Enhancing Multi-Disciplinary Teaching and Learning

With Graphics and PowerPoint Presentations

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<u>Abstract</u>

I propose to explain and demonstrate, through this paper and the accompanying PowerPoint presentation, how to enhance students' comprehension and retention of multi-disciplinary lessons. My sample lesson will demonstrate the far-reaching influence of the Cartesian Dichotomy on Western philosophy as it has, since the Enlightenment Age, influenced, and continues to influence, attitudes towards nature and human civilization.

In a frightening domino effect, such attitudes went on to, and continue to, affect how Europeans and other Western thinkers, including Americans, relate to less technologically developed cultures, as well as to the planet we all share. While I consider this lesson to be of vital importance for my students to absorb, of equal significance for this conference presentation is the use of graphics and PowerPoint animations to enhance learning and retention of these complex, inter-related ideas.

As indicated by my title, my presentation will include elements of philosophy, history and art. To help my students see meaningful connections among these complicated areas, I also include graphics, such as concept maps, and PowerPoint animations that reveal and hide answers to provocative questions. In this way, once I have presented such a PowerPoint in class, I add it to my course Blackboard site for students to use as self-testing dev ices. For example, I construct the presentations so that clicking "N" (for next) reveals, then hides, information to aid class discussion. Thereafter, students are also able to review the material on their own, "disappear" the answers, practice recalling them, then click "N" again to confirm their correct answers or pinpoint weakness in their understanding for review.

While I have not done quantitative research on this methodology, since statistics is not my field, I can clearly see that students appreciate the presentations in class. More importantly, I can see that students who use such review materials to study for quizzes, exams and essays learn the material in a more meaningful way and are more successful in their work, overall. I have found this method far more successful than my previous practice of providing practice quizzes through Blackboard, which are only practicable as true-false or multiple choice questions, which might promote rote memorization, but neither indicate nor enhance meaningful understanding of the subject matter. I will also share research,

such as that by the learning and memory scholar John Medina, that such reworking of course material is far more effective at promoting meaningful learning than the blithe expectation that our students must simply fall back on the tried-and-not-so-true method of rote memorization. What's more, surveys in many fields affirm that colleges have been turning out a rather disappointing "product" from the perspective of future employees through the lack of such meaningful learning needed to help students and future employees to think more creatively in solving novel problems.

Argument and Demonstration:

While I have long been an advocate and practitioner of concept mapping in teaching all my courses, and assume many of you are and have been as well, it makes sense to present some outside support for its efficacy, as well, especially for my students who might, at first, find them unnecessarily complicated. Along those lines, I offer these pearls of wisdom from no less an expert on learning and memory than John Medina, Director of Talaris Research Institute and author of the book *Brain Works*:

- ▣ Human brains do not receive and process information like "video tape recorders." They deconstruct input, then reconstruct meaning.

- ▣ Every brain is wired differently from every other brain, individually processing information in ways unique to that wiring.

- ▣ People are natural explorers, using hypothesis testing to process information. This tendency can be observed in early infancy and is probably genetic.

- ▣ Practice increases learning. Repetition and rehearsal are critical for the successful creation of long-term memories.

- ▣ Half the human brain cortex is devoted to processing visual information. We process visual information more effectively than any other type.

- ▣ People do not learn optimally from continuous long stretches of linearly supplied information. Deliberate breaks are critical for apprehension.

I trust that you already see the connections between his and Joseph Novak's statement from *Learning How to Learn*, "Whereas most humans have a notoriously poor memory for recall of specific

details, their capacity for recall of specific visual images is remarkable. . . . Concept mapping has a

potential for enlisting this human capacity for recognizing patterns in images to facilitate learning and

recall" (28). Thereafter, I introduce basic concept mapping to my students with, what else, a concept map.

To make the connections even clearer, I present the following slide which extracts key words from

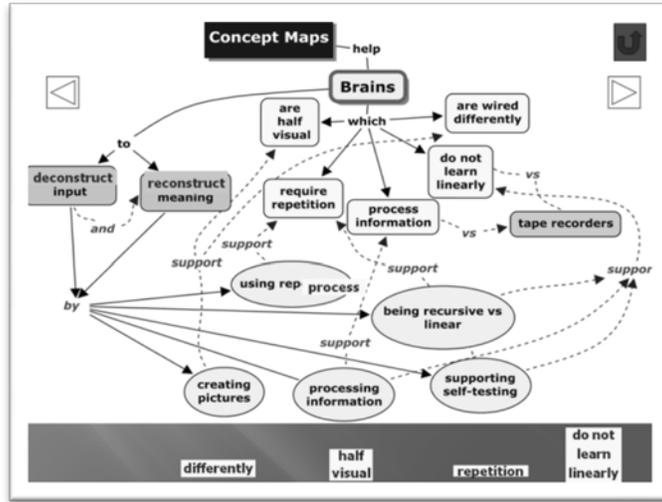Medina's statement to "migrate" into an animated concept map:

Fig. 1: In this screen capture of an animated map, concepts selected from John Medina's "brain rules" are frozen mid-migration into corresponding concept boxes, highlighting the confluence of learning research and Novak's concept mapping practice.

