Does knowledge count?

Inquiry-based learning in the elementary school system in Israel

Evaluation findings

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Historically speaking, inquiry-based learning has been part of the Israeli educational system since its very beginning in the 19th century. This was the time the modern educational system started to emerge, and in addition, there were waves of newcomers eager to explore the land: to sort the flora and the animals, to learn the geography, geology and archeology, to create the language (Hebrew) and to understand the variety of cultures.

My grandmother and mother have told me how, besides the required world literature, geography and history, most of their formal learning took place outdoors. When I was at school, almost half a century ago, we did our own experiments, especially in agriculture, trying to acclimatize plants (and people) to the dry, hot weather of the area.

That was a real need at the time, and in a way, the educational system, teachers and pupils were an essential part of building life in the new environment—in other words, "researching" the new environment. It was for real.

What was also for real were the teachers. In a revolutionary society, the teachers were the leaders of the revolution. They were the elite of society: highly educated scientists, novelists, researchers, linguists and so on.

Over a hundred years have passed but not the idea of inquiry and research as an integral part of everyday life at school. And I am not talking about isolated lessons in a laboratory, but an overall attitude and practice that overarches every corner of life at school. That's the ideal type. The viewpoint is that of "a culture of inquiry rather than inquiry-based teaching or learning. That means a way of thinking and not a slot in the lesson timetables. In the typically circular way ideas develop, this concept is now related to post-modernism, constructivism and knowledge creation and management instead of canonical knowledge to be taught and rehearsed. Post-modern students have to know where to look for and how to deal with the knowledge they require rather than owning it themselves.

Thus, the ministry of education in Israel decided to encourage schools to develop their own culture of inquiry. It is important to mention that computer-based learning (especially in languages and the sciences) or the fact that pupils make experiments in a laboratory are not in themselves perceived as "inquiry-based learning" because they are very structured and don't ask pupils to use their initiative in forming questions and looking for ways to collect data. In the sciences, for example, observations of the eating or mating behavior of animals at the zoological garden will fall under this category.

At the request of the Ministry of Education, a nationwide evaluation was conducted (2002-2003), which showed the following:

1) <u>Inquiry-based learning has a broad influence</u>.

   a) In most schools (96% in our sample), we found inquiry-based learning, often at different levels of intensity.

   b) Most teachers, pupils and parents love and enjoy it. They all perceive it as very important.

   c) The main impact is on the teacher's role, changing from the main source of knowledge to coordinator and supervisor of the children's work.

   d) Parallel changes occur in the children's ways of learning—from passive absorbers to active creators of knowledge.

   e) Activities within schools are very vivid and joyful and include such creative things as shows, exhibitions, contests and open days. Children are allowed to choose their own way of presenting their new knowledge.

   f) Many activities are done out of school: interviews, photography, painting or observation.

   g) All this really changes the school atmosphere: parents are more involved, there is interdisciplinary teaching: we observed a lot of interdisciplinary learning (history + art + geography + literature) and even issues that are not related to any discipline.

   h) Traditional class structures, time frames and discipline are broken on many occasions.

2) <u>A good, efficient supporting system has been established by the Ministry</u>. It includes learning days, pedagogical instructors, supervisors, workshops and other supporting activities and resource people.

3) <u>As to pupils' learning levels, inquiry-based learning is far from fulfilling its potential</u>. Products are often uninteresting and trivial. The knowledge the children acquire is dull and simplistic and, on many occasions, wrong.

   a) The research practices applied are usually incorrect (A common example is generalizing a conclusion after calculating a percentage from four interviewees: interviewing four people in a mall, from which three said they like to buy in the mall and the fourth that he buys occasionally, after calculation 75% pro 25% more or less – the conclusion "most people like to buy in the mall." Most teachers don't understand what is wrong with the whole process).

   b) The resources in most cases are trivial (internet and encyclopedia). Most products are cut and pasted from these resources without further processing—like integration or merging of sources, discussion about the sources, criticizing them, comparing one source with another or asking questions about them.

   c) In spite of the rhetoric on "learning processes," most teachers emphasize the products. They lack the tools for evaluating the process of inquiry.

