
Intelligence, Knowledge, and The Hand/Brain Divide



The academic/vocational divide that persists in U.S. schools today is not simply a matter of curriculum, Mr. Rose points out. It is an expression of beliefs about intelligence and the social order that continue to limit the options of large numbers of young people.

BY MIKE ROSE

WE LIVE in a time of much talk about intelligence. Yet we operate with a fairly restricted notion of what that term means, one identified with the verbal and quantitative measures of the schoolhouse and the I.Q. test. And even though scholars like Howard Gardner and Robert Sternberg have helped us broaden our understanding of intelligence — with concepts such as multiple intelligences and practical intelligence — we tend to undervalue, or miss entirely, the many displays of what the mind does every day.¹

I have just finished a long study of the thought it takes to do blue-collar and service work, from welding to waitressing, and it has left me with heightened respect for the intellectual content of such work: the knowledge base, the processing of information, the problem solving and judgment involved. It has also left me with a concern about the way we tend to judge people's intelligence by the work they do.

Consider the number of distinctions we readily make about work that carry with them powerful implications about both the work and the worker. These distinctions are usually expressed as oppositions: brain versus hand, mental versus manual, intellectual versus practical, pure

versus applied, neck-up versus neck-down. All of this is intensified in our high-tech era, and, to be sure, high technology and "symbolic analysis" typically involve advanced formal education and require high levels of analytical skill. What worries me is the way we celebrate the play of mind in such work but diminish and even erase it in other kinds of work, physical and service work particularly. In our schools and industries, as well as in our informal talk, we tend to label entire categories of work and the people associated with them in ways that generalize, erase cognitive variability, and diminish whole traditions of human activity.

One of the most unfortunate of these dichotomies, particularly in the lives of young people, has been the distinction between the academic and the vocational. This distinction characterized the high school curriculum for much of the past century and has defined entire courses of study. Though it has been the focus of significant reform over the past two decades, vocational education — and more generally, the divide between the academic curriculum and the vocational curriculum — has been one of the most long-standing and visible institutional manifestations of our culture's beliefs about hand and brain, mind and work.

In this article, I want to use the academic/vocational split to reflect on some broader educational and cultural issues, for I think that the distinction as it's played out in school has much to teach us, whether or not we're directly involved with the issue of vocational education or, as it is now often called, career and technical education. Let me begin with some history, so that

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we can get a sense of the development of vocational education and the academic/vocational divide.

TASKS and lessons drawn from the world of physical work have been incorporated into the curriculum of schools since the 19th century. Reflecting larger cultural tensions between “practical” and “bookish” pursuits, some reformers sought to create a curriculum that engaged a wider range of the child’s physical and mental capacities.

Physical work was also an element in the remedial program in reform schools for urban youths, and it was central to the restrictive curriculum given to Native Americans and African Americans in segregated institutions. But for some advocates of “manual training,” lessons involving physical tasks were seen as part of every child’s curriculum. Students were not to be separated into a “manual” or an “academic” course of study; everyone could benefit from learning about mechanical principles, the properties of materials, and the use of tools.

The history that follows the early reforms — stretching from the late 1890s to World War I — is consequential and led to a fully developed vocational education program. Essentially what happened is this: the

attempt to reform the general curriculum with manual tasks faded, and a movement began to create an “industrial education” that would be separate from the standard academic course of study. The history is fascinating — if at times disturbing — and demonstrates the truth of an observation made by those who study curriculum reform: any major change in curriculum represents the intersection of multiple social forces and so reflects concerns and debates going on in the culture at large.

Let’s tease out some of these forces and concerns. First, there are the numbers: a growing urban — significantly immigrant — population combines with child labor and compulsory education laws to send many more children to the classroom for longer periods of time. This increase in numbers coincides with and gains further meaning from the era’s changing notions of adolescence, family life, and schooling; from fears about immigrants and concerns about how to educate and socialize them; and from continuing anxiety about the social effects of mass industrialization — particularly labor unrest and the concentration of the urban poor. Some of these issues are still with us in new guise today.

