

Afterthoughts on a Seeming Didactic Paradox

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The first part of this contribution consists in an off-the-cuff reaction to the presentation by Judith S. Lederman, Norman G. Lederman, and Per-Olof Wickman of their study of inquiry-based *versus* direct instruction. The second part was written some time later. It aims to open up a passage allowing educational research relating to the “inquiry” paradigm to free itself from the dictums of an increasingly invasive administrative ethos.

1. First thoughts on a comparative case study

My reaction to Judith, Norman, and Per-Olof’s presentation will consist in a small number of short, straightforward remarks.

1.1. First remark

When Gérard Sensevy, on behalf of the organizing committee, asked me to react to this presentation, I thought it was a nice opportunity for me to deal with a topic not too distant from my own current research interests. I happened to realize only too late that this was a very naive view of the situation that would follow from my accepting his proposal.

1.2. Second remark

I was indeed a bit surprised when I came upon the main result of the study presented — no significant difference found between what the authors call “direct” and “inquiry-based” instruction. Then I realized that this seeming paradox could result from the very notions involved, direct as opposed to inquiry-based instruction. Understandably, it first occurred to me that contrasting one with the other was very similar to comparing the width of two pieces of plasticine, something I was inclined to regard as a scientific prowess.

1.3. Third remark

Looking briefly at the literature on the subject of inquiry-based instruction didn’t throw much light on the problem I faced: the plasticine paradox was still there. Later on I stumbled upon a passage in the written account of the presentation that tried to specify the entities being compared. On the one hand, direct instruction was defined as follows:

Teacher presents a definition, concept, principle, generalization, etc. Teacher clarifies terms/vocabulary.

Teacher presents examples and non-examples of the definition, concept, principle, generalization, etc.

Students make verifying observations. Students identify and/or present examples and non-examples of the definition, concept, principle, generalization, etc.

On the other hand, inquiry-based instruction was depicted thus:

Teacher presents a demonstration, illustration, problem, or has students directly experience some scientific phenomenon. Students speculate or hypothesize about possible solutions or explanations. Students actually test/investigate or discuss how they would test their hypotheses or speculations. Students arrive at a consensus for the concept, principle, or generalization. Teacher provides additional “experiences” and asks students to apply the generalization they have learned to these new experiences.

It is at this point that it dawned on my mind what the real problem could be.

1.4. Fourth remark

To make clear what occurred to me, I must now indulge in some theoretical views of mine. My current research framework is provided by the so-called “Anthropological Theory of the Didactic”, which has been around for some time now — almost two decades. In this framework, a key notion has emerged a few years ago, that of *enquête*, a French word (akin to English *quest*) meaning *inquiry* or *investigation*. The crux of this notion is expressed through some symbolism which, however briefly, I have to introduce now. A *didactic system* is a social arrangement $S(X; Y; Q)$ in which X is a group of persons studying question Q in order to build up some answer A under the guidance or supervision of a “team” Y (in fact, Y as well as X can be made up of just one person), or simply with some help from Y . The aim of it all is to bring into being ($\Rightarrow$) some answer A to question Q which will satisfy a number of constraints, so that we usually denote it by adding a small heart ($\heartsuit$) at the top right of letter A , as can be seen here: $S(X; Y; Q) \Rightarrow A^\heartsuit$.

1.5. Fifth remark

The aforementioned formula must be expanded by adding to it the letter M for “(didactic) milieu”, as follows: $[S(X; Y; Q) \Rightarrow M] \Rightarrow A^\heartsuit$. M is a fuzzy and changing set of didactic “tools” of different kinds that X , acting under the supervision of Y , has to bring together ($\Rightarrow$) in order to use them to create answer $A^\heartsuit$. The full expression of M is seen below, in cabalistic signs that I shall now make clear — as far as I can in such a short presentation.

$$M = \{ A_1^\diamond, A_2^\diamond, \dots, A_m^\diamond, W_{m+1}, W_{m+2}, \dots, W_n \}$$

The symbol A followed by a small rhombus ($^\diamond$) may be read “A diamond”, the rhombus being regarded generically as denoting the hallmark of some institution: a teacher (at least in direct instruction) or a textbook or a webpage are thus institutions that hallmarks answers to the questions they tackle. Now part of what the whole formula means is that X comes to $A^\heartsuit$ using existing, hallmarked answers $A^\diamond$. Obviously, X also uses many other “tools”, such as theories,

experimental set-ups, or what have it — each of these tools being here generically denoted by the letter *W*.

