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Agency, Collaboration, and Learning in a Middle-School Program  
for Science and Literacy

Courtney B. Cazden  
Harvard Graduate School of Education (USA)

I have many people to thank for the opportunity to be here: the Arrente people who are our historic and still continuing hosts here in Alice Springs; the conference organizers, and the teacher Martha Rutherford of the United States program I will present.

The program, called “Fostering a Community of Learners” (FCL), was developed as a science and literacy program during the early 1990s by psychologists Ann Brown and Joseph Campione. It existed (with external funding) in an inner-city public school in Oakland, California until Brown’s death, and became one of the most visible school reform programs in the U.S.—well documented for the quantitative achievements of its students over successive years on both standardized literacy tests and criterion-referenced tests in both literacy and science developed within the program, and also discussed in the writings of numerous academic visitors (including Cazden, 2001).

For example, FCL is the one program discussed in detail by US senior psychologist of education, Jerome Bruner in his book, The Culture of Education. Sharply critical of the US preoccupation with test performance and standards at the expense of attention to what he calls a “more intimate perspective” of what we have learned about how teachers teach and how students learn, Bruner speaks of Brown as “perhaps the leading figure in this advance” (1996, p86).

I have also selected FCL to present here, but for a different reason. There is now a small set of new evidence on its long-term impact on its students even though each experienced the program for only one year. The evidence comes from interviews conducted during 2004 by Martha Rutherford, the classroom teacher who collaborated with Brown and Campione in FCL program development ( a prime example of the kind of professional “distributed cognition” between two experts, academic researcher and teacher, that is probably always essential). Rutherford interviewed as many of her former students—now in their twenties--as she could locate in the Northern California area. She spoke with them, as a group and individually, about memories of their FCL experience, and about its impact on their lives during the intervening more than 10 years<sup>i</sup>. The results are significant for the developmental focus of several of our conference themes.

FCL students were overwhelmingly children of color. One article about the program gives statistics for “one representative sixth-grade class”: 60% African American, 15% Asian, 12% Caucasian, 6% Pacific Islanders, 7% other; with almost half of their families receiving free or reduced-cost lunch (Brown et al, 1993, p195). The five students who participated in the 2004 interviews are from these groups, three young women and two young men:

*Adaoha*: African American, she is now an assistant nurse, attending night school to complete her RN certification.

*Florencia*: Samoan, she has just finished a pre-med college course and hopes to go on to medical school.

*Hanadora*: African American, she is working while raising two children as a single mom, and plans to go back to school to get a nursing credential as soon as she can.

*Jonathan*: African American, he is working in journalism and as a teaching coach while he finishes his BA and gets his teaching credential.

*Nwaoha*: African American, he has just finished an engineering degree.

To understand quotes from their interviews, you need to have in mind the FCL curriculum and how the pedagogy was organized. The big curriculum idea was biological interdependence. Students researched first the case of DDT effects in Borneo, and then a longer multi-month unit on endangered species. Students were organized into research teams; each team negotiated a decision about which animal the team would study from a list of possibilities--panda, alligator etc.; individual team members then negotiated their selection of a specialized feature within each animal subgroup (adaptation, reproduction, etc.).

Each team had the responsibility for a final team report on their research and for contributing questions for inclusion on a final class test. They also had responsibility for teaching the rest of the class what they had learned so that everyone could pass that test on what the class, collectively, had learned. To engage in this work, the students gradually became socialized into the patterns of participation expected in a set of regularly recurring activity structures: Benchmarks, Research Rotations, Jigsaw groups, and Cross-talk groups:

**Benchmarks:** These were whole-class lecture-discussions led by Rutherford or her science co-teacher, Doris Ash—first, to draw out students’ initial ideas and later to “seed” more sophisticated understandings, for example, the function of a food chain in explaining the effects of an animal becoming endangered.

- **Research rotations** through several activities: (a) individual research, reading, note-taking etc.(b) working at the computer to find new resources, e-mailing each other and outsiders (like biology graduate students co-opted to give “expert” help), or working on their team’s report and conferencing about it with the

teacher; (c) participating, initially under the teacher's guidance, in **Reciprocal Teaching** (RT) comprehension discussions of texts—from books, the Internet, or sections of their student reports.<sup>ii</sup>

- **Jigsaw groups:** Periodically, as research teams became more knowledgeable about their subtopics, a student from each team met in an ad hoc group with a member of each of the other teams and taught them—typically for as much as 30 minutes—the results of their research-in progress, sometimes by “RTing” (as the students called it) a relevant text or a section of the team's own report.
- **Cross-talk:** When the students themselves realized that Jigsaw teaching required them to know all about their team's animal, not just their individual sub-topic on adaptation, reproduction etc, they initiated an intra-team version of Jigsaw that they named “Cross-talk.”

