Ten Ways to Integrate Curriculum

These 10 models give school faculties a solid foundation for designing curriculums that help their students make valuable connections while learning.

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> To the young mind everything is individual, stands by itself. By and by, it finds how to join two things and see in them one nature; then three, then three thousand . . . discovering roots running underground whereby contrary and remote things cohere and flower out from one stem. . . . The astronomer discovers that geometry, a pure abstraction of the human mind, is the measure of planetary motion. The chemist finds proportions and intelligible method throughout matter; and science is nothing but the finding of analogy, identity, in the most remote parts.
>
> —Emerson

To help the young mind discover "roots running underground whereby contrary and remote things cohere and flower out from one stem" is the mission of both teachers and learners. Educators can achieve this mission, in part, by integrating the curriculum. The 10 models described here present ways along a continuum to accomplish this (fig. 1).

Beginning with an exploration *within single disciplines* (the fragmented, connected, and nested models), and continuing with models that integrate *across several disciplines* (the sequenced, shared, webbed, threaded, and integrated models), the continuum ends with models that operate *within* learners themselves (the immersed model) and finally *across* networks of learners (the networked model). Figure 2 briefly describes and provides an example of each of the 10 models that teachers can use to design integrated curriculums.

The Fragmented Model

The *fragmented* model, the traditional design for organizing the curriculum, dictates separate and distinct disciplines. This model views the curriculum through a periscope, offering one sighting at a time: one directed focus on a single discipline. Typically, the major academic areas are math, science, language arts, and social studies. Each is seen as a pure entity in and of itself. Relationships between subject areas—physics and chemistry, for example—are only implicitly indicated.

In middle and secondary schools, the disciplines are taught by different teachers in different locations, with students moving from room to room. Each separate encounter has a distinct cellular organization, leaving students with a fragmented view of the curriculum. A less severe model of fragmentation prevails in elementary classrooms, where the teacher says, "Now, put away your math books, and take out your science packets." The daily schedule shows a distinct time slot for each subject, with topics from two areas only occasionally related intentionally.

A high school student explained the fragmented curriculum like this: "Math isn't science, science isn't English, English isn't history. A subject is something you take once and need never take again. It's like getting a vaccination; I've had my shot of algebra. I'm done with that."

Despite the drawbacks of this traditional model, teachers can use it, individually or with colleagues, by listing and ranking curricular topics, concepts, or skills. In this way, teachers or teacher teams can begin to sift out curricular priorities within their own content areas—a much-needed first step.

The Connected Model

The *connected* model of the integrated curriculum is the view through an opera glass, providing a close-up of the details, subtleties, and interconnections within one discipline. While the disciplines remain separate, this model focuses on making explicit connections within each subject area—connecting one topic, one skill, one concept to the next; connecting one day's work, or even one semester's ideas, to the next. The key to this model is the deliberate effort to relate ideas within the discipline, rather than assuming that students will automatically understand the connections.

In middle or secondary school, for example, the earth science teacher could relate the geology unit to the astronomy unit by emphasizing the evolutionary nature of each. This similarity between the two units then becomes an organizer for students as they work through both. Teachers help students make connections by explicitly making links between subject areas.

The Nested Model

The *nested* model of integration views the curriculum through three-dimen-

sional glasses, targeting multiple dimensions of a lesson. Nested integration takes advantage of natural combinations. For example, an elementary lesson on the circulatory system could target the concept of systems, as well as facts and understandings about the circulatory system in particular. In addition to this conceptual target, teachers can target the thinking skill cause and effect as well.

Another example might be a lesson in a high school computer science class that targets the CAD/CAM (computer-assisted design/computer-assisted manufacturing) programs. As the students learn the workings of the program, the teacher can target the thinking skill of "envisioning" for explicit exploration and practice. In this nested approach, students in the computer class may also be instructed in ergonomics as they design furniture for schools of the future.