1.6. Sixth remark

When inquiring about question *Q*, one will surely inquire about existing answers: this is what scientists would do, as well as any reasonable layman outside the classroom. For example, if I inquire about acids and bases, one thing I can do is attend a lecture on acids and bases, or read some written account on that matter. It should therefore be clear that what has been described as a piece of *direct* instruction is but a grassroots means to know a little more about what one is *investigating*. My conclusion is that inquiry, in “*my*” sense, comprises necessarily episodes labelled “direct” as well as episodes labelled “inquiry-based.” Both of them are part and parcel of the same process, that of inquiring. I will listen to people, read papers, do things, just to achieve a unique goal — to create a “satisfactory” answer *A*♥ to question *Q*.

1.7. Seventh and last remark

It is time for me to conclude — provisionally. My own conjecture, if I may say so, is that both kinds of didactic episodes draw on what many students of inquiry-based instruction call “inquiry skills”, which, in my view, do belong to *any* genuine process of study and research. Now the problem that remains open is that, beneath the surface of what is held to be “direct” or “inquiry-based” instruction, we need a deeper, critical analysis that would allow one to understand how the seemingly differing didactic organizations largely coincide in the skills and bodies of knowledge they require from the learner, or force the learner to develop, in order for that person to cope successfully with the didactic situation he or she is supposed to go through.

2. Second thoughts on “inquiry-based instruction”

2.1. An old American tradition

The information so lively presented by Judith, Norman, and Per-Olof depicts a clear-cut, energy-consuming, and instructive empirical research study that puts forward what sounds undoubtedly as a sobering result for educators with a penchant for inquiry things. This result, however, remains problematic as to its didactic meaning. It is one of a number of empirical results that challenge what had become the latest fad in the long and venerable history of American pedagogy. Indeed, as is well known, “inquiry-based teaching” is frequently traced back to (at least) John Dewey’s *How We Think* (1910), Jerome Bruner’s “The act of discovery” (1961), or Joseph J. Schwab’s “The teaching of science as inquiry” (1962). (Schwab, for example, wished that “in the very near future a substantial segment of our publics become cognizant of science as a product of fluid enquiry.”) This time-honored tradition is the first part of a pedagogic epic of which, in my view, it is the best part.

2.2. Inquiry and the *National science education standards*

The peak of the story, it seems, took place in 1996 when the National Research Council released the *National science education standards*, a main tenet of which is that “inquiry into authentic questions generated from student experiences is the central strategy for teaching science.” One quote from this epoch-making catalog deserves to be mentioned here:

Inquiry is a multifaceted activity that involves making observations; posing questions; examining books and other sources of information to see what is already known; planning investigations; reviewing what is already known in light of experimental evidence; using tools to gather, analyze, and interpret data; proposing answers, explanations, and predictions; and communicating the results. Inquiry requires identification of assumptions, use of critical and logical thinking, and consideration of alternative explanations.

If I understand correctly, this “definition” is quite in agreement with what, within the framework of ATD, I have been pushing forward for some years now under the name of *parcours d’étude et de recherche* (PER), a phrase rendered into English — albeit awkwardly, it seems — as *study and research course* (SRC). Let me stress in particular that the passage from the *National science education standards* quoted above mentions a kind of didactically crucial act which, obviously, has been to a large extent forgotten by modern propounders of inquiry-based education, that of “examining books and other sources of information to see what is already known.” Indeed, doing so plays a key role in the discovery of already existing answers (the $A^\diamond$ in the Herbartian formula), that is to say of what I will describe, contrary to the *National standards*, not as “what is already known” but as “what is already pretended.”