There was also significant lobbying from business to closely align school with work and emphasize job

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training over liberal education. Some powerful educational leaders — the president of Harvard University among them — agreed, arguing that we need to “sort [pupils] by their evident or probable destinies” and prepare them to be “effective economic units.” Organized labor was, at first, wary of such exclusionary vocational training, but eventually it would join in and influence the shape and structure of the emerging vocational education enterprise — mandating, for example, that vocational training would not begin before a child’s basic education had been secured.²

Other elements played a role in the development of vocational education. Proponents of child-study psychology and progressive education, like some earlier critics, wanted to rethink the old-fashioned high school curriculum; they found it too tied to a dated classical tradition and the collegiate course of study. But of particular interest here were those reformers who, following the mood of the times, were calling for more scientific and efficient administration of the schools. These calls for efficiency would intersect with the emerging discipline of mental measurement — chiefly the I.Q. test — leading to a more systematic way of classifying students through assessment of their abilities and life prospects. There was a good deal of talk in educational circles at the time about the limited mental capacity of various immigrant groups and working-class populations, and judgments were rendered designating some students as intellectually suited for abstract thought and others as “manually minded.” Curricula would be developed suitable for each group, which would lead to an effective, if stratified, society.

The vocational education movement would gain national legitimacy in 1917 via the Smith-Hughes Act. The legislation significantly increased the professional ranks of vocational teachers and administrators and encouraged the growth of teacher training programs in vocational education. Although local control was the norm, the new legislation — partially out of a desire to protect the burgeoning vocational programs from the traditional academic elite — would, in essence, mandate separate governing boards, funding streams, and instructional programs. This institutionalized the academic/vocational divide at the administrative as well as the classroom level.

Though vocational education was robust through much of the 20th century — it has a commonsense quality to it as well as the backing of a powerful lobby — it encountered opposition on several fronts. John Dewey was among the first of many to raise concerns about its narrow focus on job training and its separation of young people essentially by social class. “Social

predestination,” he called it.³ And, ironically, by mid-century, several national studies were revealing that vocation was not doing a very good job of preparing students for industry. One of the principal reasons was an unimaginative and restricted curriculum. In addition, there was a mismatch between the curriculum and the workplace, and the workplace itself was constantly changing. Such concerns have been at the heart of more recent calls from government and industry to reform vocational education.

A further issue involved gender stereotyping and racial segregation. Girls were channeled into clerical courses or such courses as home economics; few women were placed in industrial training courses. Black Americans were virtually excluded from many forms of mechanical and technical training. Critics wondered whether vocational education was creating new employment opportunities or was reinforcing the prevailing social order and opportunity structure. Although vocational education legislation in the 1960s and 1970s — in the spirit of the times — addressed such discrimination, the concern remains with us today.

And there is another, not unrelated, matter of inequality. A long line of sociological studies demonstrated systematic bias at play in the way students were placed in various curricular tracks.⁴ (And even in a post-tracking environment, these biases continue to affect course placement and selection.) For all the administrative rationality and meritocratic logic of the differentiated curriculum, academic counseling can be irregular and inconsistent and can be affected by, among other things, parental power and teachers’ and counselors’ beliefs about race and social class. There is troubling evidence, for example, that working-class and racial minority kids with records of achievement comparable to those of their mainstream peers will more frequently end up in general education or in vocational courses.

Finally, of particular concern here, there are the intellectual limitations of vocational education, captured by the authors of a recent historical analysis for the National Center for Research in Vocational Education: “Vocational teachers emphasized job-specific skills to the almost complete exclusion of theoretical content. One result was that the intellectual development of vocational students tended to be limited at a relatively early age.”⁵ This, I think, is a remarkable statement. We charge the school with cognitive development, yet in the very curriculum that places work at its core, we find a restriction of intellectual growth. Here is the fundamental paradox of vocational education as it has been practiced in the United States: its diminishment of the intellectual dimension of common work and of

the people who do it, an extended illustration of the degree to which the hand/brain division runs deep and wide in our social and institutional life.