The Sequenced Model

The *sequenced* model views the curriculum through eyeglasses: the lenses are separate but connected by a common frame. Although topics or units are taught separately, they are rearranged and sequenced to provide a broad framework for related concepts.

The integrated model views the curriculum through a kaleidoscope: interdisciplinary topics are rearranged around overlapping concepts and emergent patterns and designs.

Teachers can arrange topics so that similar units coincide. In the self-contained classroom, for example, *Charlotte's Web* can accompany the unit on spiders. *Johnny Tremain* can parallel the study of the Revolutionary War. The graphing unit can coincide with data collection in the weather unit. In secondary school, one might synchronize study of the stock market in math class with study of the Depression in history.

John Adams once said, "The textbook is not a moral contract that teachers are obliged to teach—teachers are obliged to teach children." Following the sequence of the textbook may work well in some cases, but it might make more sense to rearrange the sequence of units in other cases. The new sequence may be more logical if it parallels the presentation of other content *across* disciplines.

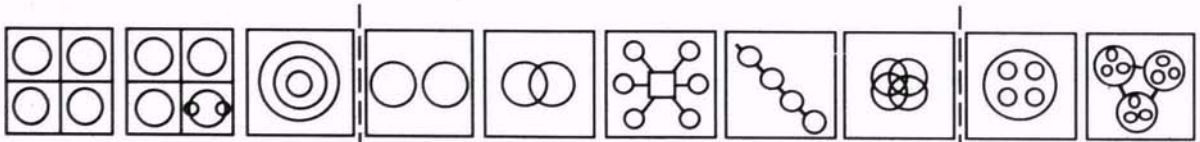
The Shared Model

The *shared* model views the curriculum through binoculars, bringing two distinct disciplines together into a single focused image. Using overlapping concepts as organizing elements, this model involves shared planning or teaching in two disciplines.

In middle and secondary schools, cross-departmental partners might plan a unit of study. The two members of the team approach the preliminary planning session with a notion of key concepts, skills, and attitudes traditionally taught in their single-subject approach. As the pair identify priorities, they look

FIGURE 1

HOW TO INTEGRATE THE CURRICULUM



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for overlaps in content. For example, the literature teacher might select the concept of The American Dream as an organizer for a collection of short stories by American authors. At the same time, the history teacher might note that his unit on American history could also use The American Dream as a unifying theme. In this way, the literature teacher and the history teacher team up to point out commonalities to students.

Elementary models of shared curriculums may embody standard planning models already in wide use. Typically, whole-language curriculums draw upon many curricular areas. The self-contained classroom teacher might plan a science unit (simple machines) and a social studies unit (the industrial revolution) around the concept of efficiency models. Teachers may ask themselves and each other: "What concepts do these units share?" "Are we teaching similar skills?"

The Webbed Model

The *webbed* model of integration views the curriculum through a telescope, capturing an entire constellation of disciplines at once. Webbed curriculums usually use a fertile theme to integrate subject matter, such as Inventions. Once a cross-departmental team has chosen a theme, the members use it as an overlay to the different subjects. Inventions, for example, leads to the study of simple machines in science, to reading and writing about inventors in language arts, to designing and building models in industrial arts, to drawing and studying Rube Goldberg contraptions in math, and to making flowcharts in computer technology classes.

