

HEADLIGHT STORIES

Constructionist Teaching in a Computer Culture

**Angela Arai, Gwen Gibson, Nora Guzman,
Robert Holland, Gilda Keefe,
Marquita Minot, and Joanne Ronkin
Project Headlight
James W. Hennigan School**

Edited by Idit Harel and Yasmin Kafai

Introductions by Seymour Papert and Idit Harel

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A Note on the Production of Headlight Stories

These reports were first written and edited during 1990 and 1991 as part of a proposal to IBM to start the second phase of Project Headlight. They were then edited and compiled for publication in 1993.

Due to the high cost of colorprinting, we had to reproduce all of the color figures and photos in black and white. This reproduction does not render justice to the expressiveness of the children's designs and work. To give the reader a flavor of the children's original work and Project Headlight classroom atmosphere, we included a selection of pictures in the color plates.

Cover Design

Elizabeth Chimento, MIT Design Services

Production Assistance

Andrea Vercoe
Kalafya Brown

Publication Contact Address

Epistemology & Learning Group
The Media Laboratory
Massachusetts Institute of Technology
20 Ames Street E15-315
Cambridge, MA 02139

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On Learning from Headlight

Seymour Papert

1. What is this Book?

This collection of stories by teachers is an important contribution to the literature on {Fill in the blank}

A number of key words could be chosen for this multiple choice exercise (in which however many answers are the right answer).

I put "Logo" first, not only because the stories all involve Logo, but also because the Logo community will be especially pleased to see a body of writing which could be described by plugging in the phrases: "Teacher as Writer" or "Teacher as Researcher." To allow for the unlikely case that the school administrator (Robert Holland) among the authors will object to being labeled as "teacher," I propose "Innovative School Collaborative" to underscore the fact that in a functioning group of professionals in a school each individual made a unique personal contribution to a valuable intellectual product. Then, of course we could have "Constructionism" and "Technological Fluency" and "Growing a Computer Culture" and "Growing a Learning Culture" and many more.

2. Something the Project Isn't.

One answer I have come to dislike intensely is "School of the Future."

The stories collected here come from a project conducted at the Hennigan School in Boston in collaboration with the MIT Media Laboratory. I gave the project the name Headlight because I hoped that it would illuminate the future. But illuminating the future is very different from trying to make the future or simulate it or whatever. You don't look at a headlight to get a better view of where you are going, you look ahead at the road. In the same spirit when you read these stories try to read them in a spirit of where you think the ideas in them might go. The proverb that says "the best flattery is imitation" is just wrong; the best flattery is using someone's ideas to do your own thing.

As a matter of fact, I am not sure that it makes sense to try to build a "school of the future"—the future will outguess us all. Moreover I hope that the places where children (and teachers) spend their time in the future will be so unlike school as we know it that nobody will want to use the word "school" to describe them.

I plead guilty to having been careless in the past about using the phrase "School of the Future." I did once delude myself into thinking that we could build today a school that would be a model for the schools of the future. Today the only meaning I give to that phrase is a metaphor for a compass to give us direction as we move into the future. This metaphor is based on a view of the relationship between teachers and schools that I set out in *The Children's Machine*, which I shall now quickly recap and then use to put these Headlight Stories in a certain perspective.

3. Being a Teacher vs Being a Technician of the Test and the Curriculum.

I use the word School with a capital "S" to mean something different from actual schools with a lower case "s". I think of it as the "essence" of the institution of school that has grown up over the centuries (and in my view has become quite obsolete.) School implies a certain way of thinking about learning which I cannot explain quickly here. I shall have to confine myself to one simple point: the existence of a deep conflict between School and teachers. I don't just mean that teachers and the school system fight about contracts and working conditions. The conflict goes much deeper. Teachers are people who know from long personal experience (or maybe from native talent) how to foster the development of children and who love doing this. Every teacher is a different unique human being. And just as each human being loves in a personal and unique way, and thinks in a personal and unique way, and participates in family life in a personal and unique way, so too, I believe that every teacher would (and should) teach best in a unique and personal way. All this (and more) is the essence of being a teacher. And it is directly opposed to the role in which teacher is cast by School. While it makes a show of allowing a few crumbs of individuality, School tries to force standardized methods on every teacher: same curriculum, same textbooks ... and so on as we all know. In other words: School tries to cast the teacher in the role of a technician who will carry out the school's policy.

