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ABSTRACT

A relationship exists between the three-year WARRANT project, created to design and implement a computer system to deliver a college freshman curriculum in the skills of reading, writing, and thinking, and the theory and practice of curriculum-building. The goal of the project is to create an interdisciplinary sequence of courses in critical skills that will function on an advanced work station that is capable of running up to 20 different processes at once. During the remaining two years of this project, it will be necessary to learn and then incorporate within the curriculum knowledge about the expert, the uninstructed student, and the instructed or developing student. Since it will be difficult to translate this knowledge, combined with three curriculum concepts (what a teacher teaches, what experts do, and what students do) into actual practice, the translation must be made by building up stories teachers tell, stories students tell, and stories put into the curriculum. (EL)

WARRANT: Developing a Curriculum for Critical Thinking

Cheryl Geisler

A revised version of a paper given at the Convention of the National Council of Teachers of English, November, 1985.

Introduction

The WARRANT Project is a three-year effort sponsored by the Fund for the Improvement of Post-Secondary Education to design and implement a computer system to deliver a college freshman curriculum in critical skills: reading, writing and thinking. We are now at the end of the first year of our project.

I work within a Program in Rhetoric housed in the Department of English at Carnegie-Mellon University. My colleagues on this project include David S. Kaufer and Christine Neuwirth, also of the English Department, and Preston Covey, a philosopher who works with the Center for the Development of Educational Computing, also at Carnegie-Mellon.

In this paper I want to talk about the relationship between the WARRANT project and the theory and practice of curriculum-building. This relationship arose because in order to put a critical skills curriculum on the computer, we have had to build that curriculum. There was no such curriculum ready-made that satisfied us. In this process, theoretical issues have arisen which I want to focus on today.

The Goals of the WARRANT Project

To start with, let me tell you something about the goals of the WARRANT project. It is both a curriculum project and a computer project.

As a curriculum project, we are committed to developing a curriculum for critical reading, writing, and thinking. I use the word "curriculum" here to refer to a set of goals and methods along with a time frame for teaching. We want to specify the what, how, and when of a course or sequence of courses in critical skills.

By critical skills, we are referring to what some others have called the high level skills of literacy: the ability to take information from reading, think about it in new ways, and communicate that new structure of thought to an audience. We take an interdisciplinary approach to critical thinking, drawing on the insights that come to us from philosophy, rhetoric, cognitive psychology, and education.

We are also a computer project. We are committed to delivering this new critical skills curriculum on an advanced workstation that functions both as a stand-alone personal

computer and as a link-up with other such workstations on campus at Carnegie-Mellon. I'm not going to talk much about the technical aspects of the computer project today, but I do want to say a couple of things to make it clear how being a computer project has an impact on our curricular thinking.

To begin with, we *can* imagine our curriculum as having a life outside of the classroom as well as inside of it. We imagine instruction and encouragement to be available not only when the student is interacting with a teacher in a classroom, but also when the student is working on assignments in a dorm room. Of course, computers have been long known as delivery systems for instruction that are somewhat independent of the teacher, but I am talking about more than that.

Conceptually, we can divide a student's activities in a course into those that s/he carries out in interaction with the teacher, and those which s/he carries out on her own. Usually the emphasis in a classroom is on knowledge; the emphasis outside of the classroom is on applying that knowledge to develop skill. We think of the critical skills of reading, writing, and thinking as being a matter of action as well as knowledge, and we believe that the availability of the computer will allow curricular effects to be directly felt not only while the student is trying to *know* but also when the student is trying to *do*.

Let me be more concrete. With the advanced personal workstation, we can actually think of students working -- reading, thinking, and writing -- within the context of the computer system. Two features of the computer we are designing for allow us to consider this. One, it has a large, high-resolution screen roughly the size of two 8 1/2 by 11 sheets of paper placed side by side. Coupled with this, we have the high resolution of a MacIntosh screen. A screen this size, with this kind of clarity overcomes some of the feeling of being cramped and blurry that a standard CRT now gives.

Secondly, the advanced worstation has the ability to run up to twenty different processes at once. This means you can be doing more than one thing at a time on the screen, reading in one corner, taking notes in another, sending computer mail in another and so on. You can move text from one process to another, from your notes to you text, from your mail to your notes, and so on, with simple commands. Furthermore, you can temporarily hide some of your processes when you don't want to see them, and uncover them again when you need them.