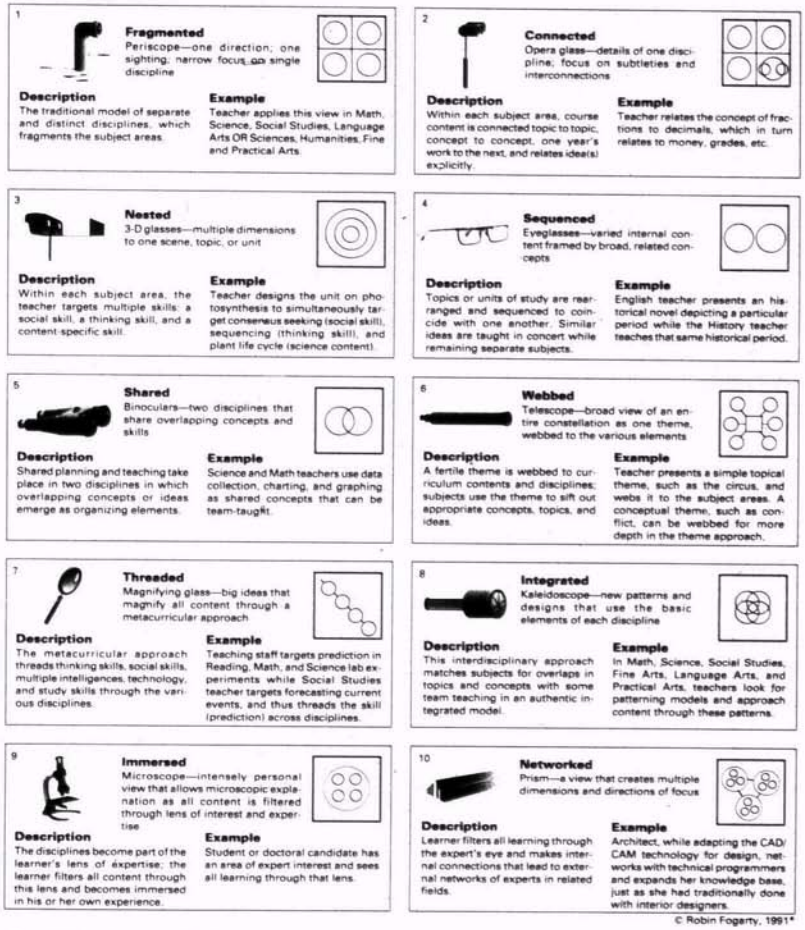
In departmentalized situations, the webbed curricular approach to integration is often achieved through the use of a generic but fertile theme such as Patterns. This conceptual theme provides rich possibilities for the various disciplines.

While similar conceptual themes such as Patterns provide fertile ground for cross-disciplinary units of study, one can also use a book or a genre of books as the topic, to organize the curriculum thematically. For example, fairy tales or dog stories can become catalysts for curricular webbing. Figure 3 shows typical lists for theme development.

FIGURE 2

TOWARD AN INTEGRATED CURRICULUM

Ten Views for Integrating the Curriculum: How Do You See It?



*Extrapolated from "Design Options for an Integrated Curriculum" by Heidi Hayes Jacobs in *Interdisciplinary Curriculum*, Alexandria, VA: ASCD, 1989.

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The Threaded Model

The *threaded* model of integration views the curriculum through a magnifying glass: the "big ideas" are enlarged throughout all content with a metacurricular approach. This model threads thinking skills, social skills, study skills,

graphic organizers, technology, and a multiple intelligences approach to learning throughout all disciplines. The threaded model supersedes all subject matter content. For example, "prediction" is a skill used to estimate in mathematics, forecast in current events, anticipate in a novel, and hypothesize in the science lab. Consensus-seeking strategies are used in resolving conflicts in any problem-solving situation.

Using the idea of a metacurriculum, grade-level or interdepartmental teams can target a set of thinking skills to infuse into existing content priorities. For example, using a thinking skills curriculum, the freshman team might choose to infuse the skill of analysis into each content area.

As thinking skills or social skills are threaded into the content, teachers ask students: "How did you think about that?" "What thinking skill did you find most helpful?" "How well did your group work today?" These processing questions contrast sharply with the usual cognitive questions such as, "What answer did you get?"

A faculty can easily work with the 10 models over time to develop an integrated curriculum throughout the school.

