Integrated Instruction:
Multiple Intelligences and Technology

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Abstract: Advancements in technology have changed the day to day operation of society. The ways in which we teach and learn have begun the same process. For this reason, we must reexamine instruction. In this article, the author analyzes the changing environment of educational technology and how to incorporate the theory of multiple intelligences. The teaching strategies presented outline how to enhance student performance by blending new technologies with time-tested pedagogy. The author explains and matches up each intelligence with an effective technology tool. He also provides examples from scholarly publications and actual classroom practice.

Keywords: instructional technology, multiple intelligences, technology integration

Technology has changed the appearance and operation of modern society. Our world has become digital, and our classrooms are steadily following suit. The teacher remains the focal point, but new resources are adapting how instruction occurs. For example, a liquid crystal display (LCD) projector was once an unheard-of expense for schools. The power of the projector has now evolved from simple presentation device to the heartbeat of interactive whiteboards, which bring content to life for all learners. Technology integration is not only changing the way we think but also the way we teach.

In 1983, Howard Gardner (2003) equally revolutionized the way we view intelligence with the introduction of multiple intelligences (MI). He originally listed seven intelligences: linguistic, logical–mathematical, spatial, musical, bodily–kinesthetic, interpersonal, and intrapersonal. Since then, he has expanded the list to eight and a half, adding naturalistic and a possible existentialist. Over the past twenty plus years, not only have education professionals embraced his theory, but experts in psychology, anthropology, and other disciplines also have.

Gardner (2003) theorized that we all possess each intelligence to some extent. A gifted musician will have an obviously strong musical intelligence but may also possess the logical intelligence necessary to improvise. Simply considering which intelligence is strongest suggests the presence of a basic intrapersonal skill. MI theory questioned the idea of general intelligence, which was customarily based on linguistic and logical ability. Gardner maintained the gold standard of general intelligence to be a law professor. This definition of intelligence left out athletes, musicians, and environmentalists, to name a few.

MI and technology blend in the modern, changing environment of education. To compete in the world marketplace, today’s students must acquire twenty-first century skills, such as global awareness and social responsibility, while in high school. Technology allows these skills to be presented. The teacher’s instruction must then focus on student achievement so that the technology integration is effective. One of the best ways to meet these needs is to differentiate instruction through the use of Gardner’s MI. Each intelligence is broadly defined and allows flexibility when making adjustments to existing curriculum.

The first step to incorporate MI theory into a technology-based curriculum is to assess students’ strong and weak intelligences. MI tests can be acquired from numerous online and paper sources. Most tests are approximately seventy-five questions long and can be completed quickly. The examinee is given statements and asked how much he or she agrees with each.
Sample statements express sentiments such as “I enjoy keeping a pet” or “I am very proud of my personal library.” Once the test is completed, an evaluation explains which intelligences are strong and weak for that individual.

Next, the teacher must assess and teach to his or her students’ strengths. Each intelligence supports certain instructional strategies. Some are more complex than others. Differentiating instruction along these parameters takes creativity and commitment. The ultimate goal is to meet the overall needs of each learner in the class and therefore might require designing multiple lessons. Student choice is another important aspect of this process. The teacher must allow students to do the projects that most interest them. In most cases, students will choose the one that best fits their MI profile.

**Linguistic Learners**

Linguistic learners are characterized as students with excellent written and oral skills. They excel in the humanities and focus on careers in journalism and politics. Instructional strategies that work for linguistic learners must focus on self-expression. Using the Internet for research and then presenting their findings is an excellent project for these students. They are very comfortable speaking and benefit greatly from giving presentations or doing desktop publishing (Carlson-Pickering 1999; Lamb 2004h).

Students with a strong linguistic intelligence enjoy a project such as a class poem. The teacher sets up a few computers to act as learning stations. Each computer has an open word processing document with lines that are incomplete (e.g., “I am,” “I see,” “I think”). Students then move to each station and complete the phrase with a statement of their choosing. Linguistic learners embrace this learning opportunity because they can use their verbal skills to express an abstract concept (Haywood n.d.).

**Logical–Mathematical**

Logical learners work best with tangible projects and results. Their career interests are focused on mathematics and engineering. The technologies that benefit them most are databases and spreadsheets. Both of these programs allow students to calculate and organize data. Logical learners also excel at inquiry-based projects. These students enjoy being presented with a problem and then given resources to solve it. A definitive answer is what these learners seek (Lamb 2004e; Rosen 1997).

The use of manipulatives is a great activity for students with strong logical intelligences. The examples become even more effective if the teacher has access to an interactive whiteboard. Logical students’ understanding of mathematics is strengthened by visualization of concepts and the ability to move geometric objects. For example, using a java application, the teacher can project a geoboard (interactive pegboard that measures angles) on his or her interactive whiteboard. Students can then attach bands to the pegs of the geoboard by touching the screen. This creates angles that can be measured and incorporated into the geometry lesson.

**Spatial**

Spatial learners are extremely visual. These students look to artists and architects for inspiration. Creativity is the key for these learners. They enjoy digital and video-camera projects. Computer-aided design and paint programs can also maximize their potential. Like the logical learner, spatial learners are result driven. Their final projects usually differ from those of the logical learners in that spatial learners focus on interpretation and beauty (Lamb 2004i).

An engaging lesson for spatial learners incorporates visual aspects into the set curriculum. Students can research famous quotes and images and then give a short introspective speech. Internet research gives students the ability to find an almost unlimited number of quotes and pictures. Once their research is complete, they can share their work with the use of presentation software. This activity allows the spatial student to express his or her creativity while still covering necessary content.