To give you a sense of how this might look to a user, I have brought along a snapshot of an actual screen for one part of our system, notecarding.

Insert Diagram 1, the Notecarding System

The notecarding ability that I just displayed is an example of a tool, a process that allows students to *do*. In addition to tools, WARRANT will provide instructional support for the *doing* at four levels.

At the top level, we have a curriculum, that is, a set of goals with a breakdown of activities along the time line of a semester. At the next level, we have what we call advice. Advice are sets of strategies or heuristics for ways to achieve specific goals. Next, we have models of how to carry out that advice. And finally, we have a level where we can comment on the models.

To better imagine what I'm talking about, let's take a concrete instantiation of the instructional component. This is a mock-up, something we've done to help us in our thinking, but not yet part of the system, but it will give you an idea of where we're going.

Insert Diagram 2, Beth's Good Model

So that's, in both abstract and concrete form, what we're aiming at curricularly. Now I'd like to talk more theoretically about what we must know to build this curriculum, how we have gone about gathering this information, and some of the curricular issues that have crystalized as we have tried to use this information.

What We must Know to Build This Curriculum

To build the WARRANT curriculum, we are developing instruction at the four levels I mentioned before: goals, advice, models, and comment. This is the package of instructional support that we are betting will help students to *do*, to use and develop critical skills. What kinds of knowledge must such a curriculum contain?

First, it must embody what people in artificial intelligence have taken to calling "a model of the expert". This means that the curriculum must be informed with a clear sense of what, in the best of all possible worlds, students should be able to do once they've gone through it. Maybe they won't be experts, but they will be more expert-like. Thus, to build this curriculum, we must know what experts do.

Second, a curriculum must embody a model of the uninstructed student. This means that the curriculum must be informed by a sense of what students know, believe, think before they receive instruction. Instruction must be more than just telling students to act like experts. It must adapt this information to students' current beliefs and skills. Thus, to build this curriculum, we must also know what students do left to their own devices.

Lastly, a curriculum must embody a model of the instructed or developing student. This means that the curriculum must be informed by a sense of how the uninstructed student changes under the impact of instruction. After receiving instruction, students don't achieve our goals immediately; they go through stages, one concept allowing another concept, one skill developing into another, more complex skill. Thus we must know how students change over the course of a semester with instruction.

Our Data-Gathering Plans

To gather these three types of information -- knowledge about experts, knowledge about uninstructed students, and knowledge about instructed students, we have been engaged in an empirical data-gathering effort with three foci.

Insert Diagram 3, The Empirical Effort

At each of these foci, we have sought information about how people complete what we have chosen as the central task for our curriculum. This task comes from ethical philosophy; we are asking people to read articles on the issue of paternalism -- is it right to interfer in the life of someone else for their own good? -- and write a paper to an uninitiated audience to define this issue and suggest under what conditions this interference is justified.

For experts, we have observed experienced philosophers completing this task. For uninstructed students, we have observed freshmen completing this task as a semester-long job without instruction. For instructed students, we have followed a teacher and his students working through the issues in a traditional classroom. I won't go into the details of the methodology we've used, but what we're coming up with is a fairly detailed picture of the process each of these groups go through.

Issues in Translating this Knowledge into Curriculum

From the point of view of what knowledge we required for our curriculum, the reasons we sought out these three sources of information were clear: experienced philosophers mark the theoretical endpoint; uninstructed students mark the theoretical beginning point, and instructed students in a course map the journey in-between. From this perspective, these three sources of information should yield compatible links in a chain.

They don't.

And, actually, we didn't expect them to.

We did have the compatible-links-in-a-chain theory in mind when we designed our data gathering effort. But we also knew that our design was incorporating three competing and sometimes incompatible conceptions of curriculum:

- Curriculum is what a teacher teaches.
- Curriculum is what experts do.
- Curriculum is what students do.

The first conception of a curriculum that we embedded in this empirical design is that a curriculum is a conception that resides in the mind of a teacher. It is the understandings that allow one to teach a course, to say that one knows how to teach a course. One of us volunteered to become that teacher by working out the details of a critical skills course through successive iterations in a classroom. We believed that it was important to have this conception of the curriculum in our design because we were aware of how many slips there can be between the theory of what should happen in a semester and what actually does happen.