Criticism of the cognitive content of the vocational curriculum has frequently come from those schooled in the humanities or in the life and physical sciences. While their critique has merit, it also has an unfortunate quality to it. It is typically framed in the very terms that the vocational community rejects and that early legislation tried to protect against: a comparison with the college-prep course of study. Such a critique privileges the academic over the vocational and plays into long-standing turf battles. One could even argue that it reinforces class biases about manual and service work. What intrigues me, though, is that *within* the vocational education enterprise — on its own terms, not comparatively — there has been scant attention paid to the intellectual dimension of common work, to the cognitive possibility of the salon, the workshop, the job site. It is as if vocational had bought into the biases of the culture at large.

Now, this is not to deny that many a vocational instructor has taught well and has made a difference in young people's lives. Such teachers concern themselves with the full development of the students in their charge, provide good counsel, and structure students' experiences to foster both trade skills and a problem-solving cast of mind. When you get up close to good vocational instruction — just as when you get close to work done well — the intellectual content of the practice is clear, though it may not be expressed in typical academic terms.

My concern here is with the core themes of the vocational education profession itself, the dominant discussions in its journals and conferences, its public face. At various points in its history — particularly when it has had to define itself and clarify its goals — vocational education has directly addressed the cognitive dimension of its course of study. But overall, the treatment tends to be brief and intermittent. I surveyed a 30-year span of the field's main journals, and though many topics were covered — from teacher training and development to hot topics like high technology and school-to-work initiatives — there was limited attention overall paid to the cognitive dimension of work.⁶

For example, I found only a handful of articles on

the way students develop knowledge of a field, or on hypothesis testing and problem solving, or on the complex interplay of thought and action. The issues covered, for the most part, weren't framed in a way that gave one a sense of the cognitive base of the subjects students were taking. When topics were covered that had strong cognitive content — such as mathematics or communication — they tended to have a remedial

focus, or they were a response to policy directives from outside the profession, such as a U.S. Department of Labor report on the general cognitive demands of the new workplace. Individual teachers may acknowledge the thought that it takes to do work well, but if, in an educational context, the cognitive features of an entire field of study are muted, there will be intellectual and social consequences for the students involved.



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IN OUR historical overview of vocational education, we saw some of the reasons that, I believe, underlie this culling out of intellectual concerns from vocational. Considerable effort went into developing vocational as a distinct educational program, separate from — even defined in opposition to — the academic curriculum. This separation was justified by the belief, a reasonable one at the time, that the fledgling vocational education project

would be overwhelmed and poached upon by the more powerful academic course of study if it did not have separate curricula, teacher career paths, professional organizations, and funding mechanisms. But, as I noted above, the separation was also justified by theories of intelligence that defined entire social groups as “hand-minded” and others as “abstract-minded.” Combined with these theories was the belief that the purpose of schooling was to create an efficient school system to guide people into their likely positions in the social order. So hand-minded — primarily immigrant and working-class — children would be trained for manual work.

While the institutional separation of vocational had its political and bureaucratic rationale, it also cemented in place the deep biases of the culture with regard to physical versus mental activity. Furthermore, there were no built-in bridging mechanisms between the vocational and academic realms that could enable such creative

interaction as cross-disciplinary discussion that could expand and enlighten, say, the use of tools or the development of literacy.

The result was that the academic and the vocational developed in separate professional spheres, each narrowly defined. And it is the academic course of study, not the vocational, that has been identified as the place where intelligence is manifest. Such separation can't help but play out on the ground in the way schoolpeople talk and in the formal and informal terms and categories they use. Thus a language of abstraction, smarts, and big ideas surrounds the academic course of study, which is symbolically, structurally, and often geographically on the other side of the campus from the domain of the manual, the concrete, the practical, the gritty.

The past two decades have seen a broad range of reforms aimed at the high school. The issue of curricular tracking in general, and the vocational/academic divide in particular, has been integral to a number of them. Dissatisfaction with voc ed has, for example, led to the most significant vocational legislation since Smith-Hughes in 1917, the Carl D. Perkins Vocational Education and Applied Technology Act of 1990. This act was followed by the less-sweeping but complementary School-to-Work Opportunities Act of 1994. The school-to-work legislation expired in 2001, while the Perkins Act was reauthorized after contentious debate in 2006.

