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A Reflection on Career and Technical Education, Multiple Pathways, and the Academic-Vocational Divide

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Introduction

We are living in a time of vibrant debate about the high school—debate about its purpose and structure, its curriculum, its place in the early Twenty-First Century's economy and social structure. One of the more compelling themes of this debate, to my mind, has to do with those courses and programs classified as "vocational" (to use the old term) or "career and technical" (to use the new). What place should this longstanding feature of the high school have in the modern curriculum? How can such courses and programs be reformed, made more rigorous, beefed up with or integrated into the academic course of study? How, in fact, should such courses and programs be defined in their various transformations?

Such questions are central to another, not unrelated, discussion: that of "multiple pathways." Though there are a number of definitions of "multiple pathways", some quite different from others, the term signals an attempt to provide a variety of ways for students to complete high school with a challenging curriculum that will lead to further educational and/or occupational options upon graduation. The aforementioned issues and questions involving Vocational/Career and Technical Education are central to many of these multiple pathways. The development of successful multiple pathways approaches, therefore, is integrally connected to Career and Technical Education reform.

The focus of this chapter will be on recent efforts to reform Career and Technical Education (CTE), but will provide an alternative perspective on them, one that, I hope, will contribute to the multiple pathways discussion.

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Career and Technical Education

Much of the recent policy literature on Career and Technical Education (CTE) offers these shared goals and claims:

1.) If it is to continue and develop, CTE will have to become more academically rigorous.
2.) Such reform would enhance opportunity for CTE students' further education and occupational training.
3.) Such reform would better complement current and emerging labor markets.

These goals and claims address longstanding concerns about vocational education and are in line with reforms sparked by the Perkins Act and other legislation from the last two decades. And they are clearly in line with the spirit of multiple pathways reforms.

The research literature addressing whether CTE is meeting these goals ranges from meta-analyses of the effects of vocational education, to detailed articulations of standards and outcomes, to case studies of successful programs. The overall picture is a mixed one. For example, several studies of theme-based schools and career academies have documented some successes in increasing opportunities for further education and employment (Maxwell & Rubin, 2000, Stern et al, 1992). Yet one large study—the National Assessment of Vocational Education—recently concluded that little progress has been made toward the goal of using high school CTE to improve academic achievement (Silverberg et al, 2004). I'm struck, though, by several themes and perspectives that I don't find in this literature – or find thinly treated – and I think that they might benefit both attempts to reform Career and Technical Education and the creation of robust multiple pathways. In essence, I find a tendency to undervalue the intellectual content of work and a reluctance to critically engage the academic-vocational distinction itself.

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First, a few words on the background to these comments. They emerge from a research project that explored the cognition involved in blue-collar and service work, published as The Mind at Work (Rose, 2004). I had several goals in doing the study: To portray the cognitive content of everyday work; to challenge the easy cultural distinctions we make between "hand work" and "brain work"; to broaden our discussion of intelligence; and to consider these issues of work and intelligence within the frameworks of educational policy and democratic theory.

The occupations I studied included waitressing, hairstying, three construction trades (carpentry, plumbing, electrical), welding, and factory work. I observed people at work, interviewed them, recorded examples of their work for analysis by other competent practitioners and by scholars in cognitive psychology and education, and read social and technical histories of their occupations. In most cases, I was able to study both experts and novices, and, therefore, some of the study took me into high school, community college, and workplace educational and training programs. It is this aspect of the study that is most pertinent to our discussion.

One more prefatory note. The kinds of work I studied would be classified in our current lexicon as "old economy" work, not the kind of work featured in the CTE reform or in most of the multiple pathways literature. But I think that if one finds rich cognitive content in old economy work, then new economy work—work that is putatively more cognitively demanding—should display such content as well.

Now, let me present the additional or alternative perspective that I would like to see in the CTE policy literature.

An Alternative Perspective on Career and Technical Education

The cognitive content

The focus of the CTE literature tends to be on what an infusion of traditional academic content can bring to vocational education rather than a focus on the actual or

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potential cognitive content of vocational education and the work from which it draws. The unintended effect is a depiction of CTE as cognitively inferior not only in its practice (which, sadly, it can be) but in its essence, as well. This depiction inflames long standing subject area battles between CTE and academic folk – which spells trouble for reform – but also reinscribes cultural biases and simplifications about manual versus mental activity, blue-collar work versus white, hand versus brain.

As someone who was once tracked into a vocational curriculum and who has taught in a number of remedial and preparatory programs, I applaud attempts to bring a liberal course of study more fully into CTE. But it would also be helpful to see an argument in the reform literature that turns the epistemological tables, that calls for the intellectual enrichment of CTE by articulating the substantial cognitive potential of the world of work – as Dewey and Whitehead did long ago – and, for that fact, complicates the distinction between "academic" and "vocational", as some experimental programs and schools do today (see, e.g., Rosenstock, 1991).