The second conception of a curriculum we embedded in this empirical design is that a curriculum should be based on solid research about what "real" people "really" do when they are "really" working. In the field of writing research a lot of productive work has been done in the last fifteen years trying to untangle the "truth" about how people write from the myths we have told about how they should write. We have discovered, for example, that no one uses the linear model of composing that so many textbooks were forcing students into: choose a topic, narrow to a thesis, do some research, write an outline, expand the outline

into a paper, revise for mechanics, and turn it in. Instead, "real" people were a lot messier, changing their minds about the thesis, abandoning or redoing outlines, sometimes throwing out entire drafts when a new insight hits. We considered that it was important to ground our curriculum in the experience of real experts because we knew of how many competing ideas there were about what critical skills were. We wanted to know more about what critical skills were.

The third conception of curriculum we embedded in this empirical design is that a curriculum should nurture the positive beliefs and strategies that our students come to us with. The idea here is that if we listen carefully to what are students are doing and thinking, remove the roadblocks, they will become better writers and thinkers naturally. We need to put them into situations where they are writing about something meaningful to an audience they care about and see what words they find, what strategies occur to them. We felt it was important to include this conception of curriculum in our design because we didn't want to teach students what they already knew or forget to teach them something we took for granted

What we had done -- and what we knew we were doing -- was putting these conceptions side-by-side to see how they would interact; we were betting that some kind of chain, some kind of coherence would emerge. That these three conceptions of curriculum do not have to be compatible links in a chain has become obvious as we've begun to look more closely at our data. Let's take the example of building the plan in the mock-up I showed you earlier.

Here we have a plan to define the problem. This plan looks like a chain of goals that the students should have, and that is certainly what we expect and hope the student to think. But where did we get this plan come from?

- It is not what students do naturally, without instruction. Our students never come so close.
- Neither is it what experts did. They never work so systematically.
- Nor is it what our teacher did with his class. This part of the semester really didn't work out.

The data, then, don't speak directly to the task of building curriculum. They don't link together in a coherent chain. Where does the curriculum come from then? It's still to

early to give a complete answer, but one thing is clear. The curriculum comes from us, the curriculum developers, engaged in much the same kinds of activities that teachers use when they teach. A story might help you to understand what I mean.

Last week, I was reading over the transcripts of the thinking-aloud protocols we have from our teacher planning his classes during the first three weeks of the semester. He had asked his students to read a series of examples and non-example of paternalism and come up with a definition, and he was trying to understand what they needed to be taught. He began with an elaborate model of what a definition of paternalism should include and intended to read through each definition and grade it according to how well it covered these important aspects.

This strategy lasted about two papers. Instead of fitting students papers into pre-defined categories, he found himself reacting to the ways that students seemed to go wrong. In this set of papers, they tended to be either inaccurate or not well enough grounded in in the specific examples.

The next day in class, he had constructed a simple story of the students behavior that accounted for these two characteristics. He told them that their definitions looked like they were the products of first readings of the material and that what they needed to do was go back for a second, more analytic reading. This notion of first and second readings developed into one of the central concepts of the class.

We interviewed two students after this class. We found that each of them had read the material three or more times before writing their definitions and that each of them had revised these definitions. In other words, their work was hardly the product of a first reading. Yet, when asked, each of them reported that they had revised their notion of what the assignment had really called for based on this contrast between first and second readings.

In many ways, as developers of WARRANT, we are like that teacher. First, we began with certain assumptions about what constitute critical skills. We were just like the teacher coming to those student papers with an elaborate system for grading them.

Next, we looked at what our uninstructed students did and what our experts did, and we dug out all our buried knowledge and skill in our reactions. We say, "Ah, you see, he did

thus-and-such and that was good." Or we say, "She did thus and so, and that took her right off track." Just as the teacher restructured his plan for evaluating based on his intuitive reactions to what the students had written, we are restructuring our notions of what critical skills are based on what the students and experts did.

Lastly, we construct stories to explain how one ought to go about the task. The story in the plan box you saw on the overhead is a story about how a student defines a problem by trying to find personally meaningful examples of it and examining the important features of that example. This story is of the same stuff as the teacher's story about first and second readings.

What we are left with here is something of an enigma. Based on our observations of the classroom, we know that what a teacher and his students build in the classroom are fairly simple stories of how to go about certain activities. Yet, based on our studies of both experts and novices and our interviews with students, we know that what students really do is quite complex. This mismatch in complexity, however, does not seem to invalidate the instruction, nor make it -- and we sometimes fear -- besides the point.

