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Media Selection: Mapping Technologies to Intelligences

by *Walter McKenzie*

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In the unfolding Information Age media dictates the delivery of all the data we encounter. From the time we rise in the morning until we retire each night, the ways we consume information help to shape our knowledge base and our decisions.

Yet people are not always conscious of each medium they encounter; mode of delivery seems to get lost in the mix as we are inundated by volumes of information in endless cycles. While it is easy to become desensitized as consumers of information, as educators we are in a unique position to maximize media selection and get a handle on this explosion of information for our students. As McLuhan suggested prophetically, the medium may not only be the messenger, it may be the message.

When I am discussing the current state of technology with teachers around the country, it becomes clear that they feel bound by their access to technology, regardless of their situation. If a teacher has a television-computer setup, then that is what he or she will use in the classroom. On the other hand, if there is an LCD projector hooked up to a teacher demonstration station in a fully equipped lab, he or she will be more apt to use that set up. Teachers have always made the best of whatever they've got at hand. You can still easily find Apple IIe labs with filing cabinets full of 5" disks in use in school systems. Of course it's dated technology, but it's what we have to work with. Teachers make due.

Gardner's multiple intelligences theory challenges us to look beyond our available technologies and stay focused on the fact that we are teaching children rather than teaching information. As we become ever more aware of the paths to learning, we are even more in need of vehicles to accommodate all these different modalities in the classroom. Half a century ago this would have been an even more daunting task. But in the Information Age, we have technologies evolving, even as we speak, that hold new promise to reach all learners.

This is an incredible opportunity for educators, as the impact of brain research and technology together support our conviction that all children can be successful. The question we must ask ourselves is not about access but appropriate use of technology. Certainly we have more choices today, but how do we discern media that are most appropriate for a given learning task? When it comes to technology,

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Media Selection, continued

media selection is a critical piece in the instructional design process. Unfortunately in this age of media saturation, media selection is often overlooked when imple1menting a lesson in the classroom.

What is the first step in proper media selection? Like all good instruction, the learner must always come first. What knowledge base do they bring to this lesson? Is it introductory, guided practice or remediation? What technology skills are they proficient in and what do they need to learn? Also, what intelligence strengths do they possess and which intelligences need to be further developed? All of these questions help to tailor the lesson to meet students at a level at which they are ready to learn.

With the student piece in place, the learning objective is the next consideration in media selection. Is the objective appropriate? What do you expect learners to be able to do by the end of this lesson? How can you structure the lesson to make this possible? How will you be able to measure student success in accomplishing this? In answering these questions, you come a step closer to identifying appropriate technologies for your lesson.

Before looking to the technologies to which you have access, though, it is important to next look at the intelligences you wish to target in supporting your students to meet the stated objective. Considering the learner and the lesson objective, which intelligence or intelligences should you target to make the lesson a success? And once you have answered this question, which technologies best accommodate these intelligences? These questions will help you lock in the technology or technologies that are appropriate for your lesson.

The process flows accordingly:

Learner ➢ Objective ➢ Intelligences ➢ Technology

By considering instructional design factors in this order, you can successfully select appropriate media for any lesson in your classroom. Considering the learner and objective will be second nature to most teachers. But how do we consider the intelligences with regard to technology?

It is tempting to select the technology you want to use and then make it "fit" the intelligences. However, does that process truly help you identify appropriate strategies, or is it simply going through the motions of justifying your personal preferences? Rather, start with your knowledge of intelligences and consider which media will naturally support them. The table on page 7 summarizes examples.

