

THE SCIENCE SKILLS CENTER

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Overview

Brooklyn, New York's Science Skills Center High School for Science, Technology and the Creative Arts is now in what is actually its third incarnation. It began initially in 1979 as the project of some African-American scientists and teachers who wanted to "encourage young minority students to pursue careers in science and mathematics."¹ It was then a Saturday program held in the basement of the home of one of its founders. Six years later, it acquired a wing of a public school and expanded to a daily after-school and summer program, as well as continuing to hold its Saturday sessions. As of 1993, the Science Skills Center (henceforth SSC) opened as one of New York's new small high schools. It had obtained the joint sponsorship of the New Visions project of the Fund for New York City Public Education -- a Manhattan group which funnels philanthropic support into ventures that have been carefully scanned and selected. The Fund sponsored 22 of the first group of New York's new small high schools, of which SSC was one.

Today the Center has the first three floors of a former warehouse. It is perched on the slope that is the ramp to the Manhattan Bridge linking Brooklyn and Manhattan. It has 550 students in grades 9 to 12, 32 teachers, and one charging principal. "Charging" seems an apt adjective as he appears almost constantly on the move -- typically rushing, but occasionally ambling -- and only rarely sitting or attending to desk work during the school day. As a visitor, I stood in the school office one February day and responded to a question about my presence with "I'm trying to catch up with Mr. Johnson." Only partly in jest, and with a

semi-wistful smile, his secretary replied "Good luck: I've been trying since October."

Yet Principal Michael Johnson is also an extremely thoughtful man, and obviously can be pensive and reflective as well as seemingly propelled. He is a writer, and several of his articles disclose the man, baring his assumptions and commitments. Johnson seems to be another person during the day, as he alternately charges and saunters around the building greeting students, high-fiving some, patting others, bantering politely with some and telling others to remove their hats. (He apparently doesn't hesitate either to invade classrooms to confiscate hats.)

The Science Skills Center is one of the approximately 100 small high schools New York City has produced in the last five years. It is atypical in many ways from most of the City's high schools, and even from its fellow new schools -- atypical in its auspices and genesis; in its focus; in its aspirations; in its staff; and in the school's unique culture and the climate or 'personality' it projects.

Principal Johnson escorts visitors around the building with a great deal of justifiable pride. It is clean, and the students -- though clearly not the tightly disciplined and regimented group I had been led to believe I would find -- appear generally orderly and good natured. Many of them greet Johnson as they pass, and he obviously knows an impressive number of them and has comments for many. Johnson is pleased to have a chance to show off the building's assets -- and he has, indeed, been successful in acquiring some impressive ones. As of next Fall, he reports, there will be one computer for every six students enrolled, multiple computer labs, a distance learning lab, and a school library that is largely electronic. There is also a spanking new state-of-the-art robotics lab which could leave most high schools envious.

The SSC has established connections with the Brooklyn branch of Polytechnic University only a couple of blocks away. Its students take courses there, some of its faculty have taught at SSC, and Poly gives special scholarships to SSC students. Although I saw no direct evidence of it, there is an on-going partnership with the University's Center for Youth in Engineering and Science. University students reportedly serve as mentors and tutors for members of the SSC's junior chapter of the National Association of Black Engineers.² There is also an unusual collaboration with the American Council of Learned Societies which has made SSC the first high school in Brooklyn with a Chinese Scholar in Residence. He is a teacher from The Inner Mongolia Teachers University Affiliated Middle School, and at SSC he offers courses in both Chinese history and language.

The Polytechnic affiliation is understandable in light of the school's science theme. The emphasis on China, however, is another story. It comes from Mr. Johnson's conviction that China's vast territory and resources will constitute a major economic frontier in the 21st century -- and his determination to give his graduates an advantage in pursuing the opportunities to open in that connection. Next year the Council of Learned Societies will be funding two Chinese Scholars in Residence for SSC. Johnson hopes eventually to have a Technology Institute in the school, and a Foreign Affairs Institute, as well as a Chinese Institute.

