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VOCATIONAL EDUCATION, GRADUATION REQUIREMENTS AND SOME BASICS

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If you hear the news that your school district is reducing its vocational offerings to make room for new and different graduation requirements, you should warn the community and urge others to do the same. Students will be short-changed and achievement will decline, even in such important areas as mathematics and science.

In your warnings you should not be too severely critical of your local Board of Education. Schools are still expected to be the seed bed of democracy but they are not always permitted to demonstrate it as a system of representative governance. It may be the local community's children, their money and their future which is at stake; but wisdom is often assumed to lie elsewhere — at the level of state governance. There is nothing wrong with this source of wisdom if it were also the source of all the right questions.

The new requirements, sometimes called the new basics, involve an ideological commitment to well-known orthodoxy. Education is returned to a single dimension, an academic dimension involving large doses of a limited number of subjects including mathematics, science, languages and a few more which can be tested easily by multiple-choice examinations. The questionable premise, also well-known in the claims of classical elitism, is that these subjects have a kind of magical quality, a type of universality which will prepare young people for any future situation.

Even better, they will help students get higher scores in the examinations which predict their ability to survive in college. This means, of course, that when students repeat these subjects in college, they will get better grades than the students who have not taken the subjects in high school. Educational inflation, once the province of the high school, is now rampant at the college level.

A narrow ideological commitment is not without merit or purpose. It serves as a stimulant to political self-esteem and it classifies all students on the side of the angels. Whoever heard of

mathematics or science as the school's dumping ground? And it brings a dignified righteousness to the language of bureaucrats: "we are, let me assure you, faithful to the basics." How can you argue against such reasoning?

What is less often recognized is that an ideological commitment to such an overdose of a few categories of academic subjects is of great negative value in an educational enterprise. When vocational subjects are sacrificed, there is a positive threat to the kinds of achievement which best serve a great many students as well as their communities. The educational system has served rather well, at least until now, by its willingness to make practical concessions to diversity and pragmatism.

In spite of lamentations to the contrary, school board members and school administrators should feel rather pleased with the accomplishments of the educational system, and especially its vocational offerings, in the last decade. If they wish to see failure they need only to look to the boardrooms and executive offices of the steel, oil, semiconductor, or tool industries. Here is where people possess the basics, talk about excellence, offer advice to educators and move bravely toward bankruptcy. Nor is it because the secondary schools teach the wrong subjects that the free market, in its most nearly competitive form, subjects the agricultural sector to intolerable uncertainty and economic trauma. All who lead from the top of this hierarchy also scored high in their standardized college-entrance examinations.

Neither life, nor the real world in which it is lived, is divided into school subjects. School subjects only contrive a relationship with world's reality. They rarely describe it or reflect it. The bridge between school and work offers little more than a hazardous journey. For many it is no better than a leaky boat.

Of all the negative effects of a standardized set of academic graduation requirements (and evaluated by so-called standardized examinations), none is greater than the clash of basic assumptions about students and their educa-

tional progress. Teachers know that there is enormous variation among students even when they begin as first graders. Much of this variation is believed to result from differences in home and family life — the extent to which parents have read to their children and exposed them to other ingredients of literacy. Yet even different children from the same family tend to show a great deal of variation which cannot be explained by differences in such prior exposure.

While teachers in the early grades are quite aware of this variation, they tend to believe that little can be done about it except to measure it and to classify the students. So the early grades of almost every school has its equivalent of "blue birds, red birds" and "yellow birds." The color assignment is designed to confuse parents; the children all know that it means "fast," "medium" or "slow" in their grasp of the symbolism of literacy. There are no similar classifications based on other skills or talents such as leadership, creativity, or initiative. These are not so easily measured. Schools tend to ignore or underrate the things which are difficult to measure.

In the later grades the color designation is dropped but the groupings continue as the school's "tracking" system. Mathematics and science for students in "slow" tracks are quite different from the same subjects in the "fast" track. Yet the labels on the courses remain the same; there are no standards to govern "truth in packaging" in the field of education.

Parents, on the other hand, start with the sentimental idea that the intellectual potential of all children is basically the same. While they recognize that there are some variations among young children, they rely on the school to remove these differences by giving each child the same treatment and obtaining, hopefully, the same results.

Here is where the clash of basic assumptions heightens, a clash which continues throughout the years of compulsory education. Teachers, with compassion and sympathy, continue to reassure parents that every student has an equal chance. Parents continue to believe that the results will be equal. Each is operating from an illusion which is not informed by professional competence. More often they are breaking the Tenth Commandment: each coveting a neighbor's goods, an ideal situation in some far-off place which always remains more imaginary than real.

The harsh reality is that the small variations seen among first graders tend to grow to become large differences among twelfth graders. More importantly, the schools with strong instructional processes and a rich array of opportunities to demonstrate student achievement will be the most successful in accentuating these differences. Other schools, those with

weaker instructional processes or with limited avenues for student achievement will not be as successful in accentuating the growing differences as students progress from one grade to the next. In short, strong schools seek every possible way to enhance the variation as well as the amount of intellectual achievement among students as they move through the system. Weak schools suppress the variations as well as the amount.