As a starting point, let me list some of the skills and abilities that good CTE can foster:

- Develop acuity in perception and observation
- Develop ability to attend and remember
- Knowledge of tools, their capabilities and limitations
- Skills in planning and prioritizing tasks
- Increased ability to solve both routine and non-routine problems
- Development of analytical reasoning skills
- The ability to use and communicate with a variety of symbols, including mathematical symbols
- Increased skills in applying mathematics to support planning, trouble-shooting, and problem-solving
- Use of writing to aid learning and task completion

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- Increasing ability to use a variety of reading strategies and to select the appropriate strategy for the task at hand
- Enhanced communication and interactional ability, including ability to learn from teachers, students, and from co-workers on the job
- Skills in reflecting on one's own actions and modifying them to improve task performance and avoid injury or error
- Development of aesthetic and craft values
- Increased motivation to learn and work

How does the best CTE help students develop these important skills and abilities, ones that would be integral to many multiple pathways approaches and that could form a base for further education and/or for employment? My research identified some key features of CTE that seem to foster these goals:

<u>Key features of good CTE classrooms and programs</u>

1. Many of the tasks students do are authentic, real-world tasks with consequences: building a display cabinet on commission; repairing the plumbing in a women's shelter; contributing time to a Habitat for Humanity construction site; mastering various welding tools, processes, and materials; learning the chemistry of hair-coloring with the goal of applying it under supervision.

2. These tasks are rich in opportunities to develop knowledge of tools, processes, and materials and to engage in problem-solving, decision-making, abstracting, discussing what one is doing/has done, reflecting on practice, etc. The best teachers enhance and foreground such cognitive work through the way they present tasks, ask questions, and supervise student activities. I think of two teachers in particular, a plumber and a carpenter, who were Socratic in approach: asking students what to do next and why and having them think ahead to the consequences of their actions. They would also do things to get students to entertain other perspectives, to see things in a new light—like the carpentry teacher who would occasion the flash of insight into

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structure by walking students to other parts of a house frame to give them a different take on the effects of their work.

3. Traditional academic pursuits (mathematics, reading and writing, science) are embedded in these tasks. The best teachers point out that students are, in fact, doing math, science, etc. and make connections to their academic classes. Such connecting happens most readily in career academies or integrated programs where teachers are able to plan such integration. For example, in a Graphic Arts Academy that I observed, students study in chemistry the structure and qualities of the ink they're using in the graphic arts lab, and the teachers of the two classes refer back and forth to chemical properties and to application.

4. The assessment of student performance is "authentic" as well, deriving from the teacher's or supervisor's judgment of the quality of a student's work. But the tasks themselves also provide an occasion for assessment, self-assessment particularly. If the print on an announcement is blurry, or a weld is uneven, or a light bulb doesn't go on – these provide clear evidence to teacher and student alike that something went wrong. The powerful thing about such an event is that it also provides the occasion for further learning: for retracing one's steps, troubleshooting, reflecting on performance.

5. The environments in which students learn are real-world work environments (e.g., a hair salon) or, in some way, simulate them.

The best of the real-world environments are modified, however, by the presence of supervision and some explicitly pedagogical interaction. So expert professionals determine what tasks the students do, in what order, provide guidance, pose questions, and guide performance.

The simulations range from various kinds of models (e.g., a 12 foot by 12 foot house frame on which students practice electrical wiring) to large classrooms

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equipped with many of the tools and machines that one would find in an actual print, carpentry, or welding shop.

I'm describing physical environments, but in the best of these places there is much more to it, a "symbolic" or "cultural" environment of traditions, values, and attitudes toward the work, as well. This dimension of the environment is created on several levels. a.) By the way the instructional/work space is organized and by the objects in it (e.g., the embodiment of tradition in the cabinet full of old woodworking tools, the awl, the spokeshave). b.) By the values expressed by the teacher and the mode of practice he or she presents. ("A bridge is only as strong as its weakest weld," a welding instructor tells her community college students. "You're like a surgeon, but you're working on metal. You're taking two separate entities and making them one. So take it to heart.") c.) By the traditions and experiences that some students bring from families of craftspersons, health care workers, cooks, or hairstylists. (CTE spaces are hospitable to these traditions.) d.) By the reaction of people who are on the receiving end of the students' work. (I was struck by how moved a student was when he saw a cabinet he had built being used in his school's office.) One can find evidence of this symbolic dimension in the things students say (one boy spoke of the "integrity" of working with wood) and equally in what they do – e.g., a student who rewired a perfectly functional fixture because he thought his earlier work was "ugly."