These FCL activity structures are important not for themselves, but for the design features they enact. Brown herself, in her presidential address to the American Educational Research Association, listed 7 such “learning principles”.<sup>iii</sup> For the sake of brevity, I'll substitute here the four “crucial ideas” that Bruner singled out after visiting FCL at a time when the students were designing a program to save the animals endangered by the catastrophic oil spill from the Exxon Valdez tanker off the southern coast of Alaska.

- **Agency:** “taking control of your own mental activity.”
- **Reflection:** “not simply ‘learning in the raw,’ but making what you learn make sense, understanding it.”

- **Collaboration:** “sharing the resources of the mix of human beings involved in teaching and learning.”
- **Culture:** “the way of life and thought that we construct, negotiate, institutionalize...(1996, 86-7).

I will organize quotes from the student interviews under the first three of these headings, then call attention to two more crucial ideas that the teacher added after she considered Bruner’s list, and end with additional quotes about how these five young people thought about the long-term (longitudinal) impact of their experience in this classroom culture.

### Agency

Florencia speaks to what entering FCL meant to her after years in a more typical inner-city school:

*I came from a school that was in threat of being closed down due to increased violence, and a curriculum that was practically deadening and very non-effective to say the least....*

*When I take my mind back to the first day that I SAT in that classroom and saw the excitement.... I couldn’t help but feel excited myself; it was as if a spark of intellectual hope and potential had been ignited. I don’t know whether that was intended but it was truly felt.... Sitting there hearing what we were about to do was like, at least for me, a starved child being shown a meal fit for a King. My mind was the hungry child and I could feel myself grown eager in the hopes that I could be filling my mind to its fullest potential. It was almost like a MIND homecoming of sorts. It was something we had ALWAYS been able to do but never actually had the chance, and now, the possibilities were seemingly endless.*

*I never had that opportunity before.... Most teachers I had already interacted with didn’t care about me or what I had to say let alone THINK.... They only cared if you listened—even if they were talking about nothing. The [FCL] project made me feel like the opportunities were limitless....*

*We were given a free hand to read, write, learn, teach and most of all—grow.*

Actively feeling a “spark of intellectual hope and potential,” a “mind homecoming,”

where teachers cared about what she thought and where “opportunities were limitless”—

in contrast to classrooms where teachers only cared if students “listened, even if they were talking about nothing”--these are signs of a dramatic shift in Florencia’s sense of agency.

In Nwaoha’s words, agency is in the availability of choices about what to research:

*You guys submitted a broad list, broad categories of different options that we could do, and we as groups had to determine amongst ourselves which one, we had to come to a consensus.... [After that] we had to figure out what we were going to do individually and that kind of personalized it more because you were actually deciding what you were going to be responsible for and then actually taking responsibility for doing your part and being part of a team to do all the parts. I knew I had to get all the information on the adaptations or what not. This made our topics really important.... When you are the one who decides on what you want to do nine times out of ten you are going to put more effort into it—if you have an option to choose.*

Jonathan’s sense of agency is expressed in choices not of topics, but of the approach or stance one could take to a topic:

*By freedom—yes, we had our assignments, and roles, and some of the stuff that was supposed to be addressed in the paper was mandatory. But you could take different angles.... There wasn’t a right answer, and it was one of the first times in school where there wasn’t, like, “Here is the question and it is one right answer.” There were plenty of right answers. So you had the freedom to approach the topic or approach the question however you wanted as long as you came away making some kind of sense or some kind of logic and reason.*

### Collaboration

When Rutherford began the group interview with the open-ended question, “What do you remember about the FCL project, Hanadora’s answer was echoed by others, “*I remember working with a group. It was my first time working with a group on a project.*”

Later in that session and in the individual interviews, other students said more about the impact of collaboration on their individual learning. As the students remembered it, collaboration wasn’t confined to the specific activity structures designed with that feature

in mind (Reciprocal Teaching, Jigsaw and Cross-Talk groups); it pervaded all their work:

*Nwaoha: I learned how to work with others to actually put a good quality product together, as a team effort. You know we also helped each other, like when we couldn't find information on something we asked someone else if they knew where to find information. So that was important....That was what the structure of the class did...it made us all involved. [That meant] like, we all worked together, first of all....We had to as a group, you know, come up with specific animals that we would research—like as a group we picked endangerment of the primates.*

Jonathan, in describing his sense of “freedom,” referred to the teacher’s trust in the students that made possible the freedom of physical movement that in turn enabled collaboration during non-official-group times of the day:

*Like I didn't have to raise my hand to go to one of my team mate's desk to ask them about, you know, what do you think about crocodiles and reproduction, or do you have any notes about DDT and Borneo.... I guess it was the trust thing, and once we gained the trust it was easy going from there. But it was like the trust was always there. Like from the first day, like, this is how it is going to be, and that's how it was.*

Florencia expressed this freedom for consultation as a collective responsibility:

*I remember all the books were in the back of the class, and there was a Browser that we used for looking up books. And I remember everyone telling each other that when you look up a book for yourself, try to find at least one book for someone else to help them with their research. Then when I found a book for someone else, I would say, “Look, I found you this book—you owe me.”*

Florencia also explained how taking on the teaching role in the jigsaw groups led to the realization that she had to learn more than she herself had researched.