Media Selection, continued

Intelligence	Technologies
Verbal/Linguistic	Textbook, pencil, worksheet, newspaper, magazine, word processing, electronic mail, desktop publishing, web-based publishing, keyboard, speech recognition devices, text bridges
Logical/Mathematical	Lecture, cuisenaire rods, unifix cubes, tangrams, measuring cups, measuring scales, ruler/yardstick, slide rule, graphing calculators, spreadsheet, search engine, directory, FTP clients, gophers, webquests, problem solving tasks, programming languages
Visual/Spatial	Overhead projector, television, video, picture books, art supplies, chalkboard, dry erase board, slide shows, charting and graphing, monitor, digital camera/ camcorder, scanner graphics editor, html editor, digital animation/movies
Bodily/Kinesthetic	Construction tools, kitchen utensils screw, lever, wheel and axle, inclined plane, pulley, wedge, physical education equipment, manipulative materials, mouse, joystick, simulations that require eye-hand coordination, assistive technologies
Musical/Rhythmic	Pattern blocks, puzzles, musical instruments, phonograph, headphones, tape player/recorder, digital sounds, online pattern games, multimedia presentations, speakers, CD ROM disks, CD ROM player

Continued, page 8

Media Selection, continued

Intelligence	Technologies
Intrapersonal	Journals, diaries, surveys, voting machines, learning centers, children's literature, class debate, real time projects, online surveys, online forms, digital portfolios with self-assessments
Interpersonal	Class discussion, post-it notes, greeting cards, laboratory, telephone, walkie-talkie, intercom, board games, costumes, collaborative projects, chat, message boards, instant messenger
Naturalist	Magnifying glass, microscope, telescope, bug box, scrap book, sandwich bag, plastic container, database, laserdisc, floppy drive, file manager, semantic mapping tools
Existentialist	Art replica, planetarium, stage drama, classic literature, classic philosophy, symbols of world religions, virtual communities, virtual art exhibits, virtual field trips, MUDs, virtual reality, simulations

Let's take a closer look at each intelligence and the media that will offer appropriate support. Always well accommodated in the classroom, the verbal/linguistic intelligence can be even more effectively used through modern technologies. Set aside the traditional textbook, pencil, and paper and consider the ways word processing promotes not only composition but also editing and revising in ways that streamline the Writer's Workshop approach. Desktop publishing and web-based publishing take this idea to new levels of efficacy as students can see their work celebrated within the classroom and beyond in the "virtual" world. Electronic mail is a wonderful way to promote verbal/linguistic learning, as students are prompted to inquire of and respond to correspondents through written text.

The logical/mathematical intelligence is promoted through activities that stimulate reasoning. It can include a traditional lecture, analyzing data through a spreadsheet, conducting queries using a search engine or directory, participating in the problem solving process of a WebQuest, and even mastering a programming language or a networked system of computers.

Media Selection, continued

The visual/spatial intelligence especially benefits from technology in modern education because there are so many new ways to stimulate this path to learning. While the overhead projector, slide projector and TV/VCR have been around for thirty years or more, the use of digital slide shows is a newer way to create, manipulate and present learning in the classroom. Charting and graphing has been made so much easier from the days gone by through all kinds of applications (word processors, draw/paint programs, spreadsheets, databases), and graphic editors allow us to manipulate any image to meet our needs. Throw in the possibilities for website design and construction and the recent advances in digital animation and movies and you can easily see why the visual/spatial intelligence is so aptly supported by technology.

The bodily/kinesthetic intelligence is stimulated by physical interaction with one's environment. When used in instruction, students who manipulate materials can develop a greater understanding of skills and concepts. Diagramming on the board, sorting manipulative materials by attributes, participating in a group simulation, or using an adaptive switch in order to input responses into a computer are all examples of how the bodily/kinesthetic intelligence can be accommodated.

The musical/rhythmical intelligence is the intelligence of patterns. It is accommodated in a variety of ways via technology. For example, using the tape recorder in a listening center with books to follow along prompts the use of this intelligence. Incorporating digital sounds into a multimedia presentation also accommodates this path to learning. Playing online pattern games like Mastermind and Concentration can be very musical/rhythmical. Even looking for visual patterns in the classroom or the schoolyard fosters musical/rhythmical thinking.

The intrapersonal intelligence is stimulated through activities that bring feelings, values and attitudes into play. For example, conducting a class debate on an environmental issue, following a real time expedition through uncharted islands, completing online surveys on an issue being studied in the classroom, completing an online form as a facilitating event for a unit of study, or evaluating one's own digital portfolio full of work from a semester or marking period are all ways to nurture the intrapersonal intelligence.

