must consider what level of writing is developmentally appropriate for your students. A report might be a good way of presenting information; however, report writing is typically mastered in middle school. For high school students, a legal brief or journalistic reporting might be more appropriate. For presentations following a writing unit, students can write: journals, diaries, poems, essays, letters or emails, advertisements, new endings for a story, interviews, song lyrics, greeting cards, comic strips, directions or instructions to a prompt, travelogues, mini books, bound books, short plays, newspaper or newsletter, memoirs, legal briefs, and screenplays.

Simulations

Simulation activities develop students' multiple intelligences by providing them the opportunity to experiment with real-world activities. Such simulation activities have practical value. For example, before boarding an airplane, most people would want pilot to have had successfully completed many simulation activities on the ground, as well as practice in the air. NASA pilots engage in many simulation exercises before going into space. Athletes in all sports practice long hours (simulate) before participating in the actual sporting event.

In the early grades, the line between play and work is frequently blurred. One way for a child to master a new concept or behavior is to play with it. In the older grades, teachers often forget how effective play can be as an instructional tool. Instead of being told how to do something new, students will comprehend the new learning with greater understanding if that behavior is learned through experience. Simulation activities provide students with a safety net, like training wheels on a bicycle, like a blueprint before building a structure, or like using the five-stage writing process when teaching writing to students at all grade levels.

To supplement classroom work, consider using some of the following simulation activities: "role playing, debating, and simulation software" (Educational Broadcasting Corporation, 2004b, pp. 4-5). All have the potential to integrate multiple intelligences in the classroom.

Role playing. In a writing class, provide students the opportunity to research the life and works of professional authors, like Ernest Hemingway, F. Scott Fitzgerald, etc. Then students become that person and present a short lecture to other students in the class. The lecture can be followed by a question and answer session.

Debating. In a writing class, debates and panel discussions encourage students to think of topics more comprehensively. Visual aids (figures, tables, graphs, etc.) can support students' arguments. This technique is one way to initiate and develop topics for writing.

Simulation software. Students multiple intelligences can be activated through popular CD-ROM programs such as InsightMaker, which lets the user express his or her thoughts using rich pictures and causal loop diagrams. It lets the user turn these diagrams into powerful simulation models: System Dynamics and Agent Based Models. SimCity, another simulation software program, provides complex, open-ended problems-solving situations. The GenScope simulation software program provides an interactive environment where chromosomes, genes, and observable traits can be manipulated and viewed in a variety of ways. Virtus WalkThrough and other similar programs present environments for people to experience.

Learning Centers

Learning centers are areas in the classroom that a teacher establishes for students to work in groups or individually. Each of these learning centers, or "learning stations" are equipped with supplies and materials that provide students with the tools they need to complete a variety of activities and mini-projects. Learning centers help students understanding of subject matter and nurture multiple intelligences. The types of learning centers that are appropriate will be determined by classroom size, students' interests, and grade level. Learning centers are generally found more frequently in elementary and middle schools. Nevertheless, this technique has been found to be effective in high schools as well (Springer, 2010).

Writing teachers may want to consider establishing a Reading/Writing Center for activating students' linguistic, spatial, interpersonal, and intrapersonal intelligences. A Reading/Writing Learning Center is generally equipped with the following materials:

- Cushions for quiet reading or for group discussion
- Creative writing tools (pens, paper), tape recorder, magazines, starter books, and cards
- Yellow pages; other resource address books
- Lists of addresses and phone numbers of relevant organizations
- Computer: concept mapping software, word processor, email, Internet connection
- Multimedia presentation tools (e.g. PowerPoint, HyperStudio, etc.)
- Word games (Boggle, Scrabble, Password, etc.)
- Fiction and non-fiction books
- Illustrated books
- Books on tape with hard copy
- Books, articles, papers, poems written by students. (Educational Broadcasting Corporation, 2004b, p. 4)

Conclusion

The theory of multiple intelligences is a theory of intelligence that differentiates it into specific modalities, rather than seeing intelligence as dominated by a single general ability, often

called a “g factor.” Howard Gardner has identified nine distinct intelligences. The theory has emerged from cognitive research and documents the extent to which students possess different kinds of intelligence and therefore learn in different ways. According to Gardner, students possess all nine intelligences. Where students differ is in the strength of these intelligences. Gardner claims that these differences challenge an educational system that assumes everyone can learn the same subject matter in the same way and that a uniform measure can be used to test student learning. Our educational system is heavily biased toward linguistic modes of instruction and assessment and, to a somewhat lesser extent, toward logical-mathematical modalities as well. Not all learners possess equally strong linguistic intelligence. This intelligence may be more challenging for some learners and, therefore, writing may be more difficult for them. In this article, we incorporate Gardner’s multiple intelligences to help improve one discipline, writing instruction.