2.3. The slow rise and swift fall of inquiry

What I call *inquiry* is exactly what the formula already mentioned — the *Herbartian formula*, so called after the German philosopher and pedagogue Johann Friedrich Herbart (1776-1841) — tries to convey, i.e. a search for a validated and valuable answer $A^\heartsuit$ to some question Q . An SRC is that particular path that the study community X will have followed to go from Q to $A^\heartsuit$. In doing so, X will have come across many didactic tools, as I dubbed them, first searching for (supposedly) relevant ones and then studying them to achieve sufficient mastery to complete their research. How Y will have “conducted” this research is not specified — voluntarily. But it is at this point that, in the years following the *National science education standards*, an almost surreptitious but strongly consequential change occurred in the inquiry epic: somehow, it was realized that, if teachers were to go in for “inquiry-based teaching”, this open-ended, generous, happily amorphous notion had to quit its original floating garment to put on tight clothes — such as those sketched above by the authors. Such a destiny — formal standardization — was in no way a *scientific* obligation. But it was automatically imposed upon advocates of “inquiry-based instruction” by their will to diffuse far and wide the new, at first loosely defined, way to teach. It is my view that, in doing so, they inadvertently distorted the ideas brought along by the old American pedagogic tradition about

inquiry. The first step in this process was to simplify the “formula” of inquiry-based teaching to make it easier to construe and enact. Thus, in a recent paper (Warner & Myers, 2008), the rich formulation put forward in the passage reproduced above boils down to the following skimpy statement of principles (in which, most notably, “already existing answers” have been disposed of): “According to the National Academy of Sciences (1995), when students learn through inquiry, they: 1. question; 2. investigate; 3. use evidence to describe, explain, and predict; 4. connect evidence to knowledge; and 5. share findings.”

2.4. Shared didactic skills

In the same course, “direct instruction” had to be reduced to a diminished reality. In this respect, however, much of the work had been done beforehand to depreciate the emblem of traditional teaching, the lecture delivered by the teacher, in which students have been stupidly supposed to be caught inescapably in a passive role — while, much to the contrary, it behooves them to actively and critically make sense of the lecture, deconstruct it and adequately process the information brought before them. This is why, in my “first thoughts” (above), I insinuated that most — not *all* — basic didactic skills, erroneously purported to be the privilege of inquiry-based instruction, are the common good of almost every way to teach and learn, a fact that the didactic oversimplification of the two teaching paradigms that it has become pedagogically correct to put in opposition tends to obscure. This, undoubtedly, explains part of the paradox raised by the result considered here. But there is more to it than that.

2.5. Toddling toward the true demise of knowledge as dogma

To conclude valuably, against common opinion, that the observed effects of two “teaching methods” are almost indistinguishable, one has first to mark them as different. In the case in point, this is done — as is usual — through “algorithmic” definitions which always run the risk to miss what they are intended to capture. In this perspective, and to make a long story short, I have to make a little more explicit the logic behind the research I am involved in. To reduce a potential, budding didactic paradigm to a clear-cut definition is a scientifically legitimate way to prove that this nascent reality *cannot* be shoved into that definition. Inquiry-driven teaching (IDT), as I understand it, is, if I may say so, a yet unfettered concept, which remains open to research. Let me give here a key example. One may expect “genuine” IDT to generate in most students the capacity to question even what the teacher pretends to bring forth to them, including the evidence adduced, the teacher’s answer to question Q being regarded only as the first among many “institutional” answers $A^\diamond$. In other words, IDT should in the long run rid students, and teachers, and the citizenry, of all hint of dogmatism in their relation to knowledge and to learning. This, in my opinion, is what researchers around the world should now head for.

References

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