6. The foregoing suggests another characteristic of the good CTE classroom/workspace. Blended with the cognitive and the technical are craft values, ethical concerns, and aesthetics. These values and concerns are beneficial both at the level of individual development and of the social good. It is also worth pointing out that – as evidenced in the young man rewiring a fixture because he found it ugly – ethical and aesthetic concerns can guide performance (and thus achievement) in these settings, and are sometimes hard to separate out from more strictly cognitive motivators and outcomes.

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7. Clearly all of the above point to the importance of the teacher/supervisor. Though I saw a range of personalities and teaching styles, the good teachers share some predictable characteristics. They are knowledgeable practitioners of their occupations, and this knowledge is a source of respect – students know that their teachers speak from experience. These teachers seem committed to student development, both in terms of occupational skills and in more general cognitive and social domains. And whether they learn it through a teacher education program or from work experience, they have good pedagogical sense. They move around the room, continually checking in on students and/or being summoned by them. They shift strategically from explaining, to demonstrating, to asking questions. They give students room to try things out and blunder but know when to intervene and guide. They sometimes offer personal and career counseling. They want to develop competent carpenters, or welders, or hairstylists, but I think it's fair to say that they hold other cognitive and social goals for their students as well.

Implications of the Alternative Perspective on CTE

It would be generative to lay a list of the above CTE competencies (e.g., development of ability to attend and remember, skills in planning and prioritizing tasks, increased ability to solve both routine and non-routine problems) alongside a typical list of academic competencies and note the points of convergence and difference – and then to try to imagine how the two lists could fuse, what conditions could spark a new synthesis. Many of these CTE competencies are similar or identical to the broad skills some experts predict are essential to obtain secure jobs in the future (e.g., Levy & Murnane, 2004).

This kind of inquiry about academic and vocational competencies also might help us open up what I see as a conceptual and methodological problem with the typical way that the impact of CTE on academic achievement is studied. On the whole, these studies find that CTE has little effect on educational outcomes. Of course, there is the possibility that particular programs do show significant – and revealing – effects, but get washed out

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in the aggregate. But there is also the issue of how academic achievement is defined and operationalized – e.g., as academic courses taken, as grades in such courses, or as performance on academic achievement tests. As I hope the above lists suggest, there can be important cognitive effects of CTE that perhaps don't get reflected in measures like academic grade point average. Furthermore, it is commonplace in such studies to distinguish between "academic" and "non-academic" or "non-school" kinds of thinking. But again, the above lists suggest such distinctions are problematic; many of the items listed certainly have academic value.

There are issues raised here that touch on significant debates within educational psychology and cognitive science: debates about the transfer of training from one domain to another and about the generic or situated nature of knowledge and cognitive strategies. This paper is not the place to repeat these long-standing and complex debates, but I do want to draw one thing from them that is pertinent here. It is typical in policy discussions to define school or formal knowledge as abstract, generic, and transferable—e.g., that principles learned in chemistry can be applied by a student in a range of domains, to a range of problems. In contrast, knowledge acquired in vocational or applied courses or the informal knowledge acquired in a work setting is defined as local, specific to the task at hand, not transferable to a range of problems—e.g., the student who learns how a carburetor is built and how to repair it is not necessarily able to apply the principles about combustion embedded in the task to other domains.

There is no doubt about the value of learning principles rather than just specific routines, but the dichotomy, as typically represented, misleads. The learning of specific skills and routines is sometimes integrally related to the learning of principles—in the laboratory or autoshop. And there are the key issues of how a subject is taught, the context in which it is taught, the materials used, and so on. Chemistry, as Dewey observed long ago, can be taught in a way that has no transfer or relevance beyond the classroom, and an occupation can give rise to rich and powerful knowledge. In the policy deliberations about CTE that are sure to come over the next few years, thinking and learning need to be defined in less dichotomous, more nuanced ways.

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There is a second implication of the alternative perspective I offer on Career and Technical Education.

Though the CTE reform literature occasionally refers to the civic, moral, and developmental dimensions of education, the focus is primarily economic – the economic benefits to both student and society. (And a fair amount of the multiple pathways literature has a tendency to do the same.) Such focus is not necessarily a bad thing; the economic motive has long driven mass education in the United States. The issue, I believe, is how narrowly or richly "vocation" is conceived and whether the student is defined solely as an economic being. Discussions of CTE need to be located in a comprehensive philosophy of education, one that articulates the value of personal development and intellectual growth, of the social contract and civic awareness, of the ethical and aesthetic dimension of schooling.

Barriers to Achieving the Goals of CTE

What keeps us from moving in this direction? There are several reasons, the first two of which are familiar—and daunting—topics in the CTE reform literature (e.g., Grubb, 1995).

