When and where to use *Introduction to Systems*

Imagine a school year for middle school-aged learners when separate classes in language arts, science, social studies and even math are replaced by a single course lasting a couple of hours each school day. (Note: That's not the only possibility; others are listed below.)

During this class, small teams of learners actively investigate the real world instead of second- or third-hand versions of reality in textbooks or other sources. They write, read, calculate, draw, photograph, interview, experiment, discuss, and present conclusions. They compare, contrast, find relationships, hypothesize, analyze, synthesize, value, and so on—the full range of mental processes.

The skills emphasized in the usual core courses aren't ignored. Teacher teams evaluate performance—the level of each learner's comprehension, the effectiveness of writing—all the usual academic skills.

But a great deal more is going on. Students are building mental tools for making sense of the complexity that surrounds them by focusing on patterns, relationships, and systems. And they're erasing the artificial boundaries between fields of knowledge erected by conventional instruction.

Not incidentally, students—even the ones that often perform far below expectations—are motivated to participate. Assumptions about ability frequently change when the task is making sense of real-world experience rather than merely interpreting text *about* that experience.

That's our aim in *Introduction to Systems (IS)*.

Merging *Introduction to Systems* into the Curriculum:

If logic determined the content of the general education curriculum, *Introduction to Systems*, or something very much like it, would surely be its mainstay.

Purposeful human action originates as a state of mind. And of those states of mind, the largely unexamined assumptions or premises shared by the members of organized human groups are central. Every school subject, every course in every college catalog, every field of study, every project, every art, every science, has its origin in, and can't be adequately understood, apart from the content with which *IS* deals. It's "basic education" in the best sense of the word.

But of course tradition, not logic, determines the content of the curriculum, so potential users will have to devise ways to introduce the course of study. Finding a place for *IS* in the curriculum, and getting permission from those in authority to allow its use, will be a formidable problem for many.

Just to begin a list of possible problems: Change is inherently difficult; the assumption that the core curriculum "covers" essential knowledge is deeply rooted, and has been powerfully reinforced by the corporately driven "standards and accountability" fad; the merits of integrating knowledge aren't obvious to teachers educated in schools that fragment knowledge; administrators are rarely initially supportive; the innate abilities of the young are routinely underestimated; educating has traditionally been seen as merely transferring information from those who know to those who don't know.

Introducing *Introduction to Systems* will be difficult, but here are a few possibilities:

1. Much of *IS* focuses on societies and culture, thus fits quite well within the broad reach of social studies. Substituting it for one of the standard social studies courses in middle school or above is an important possibility.
2. In every school, there are kids at both ends of the performance spectrum who are so poorly served by the traditional curriculum that administrators often wish they'd just disappear. *Introduction to Systems* works equally well for both groups, and used as intended, its scope and sequence far surpass the traditional "core."
3. American history is taught in nearly every school. *Investigating American History* is sufficiently orthodox to be acceptable to most history teachers. Use of it, along with the associated student materials, could anchor subsequent movement of other faculty toward *Introduction to Systems*.
4. The content of language arts is "loose" enough to allow the use of *IS* as a primary organizer. No one can deny the linkages between language, literature, and the concept of culture as *IS* develops it.
5. For science, the simple but comprehensive categories for systems analysis presented early in *Introduction to Systems* (up to Part 2, page 8) provide organizers that help learners cope with seemingly random, disconnected, hard-to-remember information. And, of course, "investigating" reality firsthand is far closer to true science than trying to remember secondhand information from a textbook.
6. In some schools, there's enough latitude at the 12th grade level to permit use of *Introduction to Systems*. Its ability to "tie everything together" will be apparent.
7. Where there is sufficient flexibility and vision, *IS* may be used as a single course to satisfy multiple "core course" requirements, as described above. If this is done, its use can actually free up time in the school day for other learning possibilities. There's broad agreement that physical movement, art, music, community service, individual and team projects, apprenticeships, civic involvement, and so on, make major contributions to intellectual development and growing maturity. Integrating core knowledge, as *IS* does, provides efficiencies that allow individualization of instruction to a degree never before possible.

Using *Introduction to Systems*

Introduction to Systems requires no specialized knowledge or advance preparation, but it's necessarily unorthodox. As Albert Einstein pointed out, problems can't be solved with the same kind of thinking that created them. What's required is primarily teacher willingness to back away from the usual teacher role of "expert." *IS* is genuinely learner centered, and learners must be allowed to lead, must be encouraged to talk to each other. Teachers must be silent as learners think, argue, struggle with issues that often have no good or right answers, and see the real world as it presents itself to them at every moment as the main "textbook."

The most productive role the teacher can play is that of "co-learner."

In preparing *IS*, we visualized classes with learners in the range of grades 7-10, with a team of two or more teachers, but from experience we've learned it will work with learners outside this range.

We believe in team teaching. For schools open to teaming, *Introduction to Systems* erases the arbitrary boundaries between fields of study, makes them mutually supportive, and gives team members a shared conceptual foundation and "language."

IS requires learners to do significant amounts of purposeful reading and writing, and a language arts teacher could and should work with students on those parts of Investigations as part of the teaching team. With proper attention to details of information gathering and reporting, *IS* can contribute significantly to the development of language arts skills, and the journal that students keep can be a major way to evaluate those skills.

Similar roles may be played by teachers in other subject areas. For example, a great deal of measurement and calculation is required for some investigations, particularly those involved with the "target area." One of our pilot classes, made up entirely of turned-off, poorly achieving and math-phobic students, when given the "Target Area" assignments, willingly took on the challenge of solving the associated mathematics problems on their own. Those math problems were perceived as related to the real world, and thus had a definite end and purpose for the learners, helping to change their attitudes toward mathematics. Though there's not enough math in *IS* to satisfy math course requirements, it's *functional*.

The investigations, particularly in the first part of the course, are heavily weighted toward science, and may be supplemented by other investigations and experiments. Further, the system model suggested on Part 2 page 5 of *IS* can be applied, over and over, to whatever aspect of science is being studied in any science class at any level. It provides an "ecological" approach to the study of everything from atoms to galaxies, from whales to microbes, and provides the conceptual structure to "make sense" of large masses of information. Without this structure, science (and other traditional "core"

courses) tend to link poorly or not at all and soon disappear from short-term memory.

Introduction to Systems can also offer opportunities to develop other skills which are important in the real world but aren't ordinarily considered the school's responsibility. An example: Learning to communicate effectively with learner-prepared pictures and diagrams, including photographs, sketches, graphs, maps, flowcharts, and the like.

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Main webpage for *Introduction to Systems*