What makes this combined legislation particularly relevant to the discussion so far is its stress on amending existing programs or creating new ones to better integrate academic and vocational education, thus providing a richer range of options for careers or for further training or education. So, for example, although they existed before the Perkins Act, since its passage we have seen the growth of career academies (typically, small schools within schools) that, at their best, offer coordinated sequences of academic and vocational courses organized around an occupational theme. Thus the chemistry course in a graphic arts academy that I visited a while back had students engaging concepts and problems related to ink, paper, and printing processes, which carried over to their work in the graphic arts lab, where they were producing small books of essays they had written in their humanities course.

These laws, especially the Perkins Act, were unusual in their emphasis on *both* academic and occupational competency for a broad range of American high-schoolers. This expansive and integrative impulse runs contrary to much earlier voc ed policy. Thus the laws and the reforms they encouraged are collectively of some educational importance. Still, any reform movement

produces widely varied results. As economist and educational researcher Norton Grubb concludes after a comprehensive review of this “new vocationalism” in the schools, many efforts are little more than minor adjustments to the status quo — for example, adding a few written exams to an electronics course or slapping on some prepackaged, lightweight academic materials.⁷ But some efforts are ambitious, involving a cross-section of a school's faculty over many months in developing a curriculum that integrates academic and vocational material. And in a few cases, a visionary faculty has used the reform of voc ed (or career and technical education) as an occasion to reimagine the very structure of high school itself and with it the academic/vocational divide. Drawing both on John Dewey and on recent cognitive psychology, these educators develop curricula that merge rather than reinforce disciplines, that find rich educational content in the occupational world, that blend learning and doing through projects, public presentations, and portfolios of creative and scholarly work.

Unfortunately, such innovation is rare. Intellectual enrichment, when it occurs, is typically achieved by beefing up the vocational side of things with a dollop of traditional academic content and courses. As a practical matter, this makes sense; if a primary goal of the reforms is to make more students eligible for college, then they need to have the prerequisite academic courses. But conceptually, such practice doesn't move us much beyond the definition and segmentation of knowledge codified in early voc ed legislation and played out in its history. Moreover, a related concern is that the culture's biases about mind and work — which have so influenced schooling — are infrequently raised in these reform deliberations. As education scholar Theodore Lewis puts it, vocational knowledge is not perceived as valid school knowledge.⁸

Debates about vocational education, though politically weighty, tend to take place at the margins of school reform efforts. But the vocational/academic divide could become the site of a broadly significant conversation, one that would not only affect voc ed but range far beyond it. Some of those early voc ed issues — e.g., the relationship of school, work, and intellectual development — were never adequately addressed, and they remain, I believe, among the key occupational and educational issues facing us today.

There is the issue of intelligence itself: its definition, the limits of our standard measures of it, and our lack of appreciation of its manifestation in the everyday world. There is the set of cultural assumptions that attribute low intelligence to entire categories of work

and to the people who do that work — often poor people, people of color, and immigrants. There is our impoverished sense of what work, any kind of work, requires and an arrogant denial of the intricate human dimension of technology. For all our talk about the new workplace and the need for smart workers, many believe, as does this manager of a Motorola plant overseas, that “we really need to get the human element out of the process.” What else but human consciousness makes the process work?

There is also the issue of differences in aptitude and interest. Though our schools have put some effort into dealing with this kind of heterogeneity, they end up responding to difference in pretty simplistic ways. We develop limited categories for courses and for placement, which are administratively efficient but cognitively reductive — then we quickly rank-order those categories. For example, given the distinctions we make between the academic and the vocational, difference quickly devolves to deficiency. As one policy expert said to me in exasperation, ideas for vocational programs tend to “get implemented in the lowest, least imaginative form possible.” My sense is that, with a few exceptions, most policy and curricular deliberations about vocational education have embedded in them assumptions of cognitive limitation, and these assumptions shrink our curricular imagination.

