There Are No Ends, Only Means

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In this ambitious article, Mitchell asks us to rethink in a fundamental way a number of assumptions about what educational technology is, and what it is good for. The principal suggestion is that systems analysis be rejuvenated as a conceptual model for further work in the field, with the addition of control system theory as a way of recognizing that interactions in social systems are rarely one-way. Adding to our armamentaria the notion of mutually determining control systems (instructor on learner and learner on instructor), Mitchell maintains, can provide a new, more useful conceptual framework for educational technologists.

Just as important as an improved model for work in our field, Mitchell believes, is the need to move away from the insignificant to the profound. We must abandon our present focus on tiny issues which have little overall impact on the educational well-being of learners (and which therefore exist comfortably within the current system of education), and work toward a deeper and more significant commitment to "real educational problems. . . illiteracy, innumeracy, intolerance or lack of caring" (p. 23).

In Mitchell's analysis, the improvement in systems thinkingto be achieved by the addition of control theory is the means to achieve the end of an enhanced ability to deal with meaningful problems. I agree on the ends; I disagree on the means. And, as the title suggests, means are what most of us deal with most of the time.

The future of systems theory is past. In the early 1970s educational technologists (like many others) became enamored of systems theory and systems analysis. This new approach, synthesized from such diverse fields as mathematical modeling, economics, and military operations research, seemed to offer a way around the intractable complexity of social problems. By seeing things whole, systems theorists argued, we might cope with the difficulties encountered in trying to solve a myriad of small, interrelated problems simultaneously. Educational technologists, searching desperately (and apologetically) for a way out of the blind created by years of NSD results from classical experimental research, saw "the systems approach" as an answer.

Unfortunately, we have kept our faith in systems theory while others all around us have been losing theirs. The critiques have been various, and have included objections to the philosophical and mathematical assumptions underlying the stance of the systems proponents (Berlinski, 1976; Lilienfield, 1978), the impossibility of predicting significant policy shifts that ramify across systems (Ayres, and the conceptual adequacy of the model of reciprocal determinism that underlies much of systems theory in general, and

control theory in particular (Phillips & Orton, 1983). Even systems theorists themselves have begun to discuss these problems openly, and have suggested there may not in fact be a single systems approach so much as a variety of such approaches (Carvajal, 1983; Tomlinson & Kiss, 1984).

The current interest among scientists in "fuzzy sets," "loosely coupled systems," and "chaos theory" does suggest a continuing attempt to understand how complex phenomena in the real world are related one to another. But these efforts also underline how different the task is when one confronts problems in a physical, rather than social, realm.

System theory and educational reality. Are the differences really so profound? It is significant that education has witnessed a corresponding decline over the past several years in the popularity of approaches predicated on the discoverability of large-scale panaceas to problems of instruction. Perhaps the best indication of this shift is seen in the new demand that more qualitative and ethnographic approaches be used to study the peculiarities of instruction in different settings. While the proponents of such methods certainly do not rule out (and many would find desirable) trying to understand the interconnectedness of instructional approaches and the environment in which these take place, most would probably say that it is far too early to suppose we can accurately identify all the factors involved, much less describe how they effect one another.

The problem of trying to apply systems theory to research and practice in education is that, unlike physical systems where laws may be assumed to underlie observed events, the variables affectinginstruction are presently less amenable to a simple physical description. Conceptions of learning, definitions of curricular content and structure, models of instructional methods, approaches to monitoring and evaluating educational results, ways of delivering and administering educational services – all these are subject to multiple definition based only partly on purely scientific phenomena. Even the purposes of the educational system itself are subject to a greater share of political and social influence than educational researchers or educational technologists are often prepared to admit (cf: the "equity vs. excellence" debates that flared in the United States after the first round of educational reform reports in the early 1980s).

These educational realities appear to me to make several of Mitchell's assumptions quite dubious: that educational technology should rightly be devoted to a search for educational efficiency and "optimal organization" (What of those who see its purpose lying in other spheres entirely-the aesthetic, for example, or the enhancement of students' abilities to explore alternatives?); that the purpose of education is to "provide access to stored human experience" (What of the socializing functions of schools that many parents put on a par with acquisition of information? What of the descriptions of economists that stress the role of schools in controlling access to the labor market?); that educational technologists can easily find ways to deal with the "real problems" of "intolerance or lack of caring" (What of the difficulties of defining

ance for what?" and "lack of caring for *whom?,"* in a context where increasing numbers of parents are removing their children from the educational system because they disagree with the kinds of answers schools have often provided to these questions).

The search for appropriate means. I need to reiterate: I agree with the ends Mitchell identifies as being important for educators to work towards, but I disagree seriously about the means to get there from here. I doubt that we are as yet anywhere near the point where we can reasonably talk about formulating what we know about education or educational technology in terms of a general "systems approach" to the important educational problems of our time. Educational technologists concerned to do something significant about those problems would be well advised to seek to deal in more complex ways with the meanings their craft has for teachers and students, and with the political and social diversity of the educational system. Technologists, in short, need to become educational practitioners, working in classrooms with teachers, as well as activists versed in the political and social context of the educational system. Working from within in this way will have more significance over the long term than seeking to reform from without via a broadly conceived systems approach to educational technology and instruction.

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