*You know when you work on something for so long, you kind of get attached to your information, to your research, and I was really attached to mine.... And it seemed really hard to answer questions about someone's part that you didn't even write. But that was the thing: When you presented it [your team's research], it was no longer my part or her part, it was our part. So we learned we had to take responsibility for the whole thing.*

## Reflection

Reflection is defined by Bruner as “making sense, going ‘meta,’ turning around on what one has learned...., even thinking about one’s thinking” (1996, p88). Under various names—metacognitive awareness, self-monitoring of one’s comprehension etc—reflection has become a prominent objective of “learning how to learn” strategic learning. The FCL students expressed the basic idea indirectly, focusing—as Florencia did just above--on awareness that was prompted by, and derivative of, the various collaborative activities:

Hanadora: *It really helped you to see it from other people’s point of view, and then you really knew what you needed to go back to and to write more clearly—to work on.*

Jonathan: *When you have to explain your positions, thoughts, and beliefs more thoroughly, it helps to have an open mind. Because when you delve deeper into your reasoning or logic, you usually see similarities between your view and different opposing views.*

Florencia: *I had gotten into the habit at one time of just taking the exact thing out of the book, and [the teacher] would ask me, “OK, but how would YOU say it?”...It was one thing for me to revise and reform an idea, but at the same time that idea would manifest itself differently in the paper itself.... I have to put that concept into play with the WHOLE question being asked. If the topic was sea otters, then I had to take my idea back and fit it into the big picture concerning SEA OTTERS and so forth. Putting it into motion was different than KNOWING it itself.*

## Culture

In Bruner’s framework, “In the Oakland project, Ann Brown has joined agency and collaboration together in the design of classroom culture.” Elsewhere, he adds a comment about the significance of that joining: “They need to be treated together, else learning is made to seem either too solo or not solo enough” (1996, p92).<sup>iv</sup>

When Martha Rutherford, the teacher, read a draft of this talk and saw the four features that Bruner had singled out, she wrote back:

In many ways, the construction of culture in the classroom is the sum of the three, with the addition of **learning stuff that matters**. The kids saw themselves as engaged in important work...and they were in an environment where Bruner's notions of agency, reflection and collaboration, a shared culture that valued and fostered academic excellence, emerged.

As teachers we have an opportunity to co-build a dynamic educational cultural community that fosters taking control of your mental activity in a way that is powerful and generative—which means folks have to reflect on what they are doing, as we are doing [now] about this very topic. And that means thinking through things in the company of others. This shared work is part of the stuff that makes up a culture.

What is scary is that...there is always a classroom culture. The challenge is what we (teachers, kids, parents) do with it. In way too many places the pervasive culture is that kids aren't very smart. But what a difference when we know and act on the **belief that kids are smart** (Rutherford, e-mail communication 31 August, 2005).

### The Longitudinal Impact of this Classroom Culture

This way of conceiving the relationship between individual development and the recurring activities of a specific educational culture inevitably raises the question of the impact of FCL beyond the year that students were in that class. In the group and individual interviews, the students mentioned several enduring effects, including literacy competencies in both writing and reading, analytical thinking, and leadership:

Nwaoha: *I know there was a lot of revision.*

Hanadora: *That is for sure! Like go back and rewrite this. Yea, it was frustrating. We would write everything like 100 times.*

Nwaoha: *Yes, over and over again. One thing I can say though is that although I hate **writing**, I am good at it, and it is probably because we had to write ten page—twenty page papers in elementary school.*

Adaoha: *Yes, that is true for me too. Those were the hardest papers I ever wrote, and in the rest of school all we ever had to write was one- or three-page papers, and I would always get an "A" or a "B", and I could just write it out at the last minute....*

Nwaoha: *Because you utilized those techniques (laughs).*

Florencia: *I remember when I was in our class and I really struggled with **reading** some of the stuff we had to read.... There were no kids' books for DDT and we would use RT to*

*read that stuff... "Clarify" that was the word, you were always asking us to clarify.... [Later] I could read chapters and chapters in books and pull out what I need, and all that was a breeze for me because I had the experience.... You'd be surprised how many people don't know how to read that way.*