The Fundamental Presuppositions

There is another theme that appears a running sub-text at the Science Skills Center: As of 1996, about 85% of its students were African American (with an additional 9% Latino). Although Mr. Johnson does not emphasize it prominently in talking with a white visitor, it is clear that

he has a strong sense of the inequities doled out to minorities by 'the system' -- our social structure and cultural expectations, economic and political arrangements, as well as by our educational system. His high expectations of all students appear fueled at least in part by this conviction and the resentments it generates. Although I heard little discussion of them, one gets the sense at the school that a well worked out set of assumptions undergird Michael Johnson's hopes for SSC. He has written that the existing educational system "was designed to destroy our children." In particular, "science and mathematics education has been constructed as a political, economical and social barrier in order to maintain African-American and Latino communities in a permanent state of underdevelopment."³

Moreover, the effects of the negative circumstances in which many African-Americans must live -- the poverty, the powerlessness, the denigrating assessments and expectations of the dominant society -- have been exacerbated by the attitudes that Blacks themselves have come to assume. Since schools have been stacked against them, and intellectual accomplishment limited to the culturally dominant group, many Black youth have rejected academic achievement altogether, as "acting white."⁴ Yet education, feels Johnson, is their only hope, "a lifeboat in a sea of trouble."⁵

What must happen, then, is nothing less than a movement centered on "Black intellectualism." "[T]he reclamation of academic achievement as a theme in African-American culture...[is]...a major task" that must be undertaken.⁶ It must happen, of course, outside schools as well as in, if African-American youngsters are not to see academic success as a form of cultural betrayal. According to Johnson's analysis, under present cultural conditions, African American youth have three options: they can

choose "cultural suicide" by denying their "Blackness" and abandoning it by coming to "act white"; they can retain a spiritual connection to their race, even while rejecting a restricting definition of it, and pursue a more universal and transcendent vision of humanity (as, for instance, Paul Robeson did); or they can wage "cultural resistance against the racist assumptions and prejudices of the dominant society," even while rejecting "the distorted cultural values" of many members of their own racial group.⁷

From all appearances, Michael Johnson wants students at the Science Skills Center to adopt the third of these options. In a study of his honor roll students he found that for all of them "there was some sense that their achievement academically was a snub or 'in your face' to all of those who felt that they were prevented from being good at academic work simply because of their race."⁸ It is clearly not just the oppressors who must be combatted. It is also those within the Black community who have narrowed its culture with their anti-intellectualism: "To equate so-called 'proper English' with 'speaking White,' wrote Johnson, "is condescending." "Our students ... are in desperate need of educators and a society who will tell them that they are fully capable of mastering English and all other subject areas."⁹

Someone must have the courage to tell our young people that, for better or worse, English is their language and they must learn how to make it work for them.

Johnson wants his students to see themselves as intellectual beings and to see their race as just as capable of intellectual accomplishment and contribution as any other. The reasons why they have not realized this potential, he is convinced, are not solely the social, economic, and political elements which constitute 'the system.' It is equally a matter of

their own response to that system, which for many youngsters has featured a rejection of school and its values: cultivating intelligence, acquiring knowledge, seeking understanding. While individuals and their families can do little directly to alter the first set of these factors, it is well within their power to control the second. And this is where Johnson focuses. The main challenge to school success for young African-Americans is their own attitude and cultural orientation. Thus, the major challenge a school must face in dealing successfully with them is establishing the right student culture. Accordingly, this is where Johnson invests the bulk of his effort.

He wants youngsters to realize that the biggest difference between success and failure is effort. Thus, he looks for evidence of, and does his best to cultivate within students, a healthy commitment to a work ethic -- as well as a healthy respect for affairs of the mind and a recognition that school is the best chance most of them will ever have for a good life. He sees school success primarily in terms of the will and determination to work hard. And the primary object of their efforts must be the academic knowledge most central to furthering their education beyond high school. He has no interest in encouraging them along the more familiar success routes for minorities, athletics and entertainment. (Of the Center incarnation that preceded today's SSC, Johnson wrote "Physical education, music, etc. are played down in favor of subjects that the Center considers more important -- science, mathematics, and language arts."¹⁰)