The Integrated Model

The *integrated* model views the curriculum through a kaleidoscope: interdisciplinary topics are rearranged around overlapping concepts and emergent patterns and designs. Using a cross-disciplinary approach, this model blends the four major disciplines by finding the overlapping skills, concepts, and attitudes in all four. As in the shared model, the integration is a result of sifting related ideas out of subject matter content. The integration sprouts from within the various disciplines, and teachers make matches among them as commonalities emerge.

At the middle or secondary school, an interdisciplinary team discovers they can apply the concept of argument and evidence in math, science, language arts, and social studies. In the elementary classroom, an integrated model that illustrates the critical elements of this approach is the whole language strategy, in which reading, writing, listening, and speaking skills spring from a holistic, literature-based program.

The Immersed Model

The *immersed* model of integration views the curriculum through a microscope. In an intensely personal way, it filters all content through the lens of interest and expertise. In this model, integration takes place *within* learners, with little or no outside intervention.

Aficionados, graduate students, doctoral candidates, and post-doctoral fellows are totally immersed in a field of study. They integrate all data by funneling them through this area of intense interest. For example, a doctoral candidate may be a specialist in the chemical bonding of substances. Even though her field is chemistry, she devours the software programs in computer science classes so she can simulate lab experiments, saving days of tedious labwork. She learns patent law in order to protect the ideas for her company and to avoid liability cases.

Likewise, a 6-year-old writes incessantly about butterflies, spiders, insects, and creepy-

FIGURE 3

THEME DEVELOPMENT IDEAS FOR CURRICULAR WEBBING

CONCEPTS	TOPICS	CATEGORIES
freedom	The individual	animal stories
cooperation	Society	biographies
challenge	Community	adventure
conflict	Relationships	science fiction
discovery	Global Concerns	the Renaissance
culture	War	Medieval times
change	The Pacific Rim	the Impressionists
argument & evidence	Partnerships	Great Books
perseverance		

crawlies of all sorts. Her artwork is modeled on the symmetrical design of ladybugs and the patterns of butterflies. She counts, mounts, and frames bugs; she even sings about them. Her interest in insect biology is already consuming her. The books she chooses reflect her internal integration of information around her pet subject.

An immersed learner might say, "It is a labor of love. It seems that everything I *choose* to pursue with any fervor is directly related to my field." Just as writers record notes and artists make sketches, immersed learners are constantly making connections to their subjects.

The Networked Model

The *networked* model of integration views the curriculum through a prism, creating multiple dimensions and directions of focus. Like a three- or four-way conference call, it provides various avenues of exploration and explanation. In this model, learners direct the integration process. Only the learners themselves, knowing the intricacies and dimensions of their field, can target the necessary resources, as they reach out within and across their areas of specialization.

The networked model is seen to a limited extent in elementary schools. Imagine a 5th grader who has had a keen interest in native Americans since his toddler days of playing cowboys and Indians. His passion for Indian lore leads him into historical readings—both fictional and nonfictional. Aware of his interest, his family hears about an archeological dig that recruits youngsters as part of a summer program. As a result of this summer "camp," this learner meets people in a number of fields: an anthropologist, a geologist, an archeologist, and an illustrator. Already this learner's networks are taking shape.

Using the Models

Whether you are working alone, with partners, or in teams, the 10 organizers presented here can function as useful prototypes. In fact, a faculty can easily work with them over time to develop an integrated curriculum throughout the school. Each staff member or team might choose one model to work with each semester. As teachers begin the conversation about integrating the curriculum, they can work with the models to explore the connections within and across disciplines and within and across learners.

These models are just beginnings. Teachers should go on to invent their own designs for integrating the curriculum. The process itself never ends. It's a cycle that offers renewed energy to each school year as teachers help the young mind discover "roots running underground whereby contrary and remote things cohere and flower out from one stem." □

Author's note: For more information about the models described here, please see my book *The Mindful School: How to Integrate the Curricula* (Palatine, Ill.: Skylight Publishing, Inc.), from which this article was adapted.

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