Nwaoha [now studying engineering]: *What supported that **analytical thinking** was we actually discussed issues... and we learned to look at ALL of the effects, and we learned from the endangered species case that everything had a domino effect.... Instead of just looking at something in the now, I actually had to analyze what was going to happen in the future, and what had already happened in the past, to make the best decision.... And everything that I learned them I still use today. That is the weird part, the uncanny thing about it, it is just like I still use the same skills and the same tools. Since I am doing engineering, I really need to use that analytical thinking.... Nothing comes without repetition and practice, so learning those things when I was young meant that I could practice them all through.*

Jonathan [now becoming a teacher]: *I think that working in social groups is very good, because part of the reason you go to school is for social development—so you can be productive in a social setting like a group project or a group assignment and learn roles like **leadership** and how to play your part.... FCL was my first—I won't say only, because I know I had other group projects—but it was the most memorable group project for me; it is the one that sticks out.... It also helps me because I talk to my kids and not at them—well, sometimes I do, but I always give them a chance to respond, challenge, question and disagree with me as long as they talk respectfully and honestly.... And that is something I got from FCL.*

Finally, Florencia spoke eloquently about how what she took from FCL sustained her during subsequent barren school years:

Florencia: *There was a time in HIGH SCHOOL where I hit a slump and I had a moment of self-evaluation as to why I felt that way. I realized learning wasn't fun anymore for me I had to sit down and remember when it was. The FCL period was that for me. That experience gave me something to look back on to remember and HOLD on to. I told my mother that FCL introduced me to that state of mind that LOVED to learn. That passion and thirst for learning was one of the many things that is still with me today... my whole thought process was shaped from that one significant period in my life. They were encouraging us. They wanted us to succeed. They spoke as if we were destined to succeed. People believed in you every step of the way. Leading us to believe that the knowledge was ours to possess. Being able to have that "power" was what made all the difference. When I would feel myself getting mentally drained or exhausted I would remember the FCL project the prospect and hopes I had for myself. To think back on FCL was a boost of learning adrenaline.... I was David and ignorance was Goliath and I knocked it stone cold.*

We have access to the voices of these five students because they were the ones Rutherford was able to contact. One must ask, therefore how we can consider them representative of the much larger group of FCL students over the several years of the program.

Admittedly, there would be variability in the content of a larger group of responses, and variability in individual articulateness as well. Moreover, if one had information on a larger set of post-FCL educational and work biographies, there would presumably be variation in the extent of the resiliency in the face of future impoverishment that Florencia describes for herself.

My argument for representativeness rests on cohesion and coherence within the program itself—on the interlocking structures of collaborative work and collective responsibility that was built into FCL by design. The amount of individual variability in engagement and uptake so characteristic of most classroom environments seems, for that reason, less likely here.

In her own discussions of the FCL design, Brown consistently maintained that “The whole really is greater than the sum of its parts” (1992, p166). The same argument is made by Stigler & Hiebert from their analysis of videotaped math and science lessons from the U.S., France and Germany:

If teaching is a system, then each feature, by itself, doesn't say much about the kind of teaching that is going on. What is important is how the features fit together to form a whole. How does one feature connect with the next one? How does an activity near the end of the lesson link back with one at the beginning? This is a very different way to think about teaching (Stigler & Hiebert 1999, p 75).

In all these respects, FCL can provide one example of “best practices” that can benefit all children.

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## Notes

<sup>i</sup> Because FCL had a strong emphasis on academic writing, this longitudinal research was funded through a multi-year Spencer Foundation Senior Scholar Grant to Cazden for research on “The teaching of writing in the English-writing world.” Rutherford and I planned the interviews together. They included questions about what the students remembered about FCL and any long-term impact it may have had in their lives. Rutherford is now writing a book, entitled “Words are our Power” (a quote from one of the interviews). She will integrate what she learned as the FCL teacher with her subsequent experience working with teachers in various parts of the U.S., especially in indigenous (Yupik) bush communities in southwest Alaska.

<sup>ii</sup> Designed as external, interactional support for the internal cognitive activities that expert readers perform, RT discussions provide practice in four comprehension strategies: questioning the main points, clarifying vocabulary, concepts, inferences etc.; summarizing what’s been learned in a paragraph or section; and where appropriate predicting what information may be expected to follow (Palincsar & Brown, 1984). Through repeated RT experience, the discussion format became less formalized and was appropriated by students in their individual research reading and also in their Jigsaw teaching repertoire.

<sup>iii</sup> 1. “A great deal of academic learning, though not everyday learning, is active, strategic, self-conscious, self-motivated, and purposeful.

2. Classrooms as settings for multiple Zones of Proximal Development

3. Legitimation of differences

4. A community of discourse

5. Community of practice

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6. Deep disciplinary understanding

7. Developing understanding within a domain” (Brown, 1994, pp 9-11).

<sup>iv</sup> For my agreement with Bruner on this point, see Cazden 2001, Chapter Four, especially pp 75-77, on Internalization, Appropriation, and Constructivism.