Academic learning is primary and most fundamental, though it must be abetted by an enculturation in mainstream mores: how to dress, how to interact politely on a middle class model, how to sustain a conversation, how to comport one's self in a job interview all consist of particular knowledge and skills important to the personal advancement Michael

Johnson wants for his students. He works hard inventing contexts for imparting this sort of knowledge and ability. And he only half jokes about offering a course titled "Manners 101."¹¹

Johnson is a walking advertisement for the Protestant Ethic, with its entwining of the morally virtuous with the traits that bring success. He himself embodies and reflects it, and it his guide for directing children. It is also the message he wants to instill in them: hard work and its associated virtues are the way to the good life in terms of both moral triumph and worldly success. He passionately wants both for his students. Schools should help make young people virtuous by deliberately cultivating within them the necessary will and determination, and they should point youngsters toward success by helping them to acquire the knowledge the world prizes and rewards. There is also an obligation to help one's fellows and to help raise up the community -- to accept the value that "we truly succeed when we all succeed." Or, as elsewhere put, "winning does not mean coming in first; it means that all must finish the race."¹² So community and brotherhood and altruism are among the values held up to youngsters. Nevertheless, this message seems a little less strong and pervasive than the obligation to make something of one's self.

The Program

A lot of what schools should emphasize, and how, follows from the foundation just sketched. Johnson does his best to make work rewarding. There are award assemblies (for parents and community members as well as for school folk), and there are plaques and speeches and recognition for those achieving "The Principal's Honor Roll," "The Assistant Principal's Honor Roll," "The School Honor Roll," or earning notice as "On the Way to Success," a "Magnificent Mid-Termer," a "Fabulous Finalist," or among "The

Talented Tenth."¹³ These and other pats on the back are proffered frequently as encouragement for youngsters moving -- even at snail's pace -- toward the right attitude and successful performance.

Cultivating the work ethic is also a matter of having students understand the need for it. And that means giving them the unvarnished truth about how well they are doing. Critics have justifiably accused urban schools of racism in their awarding of passing grades to minority students for what is actually failing work. The result is that when youngsters who have been receiving satisfactory grades encounter some external test, they can be shocked to discover they cannot handle it at all. (Recall the exposes of several years ago, revealing high school graduates who were functionally illiterate.) This kind of misrepresentation does not occur at the Science Skills Center, and in fact, according to Johnson, there is a closer correlation here between grades and Regents exam scores than in any other high school in New York City. More than one teacher commented on their unusual freedom to 'tell it like it is' in their grading of students. Accordingly, in this school there are lots of failing grades. At the end of 1996-97's first semester, only 102 students passed all of their courses, and 61 failed all. Departments ran high failure rates, with 54% failing in Mathematics, 47% in Science, 40% in English, and 37% in Social Studies. At the end of the 1996 Spring semester, failures were also high, with a 44% rate in English and 45% in Math. The percentage passing the Regents examinations ranged from 31% in Chemistry to 70% in Physics. (For a science school, a somewhat surprising 58% and 63% passed social studies Regents, however, in Global Studies and US History and Government, respectively.)

Students at the present SSC high school differ from those of the first two versions of the SSC in that the former were younger (aged 7-12), all

were on or above grade level, and most brought "top academic scores." They were middle class students whose families were willing to go out of their way to enroll their children in a special enrichment program supplementing regular school.¹⁴ Today's SSC students are older, they include other racial/ethnic groups even though African-Americans remain a large majority, they are considerably more diverse as to academic achievement, and as of 1995-96, a third of the student population qualified for free or reduced cost lunches. (Estimates held the 1996-97 figures to have risen to half.)

SSC seems to attract more serious and academically-oriented students than the average. Its 1994-95 School Report from the New York City Board of Education showed it to have only half the number of overage students as the City's average high school. It had a higher percentage of students performing at or above the 50th percentile in both Reading and Math -- 66% versus 50% in Reading, and 52% versus 41% in Math. And its entering freshman class contained significantly higher percentages of students who had passed ninth grade State math and science exams than did the average City high school.