To rekindle that imagination, we need to rethink our notions about mind and work, but, hand in hand, we need to reassess long-standing and seemingly self-evident distinctions between levels and kinds of knowledge. Certainly, distinctions can be made; expressions of mind are wide and varied. But there is a tendency — in the school and in the culture at large — to view all knowledge and skill associated with physical work as rudimentary, even primitive, “neck-down” activity. A related issue is that the traditional, and weighty, separations between “pure” and “applied” knowledge, between “skill” and “concept,” between “theoretical” and “practical,” tend to neatly segment a more complex reality. The more time I spend amid different intellectual disciplines and different spheres of work, the less sound I find these distinctions to be. They harden in debates over the purpose of education or in disciplinary and professional power plays, but they blur and morph into one another in actual practice, both blue collar and white.

And then there is the issue, much in public talk these days, of the purpose of work, which gives rise to a cluster of connected issues: meaning and identity, tradition and ethics, values, the human connection. The school has not done a very good job of addressing these

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matters, and when they do appear in conventional vocational courses, the treatment is frequently abstract or trivial, and the students could care less. Yet there are so many moments in the practice of challenging work when values, ethical questions, and connections to self and tradition emerge naturally and with consequence, ripe for thoughtful consideration. Surrounding such issues, influencing them at every level of working life, are the profound effects of social location, economics, and politics. The early architects of vocational education wiped these concerns from the curriculum, and vocational education has been pretty anemic on such topics since. The tragedy here is that young people are at a stage where they’re beginning to realize how important work will be in their lives, how it will frame who they are and what they can do in the world. They are desperate to be somebody, to possess agency and competence, to have a grasp on the forces that affect them. This is not easy to come by — kids are so protected and adults so often inept — but the desire quivers within adolescent life.

ALL OF the above, it seems to me, plays in and out of the basic question, the Jeffersonian question, about the purpose of schooling in a democracy. Throughout the early history of vocational education, both advocates and opponents relied on democratic rhetoric to make their cases: it is democratic to provide all students with a similar course of study — at that time, the academic curriculum — or it is democratic to respond differently to the individual needs of quite different students. As I’ve considered this topic, I don’t think this stark dichotomy is the most fruitful way to frame the debate. The vocational/academic divide leads us to consider the Jeffersonian question in more nuanced ways.

For some critics, schooling should be completely freed of economic motives and vocational content. Though unrealistic and, to a degree, elitist (if you're poor, how can you bleach school of the hope of advancement?), there is merit in this position when one considers how crassly practical some have tried to make schooling. One influential early-20th-century superintendent, for example, wanted to evaluate the curriculum according to each subject's "unit cost" per pupil recitation. But economic motives have long driven mass education in the United States. In addition to his claims of the intellectual, civic, and moral benefits of the common school, Horace Mann devoted an entire report to the school's economic benefit.¹⁰ And one could certainly argue that the strictly academic curriculum has long served as a vocational course of study for the middle and upper classes. It seems that the key issue here is how narrowly or richly "vocation" is conceived and whether the child is defined solely as an economic being.

Furthermore, there are delicate social issues here. How do you encourage young people to consider college, take the right courses, perhaps leave their friends behind, look to work other than the work their parents do — how do you do all that in a way that doesn't diminish who their parents are or how they make a living? Most parents want economic mobility for their children, but enabling this mobility through schooling can be a tricky matter. As one policy analyst I spoke with aptly put it: "How do you honor a student's construction worker father while creating the conditions for his child to not be a construction worker?"

There is also a related issue that can emerge in a school's institutional dynamics: a belittling of the work and the intellectual potential represented in vocational education programs. It is desirable to expand educational opportunity by enriching curriculum and providing more options for matriculation. But this must be done in a way that honors the diverse richness of cognition, that grounds itself in a capacious philosophy of mind. I'm not sure this is often the case. Some reform efforts leave unchanged narrow definitions of disciplines and mental activity and, thereby, contribute to the sense many working-class kids have of scholastic alienation, of disconnection — the feeling that this academic business is not for them.