**Musical**

Musical learners focus on listening and creating rhythms and patterns. They express themselves through auditory means. Some career paths for musical learners are obvious, such as composer or disc jockey. Others, however, such as sign-language interpreter, are less intuitive. A person who possesses strong musical and linguistic skills might consider this career because there is heavy emphasis on patterns and timing.

Musical learners benefit most from interactive books, video and audio recordings, and audio notations. These learners adapt well to cross-curricular projects that can incorporate music (Lamb 2004f).

A good technology to use with musical learners is a software program that synthesizes music into waves. These students benefit greatly by using their musical talents to break down and rebuild melodies. This encourages critical thinking skills that can be used in all disciplines. It also stimulates the learner’s visual (seeing music as waves), auditory (hearing and building melodies), and kinesthetic (manipulating waves) learning styles. Synthesizer software is affordable; an online review lists quality software around $149 (Penton Media 2007).

**Bodily–Kinesthetic**

Kinesthetic learners are acutely aware of the roles their bodies play in their learning. Their ideas are best
expressed through movement. Career prospects for these learners include athlete, police officer, and actor. These students need to manipulate their surroundings to achieve their maximum potential. They benefit greatly from video production, virtual field trips, and PDAs for data collection (Lamb 2004a).

Susan Griss (1994) is a leader in kinesthetic teaching. Her book, *Minds in Motion* (1998), outlines numerous lessons to use for students with strong kinesthetic intelligences. A great example is a unit on the Underground Railroad. The teacher turns out the light and plays spirituals while students duck behind trees and avoid barking dogs. Presentation software and speakers can be used to simulate this environment. Suddenly, the teacher’s leg is caught in a trap and the students must decide what to do. This lesson brings learning to life. Students are not only learning about the trials of runaway slaves but also about how to think on their feet to save their leader.

**Interpersonal**

Interpersonal learners interact well with society and have been labeled in classroom-management circles as the “talkers.” They are exceptionally aware of the feelings and motives of others around them and are also especially good at starting discussions and encouraging participation from other classmates. Interpersonal learners thrive as counselors and salespeople. They enjoy creating products that allow them to express themselves to an audience. Presentations, e-mail projects, and videoconferencing inspire these students (Haywood n.d.; Lamb 2004c).

Interpersonal students and math usually do not mix. These learners are more focused on people and their opinions. A teacher can use this to his or her advantage with a simple statistics lesson. A group of interpersonal learners can use numerous online survey tools to create a test for other students. This focuses on their communication and creative strengths because the topic can be whatever they like. The content of the survey is moot; synthesizing the results is what matters. Once the other students have taken the survey, the group can create a visual representation of the results.

**Intrapersonal**

Intrapersonal learners are keenly self-aware. They are characterized as self-motivated and learn through metacognitive processes. Job targets for these students are in research, literature, and entrepreneurship. Computer-based journaling, concept mapping, and Internet research are all good technology options for these learners. The final products from these students can vary. If the student also has a strong spatial intelligence, graphic organizers and concept maps are very effective. If the student has a stronger linguistic intelligence, then a research paper may be more fitting (Lamb 2004d).

Oftentimes, intrapersonal learners create great products but are not sure how to share them beyond the school community. For that reason, blogs are a great resource for intrapersonal learners. They allow these students to express their thoughts and feelings in an ordered way. Students still create a self-reflective piece in a generally self-paced environment; however, it can then be effectively shared with others. A blog provides an outlet and might open the door for further opportunities, such as writing contests.

**Naturalistic**

Naturalists learn best by making connections between how content interacts with the natural world. These students find careers in the fields of agriculture, botany, and biology. Cameras are an excellent technology resource for these students. They take pride in recording and presenting the natural world (Lamb 2004g).

Showing change over time is another gainful project for these students. Synthesizing the change of seasons or showing the transition of animals are two great examples of projects that could incorporate numerous visual technologies. Once the students have gathered data, they can catalog it for future use. Electronic databases and spreadsheets allow naturalists to not only present what they have found but also create a tangible product for those who come after them (Gen 2000).

**Existentialist**

The existentialist is a new intelligence. These learners focus on the big picture and why the world operates the way it does. These learners find careers as philosophers and cultural anthropologists. The best technologies to use with these learners are communication and problem-solving applications. Other strong intelligences for existentialists are usually naturalistic, spatial, or logical (Lamb 2004b).

The nature of technology is existential. Use of technology continues to evolve how we look at ourselves. Students with a strong existential intelligence enjoy a Web 2.0 project. These students can research how Internet collaboration is changing the world around them. Text was once written by hand or on a typewriter. It is now digital and ever changing. Look no further than instant-messaging language and programmer’s code. Some of the products existentialists will produce can be startling. The idea that we all belong to an electronic world in which computers might one day have the capacity of the human mind sounds like science fiction; however, it is a sample topic that would help a student with a strong existentialist intelligence flourish (Fisch 2007).

Thoughtful and purposeful use of technology has a great impact on student achievement. It allows other avenues to be explored and helps in the process of differentiating instruction.
that incorporates technology and time-tested theories such as MI supplements students' strengths and expands their possibilities. Technology only provides the backdrop for the twenty-first century. Effective instruction is what directly affects students' acquisition of the twenty-first century skills necessary to compete in universities and an increasingly competitive job market.

NOTE

1. Two good sources for online MI tests are the following sites: http://www.mitest.com/o7inte~1.htm and http://www2.bgfl.org/bgfl2/custom/resources_fip/client_fip/ks3/ict/multiple_int/questions/choose_lang.cfm

2. The following site, provided by the National Library of Visual Manipulatives, is an excellent source for manipulatives: http://nlvm.usu.edu/en/nav/vlibrary.html.


REFERENCES