4) <u>The teachers (in elementary schools) don't know what research is, they never experienced it, and they know nothing about research methods</u>. The same is true for the Ministry's pedagogical instructors and supervisors. They do know pedagogy but not research. Researchers from academia or private institutions who are invited for a lecture or even a workshop can't fill the gap between what there is and the real needs.

   a) Most of the work done by teachers and pedagogical instructors deals with "what shall I do in class tomorrow morning?" At many schools, however, teachers work

internally in unguided groups of colleagues, trying to sort out solutions to teaching problems.

b) There is some confusion about inquiry-based learning. There are many meaningless "buzz words," "folk epistemologies" and slogans: e.g., "our lives are one hell of an inquiry…learning is inquiring…we deal with life really." Everyone talks about "constructivism"; constructivism is perceived as good, as the right way. (Why? What does it really mean?) But the main practices are quasi-(bad)-positivistic and most teachers or supervisors couldn't tell one from the other. The main positivistic claim that "Knowledge is the collection of the correct facts" is a common saying among teachers and instructors, although in different words.

c) The same is true for research procedures. The working steps are similar for most teachers and schools: brain storming, concept mapping, raising questions, data collection (from different sources), doing "something" with the data (in most cases a written paper or a "Power Point" presentation).

What we have found is a paradox: we have a successful renewed initiative where the ideas have percolated through the whole system. A supportive framework has been established, everyone is happy, and important changes have taken place. But we find problems in the understanding of the very essence of research: there is no discussion of epistemological questions, and the confusion and lack of knowledge permeates all levels. The teachers lack very basic knowledge in research procedures, conceptualization, generalization, phrasing questions, and presenting data, results, or conclusions, or even understanding the differences between them.

It seems that while teachers have moved away from being the main source of knowledge, giving way to substitutes (books, internet, experts, TV, etc.), the body of knowledge of how to do research, teach research skills, or even understand what we want to achieve through research has not been constructed.

One of our main claims is that the folk epistemologies of the field (pedagogical instructors as well as teachers) are the main influences on teachers' practices.

We are not expecting teachers to be experts in the philosophy of science, but is it possible to facilitate open-ended inquiry-based learning without asking yourself and your pupils the following questions?

1. What is the subject of inquiry? Are we looking on a whole or analyzing a whole to its segments? And what is the meaning of that? Are we looking on things and phenomena? Or do we look on our internal relationships? Interpersonal relationships? Symbols?

   [An example of an exercise that I do with my students is to send them to make an observation of another class. What are they looking at? Then, "imagine that you are a student of architecture – what are you looking at? Of fashion? Of anthropology? Psychology?" The definitions of what we are inquiring about change as we change our role.]

2. What is an appropriate process of acquiring knowledge? Is it a personal, intuitive process or, perhaps, a rational, systematic process? Do we need to do observations in order to gain new knowledge or to interpret what we see in order to arrive at a better

understanding? Maybe we cannot create new knowledge; all there is is already in books and all that's left for us to do is just to read. Of course, different purposes demand different processes.

3. By the same token, who or what is perceived as "knower"—as a reliable resource of knowledge?

4. How do we decide that something is true (intuition? systematic rational thinking? observations? or the scientific way: assumptions and experiments?).

5. What are the qualities of truth? Is there an absolute truth? Is it stable and eternal or does it tend to change? What are the connections between knowledge and, particularly, scientific knowledge and the truth?

Without understanding these questions, it is impossible for teachers or pedagogical instructors to teach or to choose programs, computerized or other, in an educated way, to decide what kinds of questions or skills we want the pupils to have, at what age and for what purpose.

In comparison to the first years of the modern education system, when research had a real purpose and the teachers were researchers (in different areas), research is now a kind of "showing off," something that is done for the sake of its own merit, an end instead of a means to an end. It appears to be perceived by people in the field as part of the post-modern society, which doesn't appreciate canonical knowledge, that everything goes with everything, that the skills to "know how" are many times more important than knowledge because they enable the flexibility that this era requires. Inquiry-based learning is about supplying the pupils with tools for life. But while mathematical tools have well-known standards and a well-established body of knowledge, inquiry and research – when it comes to elementary school – have not. One of the main roads to developing such standards is to begin dealing with the questions above.

Questions for discussion:

Several theoretical questions arise from these findings:

1. Is a "culture of inquiry " only possible in universities and research institutes?

2. What is the place of knowledge vs. skills and "know-how" in post-modern society?

3. Is there a canonical body of knowledge that is "a must"?

4. Who creates the knowledge (positivist vs. constructivist approach to knowledge)?

5. What is the place of non-disciplinary skills and knowledge (research) in a disciplinary system (conventional school organization)?

And some practical questions:

1. How can we bridge the rigid school structure and the open and irregular structure (in terms of time and space) of research if we want to use inquiry-based learning as a guiding principle?

2. Is there a need for ethical and professional standards for research work at different ages? What should the standards be for different age groups?

3. What do teachers need to know in order to facilitate inquiry-based learning?

4. Do they have to have research experience? If so, what kind? Does this knowledge – how to conduct research that conforms to standards – replace pedagogical knowledge and knowledge about a specific content area (such as history, math)?