School does not ever fully succeed. What happens in each classroom is a compromise between the teacher's striving to make teaching a personal act of human relationship and School's striving to make it a technical act of standardized production.

I must warn against a misunderstanding: By technical I don't mean using technology ... Quite the contrary: *Headlight Stories* is about using technology to make teaching less technical. What I mean by technical is basing everything on techniques and have no time for empathy and relationship ... just as some sex manuals are about techniques and positions and have no room for the poetry of love.

Different people have different views about how they would like to push the compromise. Some would like to push it towards more standardization. Obviously I'd like to move it in the other direction. But I am no Utopian. I know that progress can be made only in small steps: what will lead to megachange is taking the small steps all in the same direction so that in time they add up. This is why we need a vision of the future, a *Headlight*, a compass. One of the methods used by the Education Establishment to resist change is to make changes every which way so that they cancel out like someone walking at random in the dark in a featureless desert without a map or a compass.

One more warning against misunderstanding: The conflict between School and teachers is not a conflict between the individual administrators and the teachers. Principals and even superintendents often struggle against the system as much as teachers do. They too make a compromise between their personal position and the role in which School (the system) tries to cast them.

4. Using Technology to Fight Technicity.

Here is my advice to teachers. Take stock of where you are in your compromise with the system. Look at all the directions in which you can take a small step and choose the one that makes the biggest little shift from technicity to personalization. Nobody can tell you what you ought to be doing.

I read the stories in this book as an anthology of very different steps taken by very different teachers. But each shows a choice of direction and every choice moves towards a less technical view of teaching. Angela Arai describes her work as using Logo to gain freedom for her and for her students to go beyond the lesson plan (read: stop being a technician) towards real learning. Joanne Ronkin talks about developing research activities through which students can find answers to their own questions. Gilda Keefe and Nora Guzman write about

how to connect children to other parts of the world; not the parts that happen to be in a curriculum but the places that are meaningful for the individual students.

This diversity shows the essence of what Project Headlight became. It is very much not a school of the future. It is a school of the present in which teachers of the present have appropriated the technology we call Logo and Computers in their own personal ways. And so they tell us something about how they will conduct their journey into the future.

5. How The Project Came About: Some Personal Roots.

My experience with the Headlight teachers and students came out of a series of discussions just about ten years ago between myself and Bob Nielsen, a truly visionary man who was then part of an IBM research team in Austin, Texas, whose charter included designing a model "school of the future." Nielsen had come to the conclusion that I could contribute to this design process and pursued the idea in the course of an extended conversation (in which Dorothy Derringer, who had been recruited by Nielsen to join the IBM Austin laboratory, became an active and creative participant) spread out over meetings in a number of interesting places.

Proposals for work on elementary education usually start with a statement of something wrong with schools as they are and go on to say how the deficiency could be remedied. The proposal (included as an appendix to this collection) that emerged from these discussions was very different. It started off by telling a story about how I used a computer in a very personal way to help me reconstruct a poem I had half forgotten. I did not use the story to argue that children would benefit from reconstructing poems the way I did. Quite the contrary. I wanted to give a sense of using a computer in a personal way that came from my own needs and inclinations. My sense of personal would be contradicted by any plan for others to replicate what I did in any literal way. Yes, I want to be "copied"—but only in the sense that copying me doing my own thing with the computer consists of increasing your awareness that you can do your own thing with it.

6. An Example of Being Personal: How a Headlight Story Broke My Writer's Block.

Re-reading my own old proposal shows me that I was beginning to grasp (in a way that I

have since come to understand much more clearly) the importance of being personal in thinking about education and education research. "Stop thinking so much about how children learn—as if children were another species from another planet. Think about how you learn." You know your own learning best because you know it from the inside. The more you become self-aware about learning the more you can empathize with others and develop sensitivity to the ways in which we are all the same—you, me, Einstein, Shakespeare and the kid in the resource room—and the ways we are all special and different from anyone else. (Maybe the way we are most the same is our need to do things our own different ways!)

When I was asked to write this preface I agreed enthusiastically partly because I have spent a long time looking for a voice in which to talk about the Headlight project. I thought maybe writing the preface would provide a natural context for doing so. In my recent book *The Children's Machine* I discuss incidents from Headlight but (to my chagrin) did not find a way to present the project as a whole. Now I was being offered a second chance. But easier said than done. When it came to actually writing I was (not surprisingly, in view of the fact that I had trouble last time) afflicted with an acute case of "writer's block." Words refused to come on the screen; or when they did they felt wooden and dull. In search of inspiration I read and re-read the stories I thought I was trying to introduce.

