Connecting Depth and Balance In Class

Tremendous growth in educational technology tools, applications, and Web 2.0 resources have created a plethora of new methods to meet the learning needs of all students. Unfortunately, the potential of these methods is hardly understood before a new technological breakthrough makes its way into the classroom, through either teachers or, more commonly, through students. On the other hand, this technological progress has breathed new life into curricular taxonomies and learning style continuums. When used correctly, educational technology gives new meaning and utility to long-established educational paradigms, such as Benjamin Bloom’s Taxonomy (revised) and Howard Gardner’s Theory of Multiple Intelligences.

Learning Taxonomies
A number of prominent taxonomies have been used to plan, classify, and evaluate curricula. The best ones are backed by rigorous research and include detailed classification systems to determine curricular balance and depth. Educators are most familiar with the simplified depiction of the cognitive levels of Bloom’s Taxonomy. For a more in-depth discussion of the revised Bloom’s Taxonomy, one should see the skillfully crafted article “A New Bloom: Transforming Learning” by Cochran, Conklin, and Modin in the February 2007 issue of LE&L. While Bloom’s and other well-designed taxonomies are tremendously useful for educational researchers and curriculum specialists, they’ve had less utility for the average classroom teacher. In the day-to-day rigors of schooling, do teachers regularly use these sorts of taxonomies to plan their lessons? Not usually. Fortunately, the power of educational technology is making it easier for teachers to ensure depth and balance in their lessons, even if they do not deliberately employ one of the popular taxonomies.

Multiple Intelligences
Similar to Bloom’s Taxonomy, learning style theories can be difficult to effectively apply in the classroom. Fortunately, the differentiating power of educational technology makes meeting the needs of different “intelligences” or “learning styles” more and more possible. Gardner’s Theory of Multiple Intelligences and other learning style inventories (See Resources on page 21) seem to have been more useful in the theoretical realm of education than under the constraints of the practical classroom setting. However, we again see the beginnings of a paradigm shift as the differentiating power of educational technology makes meeting the needs of different intelligences or learning styles more practical in the day-to-day world of a classroom teacher. Combined with learning taxonomies, this creates exciting opportunities to improve pedagogy.

Lesson Plan Analysis
An interesting example of how schools are deliberately leveraging technology to add learning style variety and depth to the curriculum can be seen in Williamsburg, Virginia, where each school has Instructional Technology Resource Teachers (ITRT). We at Mid-continent Research for Education and Learning (McREL), a nonprofit education research organization in Denver, Colorado, worked with a talented group of ITRTs for a year to explore connections between instructional best practices and educational technology. In a recent workshop on technology and learning styles, ITRTs investigated various technologies used to meet individual learning needs. The culminating activity of the two-day workshop focused on evaluating the integration of technology in lesson plans drawn from participants’ schools. ITRTs wanted to see if the technology they helped blend into lessons improved the depth of knowledge and variety of learning styles. As part of this evaluation, the ITRTs began with a Bloom/Gardner learning matrix created with Inspiration software and then created their own based on a classroom teacher’s plans they were
Create

Analyze

Evaluate

Depth and Multiple Intelligences Essential Parts of Their Lesson Plans

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Innovative Technology and Multiple Intelligences

Conscientious teachers can use a matrix to incorporate learning taxonomies and multiple intelligences into lesson planning. With the huge demands on their time, one might think that incorporating this wisdom into the day-to-day lesson planning process is near the bottom of the priority list for busy teachers. But with technology, teachers can more easily differentiate instruction to meet the needs of each student’s learning style with suitable and systematic depth. Consider some brief examples of how this is occurring in today’s contemporary classrooms.

Naturalistic, logical, and kinesthetic learners’ needs are served in science classes at JFK Middle School in Bethpage, New York, when they use laboratory probeware and wireless laptops to conduct experiments in and out of the lab on the acidity of local rainfall. This allows the students to analyze the data and propose solutions for any problems they may find. Another activity for naturalistic and logical elementary learners is carried out at American Academy in Lone Tree, Colorado, using the Bug Catcher Game from the Museum of Victoria in Australia to learn about and classify insects from around the world.

Verbal/linguistic and interpersonal learning preferences are attended to in English IV classes at Columbia Central High School in Columbia, Tennessee, by using blogs to facilitate in-depth group discussions, peer feedback, class notes, and highlights of exemplary student work.

Further examples can be found at Norcross High School in Norcross, Georgia, when mathematics and science students use logical and visual/spatial intelligences to deepen their understanding and evaluate different permutations of mathematical and...
One cannot help but meet a variety of learning styles, with experiential depth, if technology is purposefully and wisely integrated into the regular day-to-day curriculum.

scientific concepts. They do so with the aid of an integrated whiteboard system and interactive applications from Explore Learning.

High school students 875 miles away are using logical intelligences along with intrapersonal skill at La Follette High School in Madison, Wisconsin, as they use Inspiration software to organize their thoughts and create original poetry.

In addition, elementary students at Selinsgrove Intermediate School in Selinsgrove, Pennsylvania, use musical and visual intelligence in the music lab at San Francisco Symphony Kids to learn about tempo, rhythm, pitch, and harmony, and apply them to instrumentation and composition as they create their own music.

Middle school social studies students at Mont’Kiara International School in Kuala Lumpur, Malaysia, use a wiki to discuss the significance of historical and current events and collaboratively design pieces of original student work.

Even more intriguing is the new generation of learning software becoming more prevalent in today’s schools. Many programs in the past were of the drill-and-practice variety, but now programs are drawing upon the large body of emerging neuroscience research about how the brain learns. This is spawning programs that can custom-
<table>
<thead>
<tr>
<th>Verbal/ Linguistic</th>
<th>Intrapersonal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a word wall</td>
<td>Interactive technology activity: <a href="http://kids.mlpe.hq.nasa.gov/droplet.html">http://kids.mlpe.hq.nasa.gov/droplet.html</a></td>
</tr>
<tr>
<td></td>
<td>Prewriting activity “The Journey of One Droplet of Water”</td>
</tr>
<tr>
<td></td>
<td>Reviewing and editing the final student-made water-cycle movies</td>
</tr>
<tr>
<td>Write script and dialogue for class multimedia project</td>
<td>Creating effects, edit class video project</td>
</tr>
</tbody>
</table>

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Gardner, and others. Even the least-experienced teachers can provide more depth and learning-style differentiation if they effectively use educational technology to teach.

**Resources**


Columbia Central High School blog: http://www.elizabethfullerton.com

Explore Learning: http://www.explorelearning.com

FastForWord software http://www.scilearn.com


Inspiration: http://www.inspiration.com

Learning styles inventories: http://del.icio.us/mattscottkuhn/Learning-Styles/

Mont’Kiara International School wiki: http://ssmeetsit.edublogs.org

San Francisco Symphony Kids: http://www.sfkids.org

Scientific Learning Corporation: http://www.scilearn.com

Technology and Learning Styles workshop: http://www.mcrel.org/technology/

Theory of Multiple Intelligences: http://del.icio.us/mattscottkuhn/learning-styles/

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