In the interests of equity, however, students attending New York City high schools of choice must be selected in such fashion that 16% of those admitted are below average readers, and only 16% are above grade level. The remaining 68% should consist of youngsters reading on grade level. Thus each entering SSC class contains at least some youngsters who have not previously been academically successful. They are admitted to SSC but it is clear that Mr. Johnson is unwilling to have them continue along their prior path. They are bombarded with messages about the importance of education, the need for commitment to it, and the effort needed to achieve it. Johnson addresses them on it, they are publicly and lavishly

rewarded for progress toward it, and posters in the halls proclaim messages such as these:

"Whether you think you can or you think you can't ... You're Right!"

"If you believe it, you can achieve it."

"You are the sum total of your choices."

"No one is a failure who keeps trying."

"Today's preparation determines tomorrow's success."

"Homework counts ... Learn Good Study Habits."

It quickly becomes clear, however, that such encouragement and inspiration are not always effective. As with other school populations, not all of those enrolled at SSC turn out to be earnest young scholars. What is quite atypical about them, however, in relation to other urban high school populations is their decorum. These youngsters don't live with rules maintaining rigid discipline. They talk and laugh in the halls and many ignore the prohibition banning hats and coats as in-school wear. On the other hand, dangerously low-slung jeans are not in evidence, nor extremely short skirts, nor trailing, untied shoe laces, and there are no 'walkmen.' Moreover, one observes no shouting or raucous behavior in the halls, and there is no rough-housing there or in classrooms. Many students are clearly less than enthralled in their classes, and there is some whispering or nodding or attention to homework for another class; but there are no major disruptions and courtesy is fairly standard practice.

The Participants

As the school's adults explain it, even kids who are not particularly motivated want to remain here because SSC is a safe place to be and a stable, predictable environment. A survey of a year or so ago confirmed its safety to be the school's strongest drawing card among its students.

For a number, this evidently functions as sufficient enticement. Their daily attendance rate is considered above City averages (94% to 85% in 1994-95) and their suspension rates are an even sharper contrast, of 1 to 4.

Yet SSC is not necessarily a good place to teach. Several of the staff noted that in the relatively short time span since the Science Skills Center High School has been open -- three years -- most of its original teaching staff have left. And during the last school year and this, the school lost both an assistant principal and an interim successor. Conclusions are difficult to draw, however. As Mr. Johnson accurately notes, when unsympathetic staff leave a *Progressively* -oriented school, that is often viewed a plus not a minus. Whether departures from SSC ought to be viewed similarly remains a question. It is the case, however, that one visitor who wrote positively about the SSC noted Mr. Johnson's "unapologetically autocratic style" and alluded to principal-teacher controversy.¹⁵

The present staff includes three teachers with doctorates, Mr. Johnson proudly reports, and it is quite ethnically diverse, including several Asians, South Americans, Haitians, a Russian, and a Nigerian. But teachers room conversation suggests that it is also an atypically young staff with about a third of the teachers under 30. Several are brand new and feel they can obtain little help and guidance. Since I wanted to talk with teachers, I asked about department meetings scheduled for the week I was there. There apparently were none. It seems that such meetings are rare and infrequent. The principal reports that he meets often with small groups and that committees meet regularly. But I was told that as of February there had been only one full-faculty meeting this year. It occurred in October and dealt with computers, but there's been no

follow-up.

Clearly some of the teachers need help they are not getting. And all might well benefit from encouragement, as well as from structures and occasions designed to generate professional exchange, interaction, and cooperation among them. It is difficult to tell whether the notable absence of such arrangements arises from the demands Mr. Johnson's chosen role places on him, whether it is a matter of his relative inexperience as an educator and school administrator, whether it is the lack of an assistant principal, or whether it follows from the principal's education-related assumptions and convictions. Recall that he sees effective education as largely a matter of the will and determination students bring to it. Although he has alluded to the importance of teacher motivation in his writings ("Science teachers ... must present their material as if they were 'educational salespersons' who want the consumer (student) to purchase (learn to love) their product"¹⁶), he has evidently addressed little attention to how they might accomplish this -- or how they ought to face and meet the many other daily challenges of the classroom. Staff development has not been part of the program.