References

- Bartholomew, D. J. (2004). *Measuring intelligence: Facts and fallacies*. New York, NY: Cambridge University Press.
- Bratcher, S. (2012). *The learning-to-write process in elementary schools*. New York, NY: Routledge.
- Caine, G., & Caine, R. N. (2001). *The brain and the competitive edge*. Lanham, MD: Rowman & Littlefield.
- Crimi, F., & Tompkins, G. (2005). *Editing stations: Enhancing the readability of writing*. In G. Tompkins & C. Blanchfield (Eds.), *50 ways to develop strategic writers* (pp. 37-40). Upper Saddle River, NJ: Pearson/Merrill/Prentice Hall.
- Cunningham, P., & Cunningham, J. (2010). *What really matters in writing: Research-based practices across the elementary curriculum*. Boston, MA: Allyn & Bacon.
- Davis, J., & Hill, S. (2003). *The no-nonsense guide to teaching writing*. Portsmouth, NH: Heinemann.
- Diamond, M., & Hopson, J. (1999). *Magic trees of the mind: How to nurture your child’s intelligence, creativity, and healthy emotions from birth through adolescence*. New York, NY: Penguin Group.
- Educational Broadcasting Corporation. (2004a). *Tapping into multiple intelligences: Exploration*. New York, NY: Author.
- Educational Broadcasting Corporation. (2004b). *Tapping into multiple intelligences: Implementation*. New York, NY: Author.
- Eisner, E. W. (1992). Curriculum ideologies. In P. W. Jackson (Ed.), *Handbook of research on curriculum: A project of the American Educational Research Association* (pp. 302-326). New York, NY: Macmillan.
- Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. New York, NY: Basic Books.
- Gardner, H. (1993). *Multiple intelligences: The theory in practice*. New York, NY: Basic Books.
- Gardner, H. (1999a). *Intelligence reframed: Multiple intelligences for the 21st century*. New York, NY: Basic Books.

- Gardner, H. (1999b). Are there additional intelligences? In J. Kane (Ed.), *Education, information, transformation: Essays on learning and thinking* (pp. 111-131). Upper Saddle River, NJ: Prentice Hall.
- Gardner, H. (1999c). *The disciplined mind: What all students should understand*. New York, NY: Simon & Schuster.
- Gardner, H. (2004). *Changing minds: The art and science of changing our own and other people's minds*. Cambridge, MA: Harvard Business School Press.
- Gardner, H. (2008). *Multiple intelligences: New horizons in theory and practice*. New York, NY: Basic Books.
- Gardner, H. (2011). *The unschooled mind: How children think and how schools should teach*. New York, NY: Basic Books.
- Giles, E., Pitre, S., & Womack, S. (2003). Multiple intelligences and learning styles. In M. Orey (Ed.), *Emerging perspectives on learning, teaching, and technology*. Retrieved from <http://projects.coe.uga.edu?epltt/>
- Hampton, S., Murphy, S., & Lowry, M. (2009). *Using rubrics to improve student writing*. Newark, DE: International Reading Association.
- Hanson, A. (2009). *Brain-friendly strategies for developing student writing skills* (2nd ed.). Thousand Oaks, CA: Corwin Press.
- Jensen, E. (2005). *Teaching with the brain in mind*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Lunenburg, F. C., & Lunenburg, M. R. (2014). Teaching writing in elementary schools: Using the learning-to-write process. *International Journal of Education*, 2(1), 1-27.
- Muschla, G. R. (2011). *Practice makes perfect: Exploring writing*. New York, NY: McGraw-Hill.
- Richards, J. C., & Lasonde, C. A. (2011). *Writing strategies for all primary students: Scaffolding independent writing with differentiated mini-lessons, grades K-3*. San Francisco, CA: Jossey-Bass.
- Springer, S. (2010). Learning centers in the classroom. In S. Springer, B. Alexander, & K. Persiani-Becker (Eds.), *The organized teachers guide to your first year of teaching* (pp. 3-14). New York, NY: McGraw-Hill.
- Sylwester, R. (2004). *How to explain the brain: An educator's handbook of brain terms and cognitive processes*. Thousand Oaks, CA: Corwin Press.
- Tompkins, G. E. (2010). *Teaching writing: Balancing process and product*. Boston, MA: Allyn & Bacon.
- Tupper, K. W. (2002). Entheogens and existential intelligence: The use of plant teachers as cognitive tools. *Canadian Journal of Education*, 27(4), 499-516. doi: 10.2307/1602247
- Zadina, J. (2014). *Multiple pathways to the student brain: Energizing and enhancing instruction*. New York, NY: Wiley.