

## Remarks on the Struggle for Citizenship and Math/Science Literacy

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What is needed in school mathematics? The context that's most important for me in considering this question is that there's an enormous social problem to be addressed. In the background of this problem is history: a history of the struggle for freedom, which requires literacy. Theresa Perry points out that there's also a history of using literacy as a tool for freedom (Perry & Fraser 1993).

This history is part of the answer to the question "what will motivate students and their parents to get involved in learning math and science?" People some- times ask "Why should studen.ts want to do the math? What is the hook which will get the community aroused over this issue?" One of the central things we're saying is that the ongoing

struggle for citizen- ship and equality for minority. people is now linked to an issue of math and science literacy. This idea is the background of everything we do in the Algebra Project. This idea determines strategies and choices made about organization, dissemination, and the content of the curriculum. It never goes away. It's impor- tant to make it clear that even the development of some sterling . new curriculum-a real breakthrough-would not make us happy if it did not deeply and seriously address the issue of access to literacy for everyone. That is what is

driving the project. One of the implications of this position has been that we have not spent a major portion of our time developing a full curriculum for any grade level. What we did was take what we thought was a minimum intervention and try to maxi- mize its effects. In that process we began to define what we're calling a "floor"- ~n acceptable goal or standard for the mathematical component of math-science literacy at the middle school level. The "floor" is this: you have all the middle school students ready to do the college prep math sequence when they get to high school. . There are

two things to clarify about this floor. First, it's the floor, not the ceiling. We're not trying to put constraints or limits on what any group of children might learn. Second, in many ways the college prep math curriculum is a moving target. It differs from place to place, and it's changing. So for each school, there's a local target. My metaphor is that you're running to get on board.

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the bus. The bus is moving, and you can't get on it from a standstill position. As), your speed begins to approach the speed of the bus, you have a chance of]

hopping on. . . .

In terms of curriculum, this means that for each middle school student there a standard curriculum out there, which is the college prep sequence in high school. What you want for an Algebra Project student is this: whatever is out there, they engage it. In their school system, whatever is in place as the standard college prep curriculum, you want them to engage that. It's important, however, that whatever else is coming in to supplement or replace that curriculum has to be a bona fide college preparation. It can't be something that is put in place to continue a tradition of separate tracks for some students. It's not clear that the expression "standard college prep math curriculum" means something coherent in terms of mathematical content. However, it certainly does mean something in terms of what colleges are going to accept as admissions requirements. It's got to mean, at a minimum, that when you finish it you arrive at college ready to do college mathematics: That's another floor that we have to be concerned about, although our work is largely with middle schools.

Our aim is to change the situation that currently exists, where large percentages of minority students

who get through a high school and get admitted to a college, have to take remedial math in order to get to the place where they can even get college credit for mathematics courses. Recently I heard from a woman who teaches mathematics at the University of Arkansas at Monticello. She told me that about 80% of freshman must take remedial math, for which they cannot get college credit. Another person, head of a center for academic advising for minority students at University of Kentucky at Louisville, told me that close to 90% of entering minority students had to take remedial algebra during their freshman year, for which they did not get credit. A faculty member at Rutgers in experimental physics recently lamented the absence of minority students in his classes. He said "they're all across campus in the remedial sections."

Part of the literacy standard, then, the floor for all students, must be this: in middle school, when you leave, you are ready to engage with the college preparatory sequence in high school. It's a moving target, but however it's defined, it must then be seen as another floor: you must be ready, to engage college curricula in math and science, for full college credit.

This overall picture requires that we think longitudinally, and that we track what happens after students leave our immediate domain of interest or expertise. This kind of longitudinal thinking is difficult to do, because it requires coordinating actions and decisions among a wide variety of institutions and people.

Consider the role of mathematicians here. There is nothing in the training of mathematicians that prepares them to lead in such a literacy effort. Yet the literacy effort really cannot succeed unless it enlists the active participation of some critical mass of the mathematical community. The question of how we all

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learn to work across several arenas is unsolved. Those arenas are large and complicated. They include the curriculum itself, instructional philosophy, schools, school systems, and individual classrooms. Communities and their processes of social change must also be centrally involved, and in some broad sense, national and local politics. Really working in all these arenas will require that many people adopt a more holistic outlook than they have ever done before.

The civil rights movement is the experience that guides my thinking here. In the theater that I was in, Mississippi, the issue was citizenship. Within the citizenship issue was embedded the literacy issue. This was symbolized and instantiated by the fact that the state required prospective voters to make some interpretation of the Constitution. Underneath this practice was a question: should we give the vote to illiterate people? Thus another question was raised: what is the literacy that is needed to exercise the right to vote?