Yet SSC holds high aspirations for all of those enrolled. Johnson speaks of "accelerated" work for all, and he is determined to have all SSC students -- even including those officially designated handicapped -- pass the demanding, college-preparatory Regents exams in all major subjects. It is by no means easy and obvious, even to an experienced teaching staff, just how to bring this off. And as the national effort of a decade attests, it is likely to require detailed curricular analysis and arrangement, and careful attention to crafting instructional strategy and organizational structure -- none of which seems to be getting much heed.

I observed real concern and effort on the part of the staff to help

youngsters attend and comprehend. One teacher had obtained authorization to organize students failing a course the previous semester into a single section for repeating it. She had a well-paced quiz game going, but at the expense of much deliberative learning or analysis. Otherwise, the classes I observed were largely the conventional combination of teacher lecture plus recitation interspersed with occasional brief discussion questions. The only evidence I observed of any direct schoolwide attention to pedagogy was that every teacher has on the blackboard for every class the word "Aim," followed by a brief statement or question identifying the day's lesson. There were few novel or particularly innovative activities taking place, but these are not really called for in a school which fashions itself as traditional. What *is* essential to effective teaching, however, is that the students involved be attentive to it. I found students relatively polite to their teachers, not flaunting inattention or misbehaving. But I saw no classes without substantial numbers who seemed peripheral at best, detached from the discussion or other activity taking place.

Teachers appear to be interacting sympathetically and supportively with their students. One young beginning teacher poignantly praised his English class, telling them "You sometimes annoy me and you wear me out -- but today you reminded me of why I became a teacher." (They had successfully converted Shakespeare's Seven Ages of Man from The Bard's pessimistic rendering to an optimistic one.)

Parents are welcomed at SSC and office staff report that Mr. Johnson will drop almost anything else to talk with a parent who wants to see him. Special topic workshops are held occasionally for parents. Families are urged to attend the ceremonies honoring scholastic accomplishment and some parents have played a more active role, organizing a dance for students, assisting with the school's move, and proctoring practice

Regents examinations.

The Test Score Story

Recall that the first and second incarnations of the SSC were enrichment programs for superior students, enrolling youngsters whose parents were willing to get them to Saturday programs or summer programs, or after-school programs. Many of these students, according to Johnson, were high achievers. Recall also Mr. Johnson's determination to have the world recognize that African-American youngsters have intellectual potential. Looking around for a way to demonstrate this in convincing fashion, he hit on using standardized tests. His first attempts met with stunning success: in 1988 he obtained permission to administer the 10th grade New York State Regents biology exam to youngsters attending his Center. They studied biology every day after school for two hours and for four on Saturdays. In May of 1989, 16 fourth- to seventh-graders enrolled in the SSC took and passed the high school Regents exam -- with scores ranging from 65 for one 5th-grader to 85 for another in 6th grade.

The experience not only attracted considerable attention to the Center. It also caused the staff "to think a great deal about the art of taking tests... It seemed that many of the low scores earned by minority students in the public school system were more a reflection of not understanding the key elements of taking a test than of their ability to assimilate the subject matter." This recommended a course of action. "To prepare for the Regents examination, 'test-taking' exercises were done with the students, sometimes as a separate class and sometimes as part of a biology lesson. One of the most important points was learning to answer the questions posed by the examiner...." But the youngsters were

also taught "how to dissect multiple-choice questions, filter out unnecessary data, analyze the remaining data (the givens), time themselves, relax before an examination, and, finally, check their answers after completing the examination...."¹⁷

Around town, Johnson is known for his emphasis on test scores -- and a *New York Times Magazine* article about the school bore the title "Scores Count." The reputation is earned but a bit deceptive. There is no doubt that scores are emphasized at SSC -- as contrasted with more Progressive schools where they are usually downplayed or testing even avoided altogether. But in Johnson's scheme of things they are important means, not ends in themselves. He correctly sees standardized tests as one of the major gatekeeping mechanisms in determining which students get to college -- and which college. And because they are standardized, impressive test scores are a good way to persuade the world as well as his students that they have intellectual prowess. He accurately concludes that his aspirations for his students will require them to be successful test-takers. For these several reasons, then, tests are emphasized at SSC.