Instead, students seem to engage in a process of story making in which they try to take on the roles of the protagonists in our stories. In our example, they become, in retrospect, that first-pass reader even though they actually read more than once. What I think must happen is that having taken on this role, they try to find the commonalities between their actual past and this fictionalized past and create for themselves a new, modified story or plan to use in the future.

Let me step back a bit and summarize. First, what people actually do with a skill and how we talk about skills in a classroom are necessarily disjoint. In practice, in critical reading, writing and thinking, we respond to the unexpected, get interrupted by phone calls, have unanticipated problems, and otherwise proceed on a very messy path. In a classroom, however, we build social constructs meant to communicate important points to a large number of people. This means that there will be no direct translation of the results of our empirical studies into the curriculum we build. We will have to do the translating through building up what I've been here calling stories.

In the best of circumstances, students seem to be able to find some connection between these simplistic stories and their actual behavior. In the worst of circumstances, they see

no connection. What we don't understand yet is how these stories function. As we continue to examine our data, as we continue to speculate on the relationships between basic research into skills and curriculum building, I think we should be taking a closer look at them: the stories we as teachers tell; the stories our students tell themselves; and the stories, in the case of the WARRANT project, we put into our curriculum. This is, as far as I know, a neglected aspect of curriculum theorizing.

WARRANT — NoteCard & ReadText — wylie

Bernard Gert & Charles Culver, "Paternalistic Behavior,"

[Extracted from *Philosophy and Public Affairs* 6 (1976), 45-57.]

Discussions of paternalism are often marred by the failure to consider the wide variety of paternalistic acts. Thus Gerald Dworkin in his article "Paternalism" says: "By paternalism I shall understand roughly the interference with a person's liberty of action justified by reasons referring exclusively to the welfare, good, happiness, needs, interests, values of the person being coerced."[1] All Dworkin's examples are of laws he considers paternalistic. Though h
ere is such a thing as "parental
assumes that it will always invo
"to restrict the child's free
Paternalism in law doubtless
with liberty most of the ti
nature of law, not to the nat
of the above quotations a
incorrectly regards interfering
action as entailing that the p
following example shows th
paternalism must allow not o
which no person is bei
paternalistic action which d
with anyone's liberty of actio

Font
Justify
Title
Region
Cut
Copy
Plainer
Bold
Italic
Underline
Take Note

Mr. N, a member of a re... believe in blood transfusions, is involved in a serious automobile accident and loses a large amount of blood. On arriving at the hospital, he is still conscious and informs the doctor of his views on blood transfusion. Immediately thereafter he faints from loss of blood. The doctor believes that if Mr. N is not given a transfusion he will die. Thereupon, while Mr. N is still unconscious, the doctor arranges for a carries out the blood transfusion. (Similar cases may easily be constructed using antibiotic drugs or vaccines)

This example shows not only that paternalistic action need not be coercive and need not involve an attempt to interfere with the liberty of action of a person, but also that it need not even involve an attempt to control the behavior of a person. We regard coercive action, which involves the use of threats, as a subclass of attempts to interfere with liberty of action. Attempts at such interference are, in turn, a subclass of attempts to control behavior. Thus, by showing that we can have paternalistic action which does not even involve an attempt to control behavior, we can show that paternalistic action need not be coercive nor involve an attempt to interfere with liberty of action. In the blood transfusion case there was no attempt to control behavior, indeed there was no behavior to control; thus it seems clear that there was no attempt to interfere with liberty

Note Card Listings by Name

bad consequences
Consent & competence
Critique- immorality
Definition #2
Examples of pat.
Expansion of paternalism
Gert-Culver Critique
Introduction--idea
J.S. Mill on Liberty
Justification
knowledge of morality justifies action
Make Definition Broader
Moral question
moral rules
morality
no Consent
Pat. affects feelings
Pat. uses own values
Qualification of pat.
types of behavior control

J.S. Mill on Liberty

Purpose for which power sould be used over others in society against his will, is to prevent harm to other in the community.

Consent & competence

actions to help permanently incompetent people are justified.

example: retardation mental illness.

people who are unable to understand or practice satisfactorily the basic requirements of survival. Those whose lives would be horrible if others did not intervene to help. These people are likely to never reassess situations and give consent.

no Consent

Say pat. also depriving of opportunity

example husband removing pills from house so wife doesn't not take them.