Having established and legitimized the theory of concept mapping, in general, I begin to

demonstrate its practice for my interdisciplinary humanities students by using it to outline the semester's

overall goals and learning outcomes, as such. The displayed nested concept map works very well for

maintaining the course's overall structure while allowing me to expand upon subcategories. Thereafter, I

continue my presentation with an animated PowerPoint version of the same map. The animation allows

me to direct my students' reading of the map appropriately, as well as to add and subtract information.

This function will also be useful later for in-class and individual review, as the entire presentation is

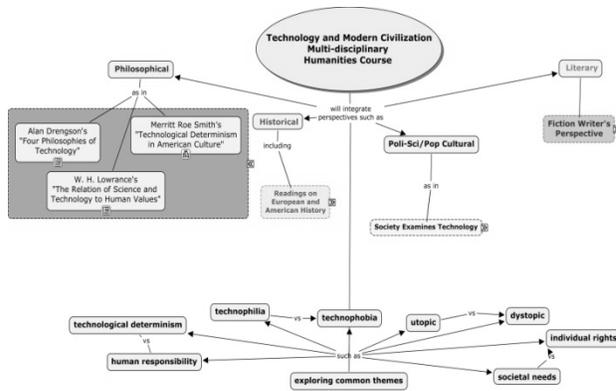uploaded to my course Blackboard site.

Fig. 2: This JPG version of the overview map shows the nested maps as well as the icons linked to additional maps and documents.
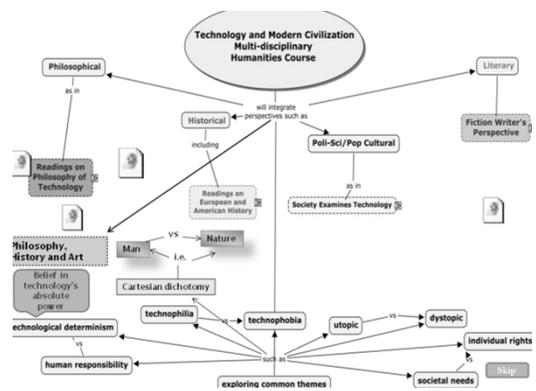
Fig. 3: In contrast, this screen capture of the animated PowerPoint map shows additional information to display and "disappear," as well as links to other slides.

While it is difficult, if not impossible, to segue smoothly from the concept mapping program to my PowerPoint slides and back, I can use cmap icons as hyperlinks to other slides into which I've inserted concept map JPGs. These links serve several purposes: initially, they allow me to preview assigned readings for my students and demonstrate their place in the overall curriculum. After students have read each of these assignments, they serve as classroom review of basic concepts. Since some of the assigned readings in my topic, technology and modern civilization, are a bit on the "thick and academic" side, this helps us all gain perspective on the writers' basic concepts and sub-concepts, as it were. Shortly, I'll follow a few of these links to connected slides and back to demonstrate how they work.

In the meantime, let me explain that this overview map and the hyperlinked slides will serve the students as review and self-assessment preparation for in-class tests and exams, including in-depth analysis in addition to short definitions. While my students are quite adept at memorizing and test-taking, as is true in most technology-oriented universities, they often struggle to find the interconnections needed to demonstrate meaningful learning. In a humanities class where writing critically about texts is required, this can pose special difficulties for our typical left-brained flight or engineering student. This makes the bottom segment of this map especially important, since it forwards discussion of the common themes tying all of the curriculum's texts together, including everything from establishing a philosophy of technology, to tracing its influence in European and American history, to its treatment in creative texts

such as film and literature. For this reason, I find it vital in previewing the curriculum to stress the common themes they will be examining, and, again, I find this PowerPoint animated concept map an invaluable tool to further that end. In addition to introducing common themes, this slide's animation also allows me to define unfamiliar terms briefly, as such. As this is one of the overriding themes in our ongoing conflict between technology and nature, I'll click this link to my introduction to the Cartesian dichotomy based on a statement from our first text-length reading, Michael Adas' *Machines as the Measure of Men*, which states, "Descartes's view . . . of animals as beings devoid of the capacity for thought or genuine consciousness was widely accepted by those who styled themselves scientists from the late seventeenth century onward. . . ." (210). Note the use of animation to highlight a word and pose a question for my students to consider. Otherwise, they would tend to skip right over such a subtle word-choice without considering its implications. Obviously, in a click and browse world, we must persuade our students to read more carefully, as in the next slide dealing with the rest of this Adas quote on the Enlightenment-Cartesian effect on European thought: "The obsession with classification . . . hardened the boundary between humans and animals and at the same time accentuated perceptions of differences within the human species" (210).