Yet when one questions Michael Johnson about what an ideal graduate of his school would look like, there is no mention of fancy scores -- which he readily acknowledges are totally irrelevant to the capabilities and dispositions he seeks. His ideal graduate, in fact, has many of the qualities a Progressive educator would name. He or she is a self-starting learner, hungers for knowledge, is ethically questioning, reflective, articulate and a good writer, disciplined, well-mannered, and flexible. The test scores, he says, have no import and mean nothing in themselves! But these qualities that are the real aim, he adds, don't get you into college. It is the scores that are the vehicle to do that.

The argument is convincing. What follows from it at SSC differs,

however, from how other schools approach the situation. According to Johnson, there are weekly tests, using past Regents questions. There is also a semester-long course on test-taking. It is not unlike the commercial SAT preparation programs to which suburban parents send their children -- except, perhaps, that it is more extensive, deliberate, and reflective about the structure of questions and testmakers' intent in specific questions. There is also a lot of attention to the language of the questions and being precise about it -- which is where Johnson feels many minority youngsters need help.

Even for those who are critical of the emphasis on testing at SSC, and who deny Michael Johnson's conviction that "assessment is the key component that pushes classes" -- or that it ought to be elevated to such a position -- there is much to admire about this program. Not the least of that is Johnson's passionate belief in the potential of his students and his determination that they get the opportunity to realize it. There remains much to be done in building the sort of program that can accomplish such purposes, and SSC could benefit greatly from such a focus for the second three years of its life. Meanwhile, a great deal seems to have been achieved in the first three.

Endnotes

- 1 Michael Johnson, "The Science Skills Center, Brooklyn, New York: Assessing an Accelerated Science Program for African-American and Hispanic Elementary and Junior High School Students Through Advanced Science Examinations," in *This Year in School Science 1990: Assessment in the Service of Instruction*, edited by Audrey B. Champagne, Barbara E. Lovitts & Betty J. Calinger. Washington: American Association for the Advancement of Science, 1990. Chapter 6, pp. 103-124. (Page 104 quoted)

- 2 "Polytechnic and Science Skills Center Initiate Chinese Cultural Program," *The City Sun*, October 16-23, 1996, p. 16.
- 3 Michael A. Johnson, "From New Vision to Supervision: The Design and Development of a New York City High School." Term paper, Bank Street College. n.d. (1994)
- 4 The term is that of John Ogbu and Signithia Fordham, in "Black Students: School Success Coping with the Burden of Acting White," *Urban Review*, 1986 (18:3), pp. 176-206.
- 5 Michael Johnson, "Factors Influencing African-American High School Honor Roll Students." Research Project. March 31, 1995, p. 27.
- 6 *Ibid.*, pp. 26 and 19.
- 7 *Ibid.*, p. 22.
- 8 *Ibid.*, p. 18
- 9 Michael Johnson, "Words Can Hurt Us: 'Ebonics' and African-American Student Achievement." Unpublished paper. n.d., pp. 1 and 3
- 10 "...Assessing an Accelerated Science Program...", *op. cit.*, p. 117
- 11 Sara Mosle, "Scores Count," *New York Times Magazine*, September 8, 1996, pp. 41-45. Page 45 quoted.
- 12 "Factors Influencing..." *op. cit.*, p. 19; and "...Assessing an Accelerated Science Program," *op. cit.*, p. 106.
- 13 "Factors Influencing ... High School Honor Roll Students," *op. cit.*, p. 2
- 14 "From New Vision..." *op. cit.*
- 15 Mosle, *op. cit.*, p. 44
- 16 "...Assessing an Accelerated Science Program..." *op. cit.*, p. 109
- 17 *Ibid.*, pp. 107, 108, 109