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RESEARCH FOR EDUCATION

A DIALOGUE BETWEEN R. W. LAWLER AND OLIVER G. SELFRIDGE[1]

Bob American society has been undergoing major transformations from the electronic revolution, from nuclear family fragmentation, from the disappearance of minority role models in the education system, and even from changes in social perceptions of the value and necessity of labor. It is very clear that America's public education system is in trouble. I have committed a large part of my life to work in the area, and I wonder whether the educational technology community can develop innovations of real value as opposed to projects whose primary outcome is career advancement. What are the problems?

Oliver There's no clear answer. We need to ask fundamental questions about issues relevant to education. We need to ask what learning consists of in kids and in grownups. Is teaching a foreign language different from teaching arithmetic? I think it probably is, in all the important details. Is there anything at all conceivably general about instruction? I think not, but if somebody wants to look at that, let him look. What kinds of games can we play which will make it attractive for kids or grownups to learn something? How do we understand and measure motivations? How do we put together a vocabulary that will permit us to talk consistently about motivations and motivation structures?

Finally, we have to ask organizational questions. How do we fit all those questions together in a way that can be thought about and that can be a base for research? Without a generally accepted base, we won't

[1]This dialogue went to press before the announcement of President Bush's education initiative, so it is not discussed here. The issues raised remain current.

get any kind of durable change. You've mentioned a lack of role models. Well, teachers need them too, and they need to see research being done by great people. Even if it doesn't apply directly, such research will surely make teaching easier and more effective.

DIDACTIC AND CONSTRUCTIVE VIEWS

Bob Educators generally view knowledge as something to be transmitted from one person to another. My sense is quite different, that self-construction by the student of his own knowledge is central. We need to develop constructive alternatives to students "getting taught." Years ago in a BYTE magazine article, I claimed that "the central question of education is how one can instruct while respecting the self-constructive character of mind." I still think that's true, but I need to develop some more explicit and better articulated description of my answer. There are of course many proponents of this viewpoint.

Oliver None of us has a competent expression of what education's about. And if we had, it still wouldn't face up to problems of others' views because it won't face up to their values, depending on whom you're talking to. Education is not like a problem in physics with something to be solved. It's about how to make things better. It's a control process that we're worrying about. Being precise is difficult because we're aiming at the high-level issues, like respect for learning and the applicability of learning outside the schools.

Just to take issue with what you said, an important question is the extent to which knowledge is stuff that is transmittable by a teacher at all. Clearly some is, some isn't, and some can go either way. Telling someone, however accurately, how to ride a bicycle is no help; a teacher, or better yet a parent, *can* help a child learn, but not by transmitting knowledge. That Sofia is the capital of Bulgaria is most easily transmitted from a teacher or, equivalently, a book or an atlas; and there is no way that a child can *derive* it just by thinking about it, the way he can discover arithmetic facts. I think that probably educators know all this too. But your point is well taken.

"SHOULD" QUESTIONS

Bob Let me raise one possible kind of education problem with an example. As a child my son seemed to have some natural talent for singing—which could have been developed for his own life-long satisfaction. In such a situation, what would be the right thing to do?

Oliver That's a "should" question. It has to do with what is worthwhile.

Bob For me, that's a reasonable question: What are the worthwhile things?

Oliver Well, in some sense it isn't a reasonable question in that there isn't an answer. I mean, it's not a question that can be argued about; it's an expression of your own values, a different kind of question. Is it worthwhile to make money? Surely, for many reasons. Is it worthwhile that making money is the overriding justification for everything? Not for me, and, I am sure, not for you. My primary should is different: to find out the truth about the world.

Here's another example of how to think about education.

EDUCATION IS NOT PHYSICS

Oliver At a conference recently someone said we need "a physics of software." Such a problem is not feasible, because in software there aren't any physical truths with which you can get as accurate as you want by trying hard enough; and not only accurate but precise, with physical laws which are real laws instead of tendencies. I'm sure education is very much more like software than physics, even if there is some precision to be had. With respect to any vision of educational innovation, we must realize that the physical sciences are very special and limited, and thus provide generally a poor archetype. In physics, things work because you can narrow down consequences and bound them, and look down into detail. The accidents of context do not have much affect on the outcome of lawful relations.

In education, we can't do that; to discuss a vision of education means we have to look upwards to purposes and values at least as much as downward to detail. We must ask what kind of society do we want and do other people want, and even what will other people want after they've been well educated. To present a dream about education is to ask what culture is about; and to ask what cultures will be about or be wanting; and to ask what the distribution of human goals is going to be. This isn't to say such questions are not answerable. It's essential to ask such questions, but the process of creating answers is going to be rather difficult and quite different from doing a hard science.

Bob Your friend Von Foerster said it very well, "The hard sciences appear hard because they tackle soft problems. The soft sciences face the harder problems."