When a school is forced to reduce its vocational offerings to make room for new academic graduation requirements, it abandons an important source of desirable variation and it begins moving from strength to weakness. This includes the important areas of achievement in mathematics and science. This is why you should warn your community and urge others to do the same. Many students are going to be losers.

Intelligence is a very complicated affair involving a mixture of all sorts of mental capacities, psychological attitudes, interests, connections for generating high achievement and avenues along which students can exercise their imaginations creatively. To adopt a "one size fits all" approach may work satisfactorily with panty hose or hats but its effect on education is devastating. It fails to cultivate the variations which enhance learning and which expand opportunity and it forces education into a sameness which is dysfunctional for many students.

If any of this is true, the implications for education should be fairly obvious. The highest priority for educational reforms should be at the pre-school level and in the early years of the elementary school. The framework for all subsequent educational achievement is determined at this early stage. Waiting until students have reached the final years of secondary school and then assuming that excellence can be accomplished by a prescribed menu of required subjects is wishful thinking in the extreme.

Second, the high school should be organized to accommodate students with divergent unorthodox kinds of intelligence, not conformist orthodox types. Since all methods of selection by competitive examination must be based on established orthodoxies as well as on conventional ideologies, it is necessary to challenge the educational merit of such an approach. The aim should be to maximize variation, not to suppress it. All students need to learn how to learn, but they should also be encouraged to follow their interests and talents. The basics, whatever they are, should not be viewed as something which precedes, and are thus a prerequisite to, education; the basics are required as a part of a lifelong journey just like other aspects of education.

Finally it should be said that the academic enterprise should be searching for leadership,

creativity, and high achievement in all of the endeavors which challenge the human mind. The current educational reforms, including the sacrificing of vocational programs for the new graduation requirements, can only recognize those students who are very passive and very obedient. Such a system turns out excellent bureaucrats, but rejects or perhaps never notices imaginative or creative types. Perhaps this should not be a surprise. Has anyone failed to notice that America's most vigorous growth industry has been its bureaucracy? Should we not conclude that educational incest is now masquerading under the banner of excellence?

What follows about mathematics could be said about science, foreign languages and maybe other subjects which are crowding vocational education out of the picture. One can be comforted by the possibility that the "crowding out" will not be permanent. After all, even the most important epic of western civilization began with the historic line, "there's no room in the inn."

Mathematical skill is critically important to most situations in life and it is not a trade-off for other subjects; it is compatible with all of them. Students should not be forced to choose between vocational courses and mathematics courses. If a choice is forced upon them, they should be urged to take the courses which give the greatest amount of mathematical understanding — the vocational courses. Indeed, it would make good sense to give mathematics credit for many vocational courses.

To justify this observation it may be helpful to identify three categories of mathematics. First, there is **day-to-day mathematics**, the mathematics that we use in our daily lives. This could also be called conventional mathematics or survival mathematics. Some people refer to this as **basic mathematics** which seems to imply that these needs are the same for everyone, which is clearly not true. Golfers use different mathematics than chess players and truck drivers use different mathematics than horticulturalists. Day-to-day mathematics is determined by one's personal life-style including ones hobbies and avocational interests.

A second category of mathematics can be called **vocational mathematics** or utilization mathematics. It describes all of the mathematics beyond day-to-day mathematics which people need to be successful in their work. It may include very simple skills such as the use of decimals, fractions or exponents and it may extend to more advanced skills of estimating, determining maximum or minimum values or calculating probabilities.

A third category of mathematics can be called **mathematicians' mathematics**. This might involve such considerations as set theory, prime numbers or proofs of theorems. A considerable

amount of this category of mathematics was introduced into secondary education in the late 1950s and early 1960s as the "new math." Schools then came under criticism for not including the skills of balancing a checkbook as well as other day to day and vocational mathematics.

All students should have a chance to experience this kind of mathematics. Yet it is foolish to think that it should be required of everyone. Sometimes it is argued that advanced mathematics teaches one to think. The evidence, however, is not very convincing; the same could be said for expository writing, studying literature or dealing with a management problem.

From the foregoing discussion, the implications for schools facing the new graduation requirements are, again, fairly obvious. First, mathematics, like reading and writing, should be viewed as an activity for extending the ability of students to understand, control and enrich the environment in which they live or are preparing to live. Second, mathematics should be the province of all teachers in the school and particularly those who understand its occupational relevance, the vocational teachers. There are no "territorial rights" for mathematics in a community and this should be a clue that there needn't be any in schools.

Third, the best schools are the ones which are multidimensional, that is, they have many routes for demonstrating outstanding student achievement including the vocational routes which permit high accomplishment in mathematics and science.

This is why you should warn the community, and urge others to do the same, if your school accepts the myopic view that vocational programs should be sacrificed for unidimensional graduation requirements.

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