The core problem, it seems to me, is not that the school offers multiple curricula; in theory, varied courses of study can be enriching. The problem is that, even after the formal demise of tracking, there are biases at play in who gets what curriculum — and the curricular options are built on terribly diminished and self-

fulfilling assumptions about the cognitive capacity of large numbers of students. After a while, students figure this out. To borrow a pertinent phrase from *The Hidden Injuries of Class*, they develop a sense of whose mind is "certified by the school," who is intellectually competent, invested with hope, marked with an aura of futurity.¹¹

Young people at a key developmental juncture have to form their sense of self and their conception of their intelligence within the tensions and restrictions of the academic/vocational divide. They must define themselves, either in compliance or rejection, within these institutional dynamics. One of the results is that some kids — no matter how sharp they may be in other aspects of their lives — come to think of themselves as intellectually inferior, not too bright, a dummy. This can even be the case, as I've witnessed innumerable times, when people dismiss book smarts, mock academic pursuits, and develop identities in opposition to school success. Even as they shun the academic domain, they identify intelligence with it and trap themselves within the very terms they reject.

A number of vocationally oriented students receive mediocre educations. Some are considerably unprepared, and their underpreparation is related to their social class background: poor schools, limited resources, hard times. They tend not to do well in their academic courses, and their performance supports the school's belief that they cannot handle intellectually challenging material. This belief is often reinforced in other ways by the students themselves, by the many indications they give that they just don't like school — and don't trust it, either. The challenge for teachers here is to be clear-headed in separating out a student's poor performance or detachment or defensiveness from intellectual possibility.

There is a related challenge as well: to not assume — as many curriculum developers seem to — that poor academic preparation rules out sustained and serious involvement with core disciplinary topics and material of intellectual consequence. By and large, our schools have responded to underpreparation with reductive and trivial curricula — "skills and drills" — revealing once again assumptions about the cognitive capacity of those students on the vocational side of the vocational/academic divide.

When I read policy papers on reforming vocational or career and technical education, I'm struck by the degree to which the language used to describe these young people is a language of practicality and economic preparation, inflected throughout with a sense of their limitation. There is little sense of promise, of the excite-

ment of cognitive and civic development.

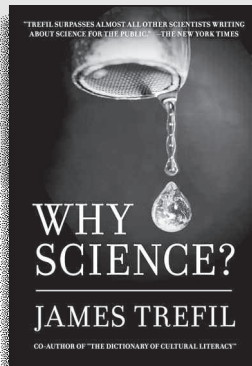
What I'm seeking is a deeper, richer, more involving orientation toward working people and their children, akin to a fundamental political commitment or article of educational faith. It is the kind of belief in human potential that enables social movements, the extraordinary emergence of agency and strategy where little was thought possible. In this regard, it is worth noting that voter registration activist Bob Moses developed his program to teach algebra to children in poor communities from his political organizing experience. In the same way that the civil rights movement assumed that all people are capable of political deliberation and participation, the Algebra Project assumes that all youngsters — absent brain damage — are capable of understanding the conceptual fundamentals of algebra.

It is important to note that, in the early days of debate over vocational education, there were compelling voices articulating this kind of belief in the capacity of the common person and in connecting education to an egalitarian vision of human and cultural development. There were John Dewey and Jane Addams, but there were others as well, academics and state-level policy makers. But that view of mass education disappeared from final policies. We need to reclaim it, for it is highly pertinent today.

Without such bedrock beliefs and commitments, we will never truly bridge the academic/vocational divide. We will continue to take good ideas and dumb them down, for the beliefs about intelligence and the social order that underlie a curriculum are as important as the content of the curriculum itself. It is at this point that democratic principles and educational practice become one, an act of intellectual and civic realization. Those teachers and administrators who work at the breach between the academic and the vocational are engaged in a kind of applied political philosophy. By making the schoolhouse more democratic, they honor the fundamental intelligence of a broad range of human activity and challenge the culture's assumptions about hand and brain.

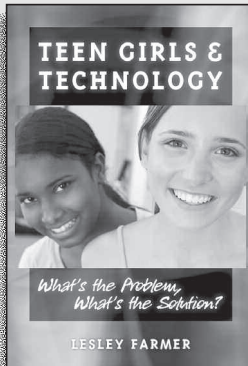
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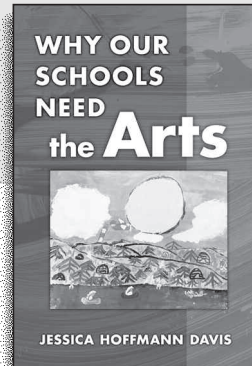
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