What we came to see was that we had to launch a campaign which was broad enough to reach through to where the power was, the power that was expressed through political participation in the state. At that time in Mississippi, this turned out to be the National Democratic Party. On the one hand we had to think in terms of a broad enough agenda—you weren't just thinking about how you were going to get these particular people down here to the polls to register. Nor were you just thinking about how you were going to build a succession of successful challenges, to get the Justice Department to act through the courts. Nor were you, just thinking about how you were going to build a constituency to get legislation through Congress. But on the other hand, in addition to all of those, we had to think about the issue of the actual political party in the state—the party that already existed and represented life in the state as it had gone on for many years. We had to deal with the particularities of the time and place.

What one had to do in that time was to develop a strategy that operated at all of these different levels simultaneously. Embedded within this global approach was the literacy question. We had to address this by producing a new generation of leadership from

among the Mississippi Black sharecroppers, day laborers, domestic workers, and farmers, because ultimately they had to make their own case. They were the ones who had to go to register. They were the ones who had to challenge the existing political party and say "we are here with power, we are able to articulate our positions, we are here in such a way that you cannot look us in the face and tell us that we cannot represent ourselves in this process."

· What turned out to be critical in the process of establishing this kind of political literacy was something which we have found is also critical in establishing math literacy. That is the understanding of and use of meetings as tools for empowering the participants. But to accomplish our goals then, the meetings had to shift from being places where there was a person or panel of people presiding, delivering information which the rest of the participants listened to, and accepted. The meetings gradually shifted to places where people actively engaged the problems that were embedded in these political arenas, and figured out

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It was our learning how to use meetings like this that led to the political literacy of a network of people—it was their training ground that allowed them to emerge as political leaders of their state. These were not

credentialed people, they were not high school graduates. They were not members of labor unions, or national church associations. Yet through the process, they became leaders.

Mathematics literacy involves problems on a similar scale. There are issues that move at the level of government institutions and their policies. There are issues that move at the level of legislation. There are issues that move at the level of the community and parents and school systems. And in addition to all of that there are the students in the classrooms and their teachers.

In my view, many people will see our vision as impossible. There's a sense in which most people are not going to believe or accept any of this agenda until they are confronted with the products of such an effort: students who come out of schools and classrooms armed with a new understanding of the mathematics and with a new understanding of themselves 'as leaders, participants and learners.

resources, really has depended on an understanding of exactly this principle. We are continually trying to develop within the project an organizational framework that encourages the emergence of leadership at the site level, the community

level, the local level. The next thing is to develop a networking capacity which encourages the leadership at different sites to network with each other across sites. This is a bottom-up approach to the development of a national infrastructure. However, while the technology is now available to make a more decentralized, bottom-up structure possible, the human issues about organizational power and decision-making have not changed. The first set of problems on the table are these: is there an agreement about a set of values of such a network that will inform member-

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## REFERENCES

Perry, Theresa & James W. Fraser (1993). *Freedom's Plough: Teaching in the Multicultural Class-*

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approaches to solutions, and ways to organize

themselves to effect those solutions.

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resources, really has depended on an understanding of exactly this principle. We are continually trying to develop within the project an organizational framework that encourages the emergence of leadership at the site level, the community

How do classrooms get transformed into places where students can develop in these ways? Part of the understanding of the movement is an understanding of change. Part of what happened in Mississippi was the creation of a culture of change—a change in the climate of the consciousness of Black people in that state. Part of what was involved was tapping into a consensus. The vote provided a consensus. Everyone agreed that if they could get the vote, it would be a good thing,

and they would be better off. So we could rally people across a wide spectrum to work together. I think the same window of opportunity is available around the issue of mathematics literacy. I think everyone agrees that if it is possible to open the door to real mathematical understanding, it would be a good thing,

and we would all be better off. It's the establishing of this climate and change of consciousness about the mathematics in the larger community that will go a long way toward making it possible to change the classrooms. It's a process where you push and you pull, because if you can be successful in the classrooms, that also gives you an opening to approach the community. In order to get into the classrooms to all the students, we need the community's political involvement and clout. You have to work both sides of the street at the same

time. What this comes down to is the philosophy of

Ella Baker: leadership at the grassroots level. The campaign in Mississippi was mounted with virtually no money. It required a consciousness that leadership to run the effort would emerge from the communities who were working, and it required trying to develop an organizational structure which would encourage

the emergence of such leadership. So how is the

Algebra Project trying to do this in terms of the literacy problem today? The rapid growth of the Algebra Project, which has had limited financial

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