

PRESENTATION OF GOAL 3

1. Black Experience in Physics Education

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Blacks in significant numbers have not opted to pursue occupations in the fields of science or engineering for many reasons. I would like to talk about four which I feel are very important contributors to our record of low productivity. They are:

1. Apathy and low motivation
2. Lack of discipline
3. Poor mathematical and science preparation
4. Lack of financial assistance.

The first two (apathy, low motivation, and discipline) usually stem from the same roots. Most Blacks entering high school and college have suffered from cultural, economic, and social deprivation. They live in an environment that has not provided them with role models or images of success in the fields of science and engineering. Most Blacks are the first generation of college students and few families show any history of professional achievement. Many have attended elementary and high schools that have given them a weak academic preparation, which has induced a very high frustration level. These factors are in large measure responsible for the high dropout rate of Blacks experienced at the college level.

Both the white and black press have reported a dismal picture relative to the opportunities of employment in the sciences and engineering. I feel certain this information has had a detrimental influence on Blacks, yet the truth is that the opportunities for Blacks in these fields are unlimited. Federally sponsored research and development mandates that recipients of government funds must show through affirmative action that they are equal opportunity employers. Since approximately one-half the research in this country is sponsored by the Federal Government, it is obvious that contractors will be hard pressed to show a representative number of Blacks and other minorities based on our current record of productivity. In spite of these unlimited horizons, we are experiencing a decrease in the number of students seeking careers in science.

Students taking a college course are looking for answers to the following questions:

1. Does the teacher really care?
2. Is he impartial and fair?
3. How well does he know his subject?
4. What role does this course play in helping me achieve my educational objective?

Many Black students feel that the teacher is not concerned about the problems they are having and that his only interest is his paycheck. S. C. Erickson in his essay "Earning and Learning By the Hour" attempts a comprehensive survey of almost all aspects of a young instructor's career: pedagogical philosophy, motivation of students, learning theories, instructional objectives, techniques of transmitting information, technological teaching aids, grading systems, and examination procedures. Black students who have come up through a predominately Black educational system would be hard pressed to find instructors with a high rating in the above categories.

A very informative paper by Adolph Y. Wilburn dealing with careers in science and engineering for Black Americans appears in the June 14, 1974, issue of Science. Two tables from this paper document where we are and suggest we should take a serious look at our educational priorities.

Table 1 shows the number of Blacks receiving engineering baccalaureate degrees in 1971 amounts to slightly less than 1%. However, when we consider the total number of Blacks actually working today in the field, we represent 0.25% of the engineering work force.

Table 1. Degrees Awarded by U. S. Institutions, Fiscal 1971.

	All Races ^a	Blacks	
		No.	%
Baccalaureate	800,000	45,000 ^b	5.5
Science	217,000		
Engineering	43,000	407	1.0
Master's	195,000		
Science	54,000		
Engineering	16,000		
Doctorate	32,000	400 ^c	1.0
Science	16,000	190	1.0
Engineering	3,500	10	0.3

^aData from the Department of Health, Education, and Welfare, U. S. Office of Education, cited in Statistical Abstract of the U. S., 1972 (Department of Commerce, Bureau of the Census, Washington, D. C., 1972).

^bBased on an unpublished estimate of the Office of Civil Rights, Department of Health, Education, and Welfare, of 90% of the 50,000 Black, fourth-year college students in 1970 who should have been graduated in 1971.

^cBased on (7), and unpublished data from the Office of Scientific Personnel, National Research Council, on the estimated number of doctorates awarded to Blacks.

Table 2 reveals the disproportionate number of Blacks in the field of Education at the Ph. D. level. The fact that we produce twice the percentage of the National average indicates the need to encourage our higher education students to opt for professions where the need is more apparent. These are problems of counseling and motivation.

Table 2. Fields In Which Doctoral Degrees Were Awarded to Blacks, Compared to U. S. Totals, Between Fiscal 1958 and Fiscal 1971.

Field	Blacks		Total U. S. ^a	
	No.	%	No.	%
Physical and Mathematical Sciences	387	14	49,638	21
Engineering	58	2	27,297	11
Life Sciences	479	18	39,292	16
Social Sciences	323	12	38,054	16
Art and Humanities	294	11	33,619	14
Education	1033	38	42,829	18
Professional Fields	129	5	10,524	4
Total	2703	100	241,253	100

^aFrom annual data on doctorates awarded by U. S. institutions, collected by the Office of Scientific Personnel, National Research Council.

Wilburn puts his finger on the problem when he states "Middle-Class Blacks who have themselves benefitted from higher education and who have worked to motivate their children in this direction often find that they cannot afford to pay the more than \$5000 per year required to send an undergraduate to institutions of scientific excellence. In the absence of major changes in the U. S. educational system and the economic levels of Blacks, special support programs will be needed to encourage the children of middle-class Blacks to study science and engineering at these institutions." What Wilburn is saying about our prestigious institutions is also true in our predominantly Black institutions, where the cost per year is approximately \$2500.

Work-study and campus-employment programs have had minimal effect in that they either prolong the time a student spends in college or place a burden on the student in maintaining the life-style of his peers. We cannot expect the student of today to make the sacrifices many of us had to make to acquire higher education.

The need for financial assistance is further evidenced by the fact that the percentage of students entering college from families earning \$6000 or less last year was down to 11.1% from 14.1% in 1972. With upward spiraling inflation, extrapolation to the next few years indicates Black enrollment will be adversely affected. Federal funds are usually directed toward emergency or crisis situations. Government sensitivity to the needs of Blacks is waning; current priorities are inflation, the energy crisis, and ecology.

There are many viable alternatives open to Blacks that were not available 10-15 years ago. These alternatives in most instances are less demanding academically than careers in science and engineering. While it is true we need competent Blacks in all fields, unless we do a better job of counseling and recruiting, we can expect our productivity in engineering and science to decline.

More than half of all Black students are in predominantly White institutions today. But more than 70% of the Blacks being graduated from college are graduated from predominantly Black institutions. Who are the Blacks who become dropouts in our prestigious institutions? They come from the pool of Blacks that Black institutions in the past got their potential Ph.D. caliber students.