A breakthrough was triggered by looking at the paragraph in Gwen Gibson's contribution where she tells how a writing assignment for her fourth grade students was "like pulling teeth."

The children, all of them, could usually write one to three sentences—and that was all. I then stood in front of the class and told them: "you will go out to the computer and write a story for a first grade student." They used Bank-Street Writer.

I couldn't believe how well they wrote their stories on the computer! Suddenly, their stories became very long and interesting. On the paper they couldn't think. But with the computer right in front of them, they could see their writing, their errors and problems, and could correct them. I really believe that the computer made them think. They also seemed proud of what they were doing. Writing wasn't something they hated to do anymore (like when they had to write on paper).

Gwen Gibson's words offer several kinds of explanation of the change she saw in her students' writing. The idea that the computer is special because it allows the student to see and correct "errors and problems" is a kind of explanation which I classify as "cognitive." There is surely a lot of truth in it. But when I try to identify empathically with the children I am particularly struck by a kind of explanation which has more to do with feelings—one that is

more "affective" than "cognitive." Ms. Gibson hints at this kind of explanation by using words like "pulling teeth" and "something they hated" in referring to pre-computer methods of writing.

In order to pursue my sense of oneness with the students we have to look a little deeper at why they hated writing on paper. Certainly that won't do as an explanation of my writing block—I wasn't writing on paper; I was using a computer all along. To understand what I shared with the children's writing problems one must recognize that what they hated wasn't the paper as such: they hated what School's (traditional) kind of writing exercise had come to mean for them. You see one aspect of this very symbolic difference vividly if you turn on a TV program such as the CNN Headline news which presents an image of a modern workplace with computers on every desk. Here you see privileged people, successful people in the real world. They have computers and this fact gives meaning to the fact that others do not have them. The fact that there are no, or few, computers in schools means that School is an antiquated place, more of a chain to the past than a bridge to the future. If you are a student there, it means that society is giving you the cast-off clothes, treating you as a second rate person. But if you can grab a computer, you can feel, at least for a little while, the liberating excitement of touching the future—of holding a piece of the space age in your own hands.

7. Beware: Liberated Learning is Catchy!

To complete the loop I must add one more factor that contributed to Ms. Gibson's students' breaking their writing block (for that's what they did). This factor is social: call it contagion or infection. Each expression of excitement in the group contributes to all the others. So the sense of excitement grows by feeding on itself. When the students are using Logo rather than a simple word processor there are new components that make excitement as catchy as an epidemic. Someone makes a discovery. Others see on the screen that something new has happened. They crowd around, they ask, they share.

But the contagion is not confined to the students. Over and over in the stories the teacher talks about how she caught it from the students and found an energizing sense of new discovery. They talk less about something that I saw in visiting the project. The spread of excitement is a two way street: when students see teachers excited about learning something new they are energized in a way that seldom happens in the setting of a classroom where the teacher "covers" material she has known for years. The students rarely see the teacher learning. And in the Headlight culture students see teachers do more than learn: many of them get a chance to

see teachers actually struggling to write programs of their own! Good example of this in the present collection are Marquita Minot's and Joanne Ronkin's use of their own program as models to help students make theirs.

8. Who Durnit?

Of course you know one part of the answer: those kids broke my writing block by infecting me with their excitement. No question about that. But what is a more interesting and debatable idea is that they infected me with more than just abstract excitement. I think they drew me into their sense of liberation from the constraints of School and so renewed my own sense of excitement about real learning.

This then is the way I think it will go. Children, teachers, researchers—and others too, including parents—all have a role to play in a build-up of energy for change. Each group will energize and inspire the others.

9. And Who Can't Do It?

The picture I am painting is totally different from the standard trickle-down vision of change that goes like this:

Researchers will invent new ideas. They will be discussed and approved (or rejected) by big organizations such as State Boards or National Teachers' Associations. Then they will be published and adopted by School Systems. They will be passed down to the curriculum specialists in the schools. Teachers will be trained to use them. They will enter the classroom. The students who are last in line will have little choice.

I don't believe this can work. Go read these stories. You will come out of it with a better vision.