Returning to the overview map, I'll click a few of the linked PowerPoint concept maps I use to review one of our first assigned readings, Alan Drengson's chapter "Four Philosophies of Technology" from Larry Hickman's text *Technology as a Human Affair.* In our whole technology-besotted world, students at such an institution as my own are the most smitten. To counter this culture and induce a truly critical reading of technology, it is important to examine such concepts as technological determinism, technophilia, technophobia and technological appropriateness thoroughly. Even at that, I find my students clinging to their easy assumptions that technology is in charge and that is just fine. Another of their required philosophy of technology readings, W. H. Lowrance's "The Relation of Science and Technology to Human Values," from the same anthology, examines these same issues, as you can see from this review slide. Note that, through animation, I can make text appear and disappear, thus adding supplemental information without over-complicating the map, as well as classroom and individual review opportunities,

thus fulfilling Medina's dictum to repeat and review information to enhance learning. At the same time, its precise location near concept boxes in the concept map's overall structure helps to fix the association between term and meaning in the students' minds.

The final links I'd like to demonstrate from this overview map highlight the ongoing conflict between technology and nature through art, showing the intrusion of railroad trains into the sublime landscape and our growing technophilia expressed thereby, as well as the place of Douglas Coupland's novel *microserfs* in our exploration of our technology and modern civilization themes. As some of my students allow themselves to be mislead by the course's title, forgetting that this is, after all, a humanities class, it behooves me, from the very beginning, to explain why we will be reading a novel. This also highlights the multidisciplinary nature of our course in a graphic form my students can immediately grasp and accept (hopefully.)

As do those we've explored through links to our overview slide, several of our required readings stress the necessity for humans to view technology critically, live up to their responsibilities to make value-based decisions on technology and to avoid simply hopping aboard the technology-driven train in the blind faith that it won't jump the rails and wreck us all. This theme is especially critical in reading and understanding Adas' *Machines as the Measure of Men*. The text's subtitle, *Science, Technology, and Ideologies of Western Dominance* introduces the uncomfortable reality, at least it seems uncomfortable to my young and technology-besotted students, that superior technology does not drive history; human decisions about what to do with our technology drive history. On the other hand, the easy assumption that technology is in charge and the dominance of those without railroads, for instance, is inevitable, serves to let 19th century Europeans "off the hook." Adas and I both labor to shine a more critical light on our relationship to history, nature, technology and the "otherness" of indigenous peoples encountered by European explorers, aka, imperialists.

While it is a brilliant text, Adas' volume is also a very complex history of ideas. As such, it can be confusing, which makes graphic demonstration of its vast sweep of ideas through time especially useful. Here, again, both concept mapping and PowerPoint animation of the same, allow me to focus our

preview and review of his chapters on the central over-riding concepts, as you can see by the following

slide demonstration. While the scope of the book prohibits encapsulating historical change in one graphic

representation, animation allows me to introduce historical epochs and their over-riding concerns one

section at a time. The slides that follow summarize European attitudes towards "otherness," as influenced

by the Cartesian split between humans and animals, in animated PowerPoint-concept map form; then

between Europeans, others, and all of nature in the alternative graphic form of an animated Venn
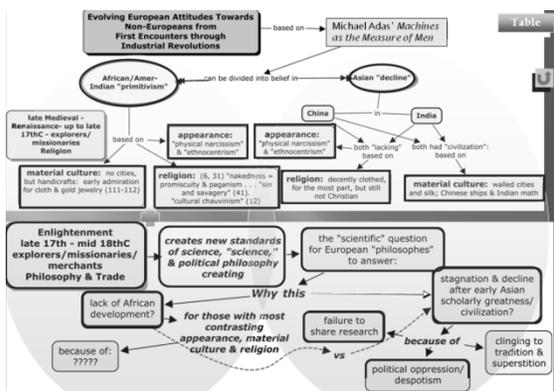
diagram:

Fig. 4: The above screen-capture shows animated text boxes and arrows that trace Adas' discussion of European attitudes towards "others" in terms of appearance, religion and material culture as influenced by time and the European Enlightenment.

Fig. 5: Here, changing attitudes explained by Adas, as influenced over time by the Cartesian dichotomy, are summarized in a series of maps which morph into an animated PowerPoint Venn diagram.

Fig. 6: Although you obviously can't tell from the above static graphic, when the above slide opens, the caption transforms from black to bright red and then spins around for extra emphasis. The graphics embedded in the table link to other slides acting as review of Adas' text. This is designed to help students gain perspective on changing European attitudes toward Asian and African cultures and their more and more practical reasons for believing they were "helping" those they conquered and exploited.

Finally, the previous table includes questions and links to help my students analyze various influences upon European thought and their attitudes towards others that allowed their cruel, yet very practical, conquest, oppression and enslavement of other races.

<u>Conclusion</u>:

As the world, and our study of it, becomes more and more "Balkanized" and fragmented, as our students distract themselves more and more with the "click and browse" world of the internet and their various technological toys, the need to help them focus and meaningfully analyze texts grows apace. It is common knowledge that our students' future employers want graduate-employees who can think meaningfully about situations and work together to solve novel problems. At the same time, the world is becoming more and more transnational, guaranteeing that many of our students will end up in far-flung corners of the world. We can help them overcome their increasingly ADHD habits and tendencies by showing them graphically how ideas intersect and how to see the world from a more multidisciplinary and a more multicultural perspective at once.

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