Of course is Pat. because the action of husband affected the future action of wife.

Doesn't matter in what way. Opport. is on of 100's of ways it can be done.

Diagram 1: The Notecarding system.

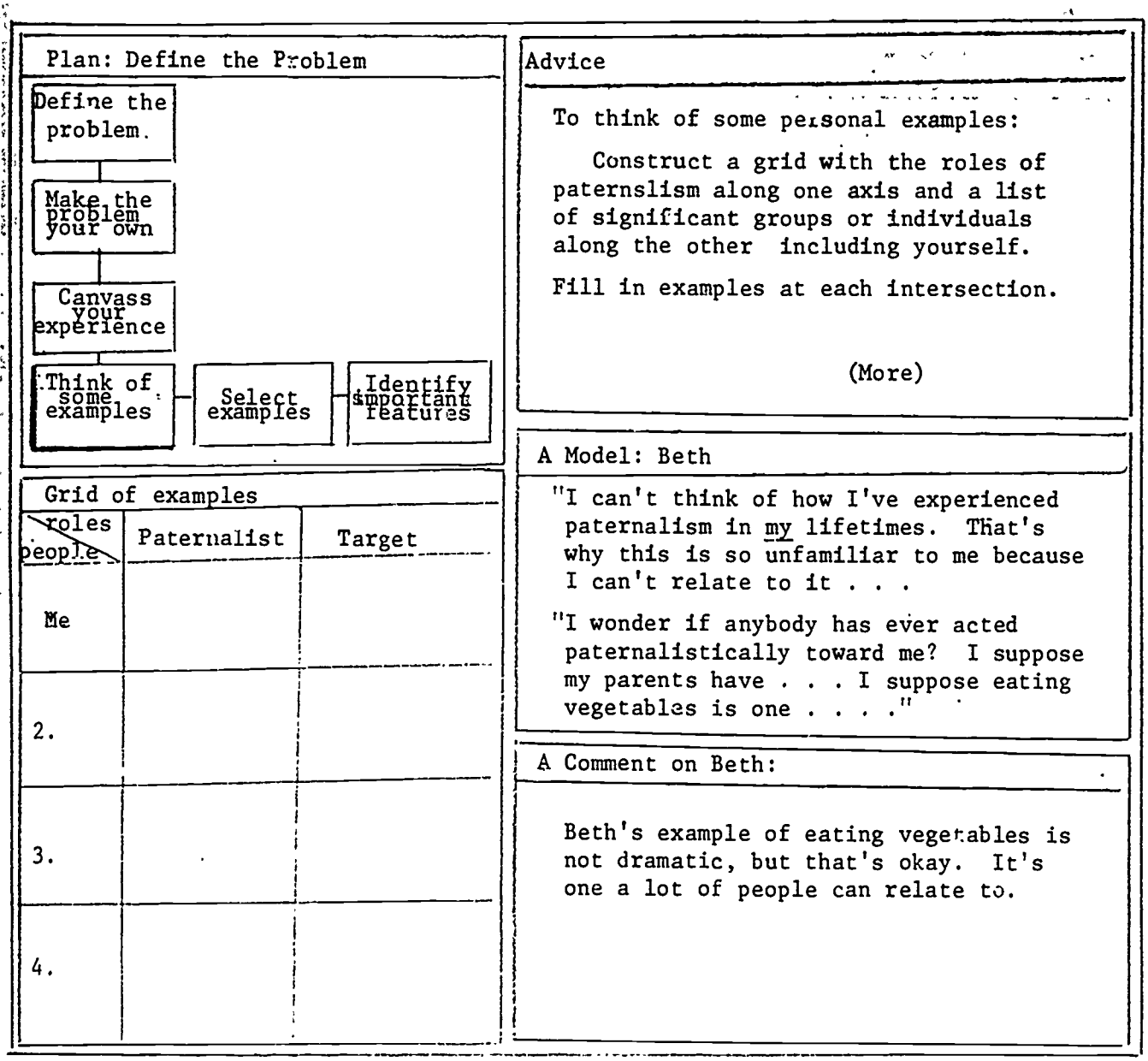

Diagram 2: Beth's good model.

Diagram 3: The empirical effort.