The interpersonal intelligence can be accommodated through class discussion on relevant topics, collaborative projects that enrich and extend the curriculum, synchronous chat between groups of students or with experts, participation in newsgroups on an assigned topic, and even mailing lists that allow multiple classes to all share ideas and experiences asynchronously.

Organizing and making sense of information in categories and hierarchies stimulates the naturalist intelligence. Creating a database to sort and search through data is a wonderful naturalist exercise. Using a laserdisc on weather is an effective way to share scientific phenomena in the classroom. More than any other activity though, semantic mapping is decidedly the most naturalist. Consider the use of the software application "Inspiration" in visually mapping out understandings of facts and concepts and how it allows the learner to manipulate ideas.

The existential intelligence is stimulated through learning experiences that reinforce one's sense of the "big picture" of learning. Newspapers, magazines and

Media Selection, continued

virtual communities all help students feel like they belong to something larger than their family or classroom. Virtual art experiences and field trips help students to vicariously experience beauty and awe as it exists in the world far beyond the classroom. Even online interaction with significant people through interviews and archives can promote the use of the existential intelligence.

The one caveat that has to be made here is that applications are not so neatly categorized by intelligences. Even though an HTML editing program like DreamWeaver seems to be a visual tool at first glance, consider the intra- and interpersonal dynamics that come into play as a website is formed. Or then again, the listening center described above might actually be construed as a verbal/linguistic activity rather than a musical/rhythmic task. In fact, it is both. My point is this: the only way to determine the intelligences a technology stimulates is to look at the task the technology is being used to accomplish. The technology itself is not a goal for instruction; it is merely a tool to help you accomplish that goal. It is in the process of instruction identified by a learning objective that we see the true nature of any technology and its relationship to the intelligences.

Dr. Sheryl Asen has identified ten criteria to guide incorporating technology into instruction. By using these criteria to plan for and evaluate the use of ~~a~~ technology, we can determine how well the technology supports educationally sound instruction.

1. Students are involved in tasks that are broad in scope and challenging. Activities should span a range of related, intellectually demanding experiences that are not divided into fragmented tasks. (existentialist)

2. Students, rather than the teacher, have control over the learning.
   The teacher serves as more of a guide, coach, and resource rather than a supervisor or administrator. (intrapersonal)

3. Students work collaboratively and cooperatively.
   Learning tasks should not be accomplished in social isolation. (interpersonal, kinesthetic)

4. Students practice and apply communication skills during learning.
   Learning tasks should promote questioning, discussion, and interaction. (verbal/linguistic)

5. Students participate in varied learning tasks.
   This includes both variations in the format of the activities and in their objectives. (musical/rhythmic, kinesthetic)

6. Students have opportunities to address learning tasks in different ways.
   Different approaches to a presented activity can be explored. (naturalist)

7. Students learn and apply higher order thinking skills through problem solving tasks and reflection.
   Activities do more than ask students to recall rote facts, terms and definitions. (logical/mathematical)

Media Selection, continued

8. Students are encouraged to offer varied solutions to a given problem. Reasoned answers and appropriate products are not limited to pre-set responses. All justifiable and fitting answers and products are accepted. (visual/spatial)

9. Students are encouraged to contribute personal ideas and experience to the learning task. Student input into the learning process is valid and valued. (intrapersonal)

10. Students are intrinsically motivated by the prescribed learning tasks. Accomplishing the task is rewarding on its own merits regardless of the technologies being used. (existentialist)

Note how well Asen's criteria match with Gardner's intelligences. From the objective to the assessment and every step in between, multiple intelligences can help teachers to expand their repertoire of instructional strategies and balance their selection of resources and materials, including technology.

By taking the intelligences into consideration, teachers can more effectively make use of the technologies they have at their disposal for instruction. The key is to place consideration of the intelligences into the media selection process after the learner and objective but before actually considering your technology options. In this way, teachers can avoid allowing technology to dictate their instructional choices and put it in its proper place in instruction: as a delivery vehicle for content, concepts and skills.

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