There is the weight of tradition: The way vocational education was defined when the originating Smith-Hughes Act was passed in 1917. With this definition came the structural and curricular separation of the vocational and the academic. More recent legislation like the amendments to the Perkins Act in 1990 (Perkins II) and 1998 (Perkins III) have sought to alter this definition and separation, with various degrees of success. A further widely-discussed issue is teacher education and development. The typical education of either academic or vocational teachers does not prepare them to think across subject-matter divides. And Perkins-inspired attempts at curriculum integration reveal how hard it is to effect within school structure a substantial blending of the vocational and the academic courses of study.

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Two further barriers to comprehensive CTE reform are less discussed, though I think they are important concerns.

Our discussion of "vocation" and "career" tends toward the socially and philosophically narrow—as I suggested earlier—especially where CTE students are concerned. Though there certainly are cultural traditions and educational literatures that define "vocation" and "career" in rich ways, these traditions and literatures tend toward higher status professions, from managers, to physicians, to clerics. As we slide down the occupational ladder, our discussion of education for those careers tends evermore toward the functional, task-specific, and philosophically one-dimensional. As one policy analyst I interviewed put it, ideas for vocational education programs tend to "get implemented in the lowest, least imaginative form possible."

Then there are the perceived characteristics of CTE students themselves. Since the early days of vocational education, VocEd students have typically been characterized as not being on a cognitive par with their academic peers. They are "hand minded", for example, verses the "abstract minded" who take an academic curriculum. This distinction reflects cultural biases and, unfortunately, such bias still infects policy discussion today.

Now, it is true that a number of CTE-type students do have mediocre educations. Some are considerably unprepared, and their underpreperation 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 by the students themselves, by their many indications that they just don't like school – and don't trust it, either. The challenge here – for policy makers and teachers alike– is to be clearheaded in separating out a student's poor performance or detachment and defensiveness from intellectual possibility.

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We must not assume – as many curriculum developers seem to – that poor academic preparation forgoes sustained and serious involvement with core disciplinary topics and with material of intellectual consequence. The attempt to foster such involvement on a program level is one of the laudable features of multiple pathways reform. But by and large, our schools have responded to students' limited educational backgrounds with reductive, trivial curricula, "skills and drills", revealing once again assumptions about the cognitive capacity of those students on the CTE side of the vocational-academic divide.

Toward a New Conversation about CTE, Education, and the Workforce

The CTE policy literature understandably focuses on the immediate educational circumstances of the CTE student: curriculum, pathways to further education, occupational opportunities. Just so. But I've come to believe that the vocational-academic divide—and thus the efforts to create multiple pathways through it—could become the site of a broadly significant conversation, one that would not only affect CTE and programs of multiple pathways, but extend beyond them to some of 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 for its manifestation in the everyday. There is the set of cultural assumptions that attribute low intelligence to entire categories of work and to the people who do the 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 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

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difference in pretty simplistic ways. We develop limited categories for courses and for placement, which are administratively efficient but cognitively reductive – and we quickly rank-order them. Given, for example, the distinctions we make between the academic and the vocational, difference quickly devolves to deficiency. My sense is that, with a few exceptions, most policy and curricular deliberations about CTE have somewhere within them assumptions of cognitive limitation – and these assumptions shrink our curricular imagination. And this is a concern, I think, that multiple pathways reformers need to keep ever in mind. To vitalize our imagination, we need to rethink our notions about mind and work, but also need to reassess long-standing and seemingly self-evident distinctions among 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 as in the culture at large, to view the knowledge and skill associated with non-professional work as rudimentary.

A related issue is that the traditional, and weighty, separations between "pure" and "applied" knowledge, between "concept" and "skill," between the "theoretical" and "practical" tend to neatly segment a more elaborate reality. These distinctions harden in debates over the purpose of education or in disciplinary and professional power plays, but they blur and morph 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 further issues: meaning and identity, tradition and ethics, values, human connection. The school has not done a very good job of addressing them; when they do appear in conventional courses, the treatment is frequently abstract or trivial. Yet there are so many moments in the practice of challenging work where values, ethical questions, connections of self to 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, politics. The early architects of VocEd 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 the stage where they're realizing how important work will be in their lives,

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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 desire creates the conditions for a meaningful social education.

Conclusion

It is difficult to teach creatively in the intersection of the academic and the vocational. It involves the delicate negotiation of turf and subject-area status, which sparks teachers' suspicions and self-protection—the touchy personnel dimension of the academic-vocational split. Then there is the bureaucratic dimension: the finessing of work rules, curriculum frameworks, and district guidelines. And there is the crossing of disciplinary boundaries and culturally-sanctioned domains of knowledge, something that the typical undergraduate curriculum and teacher education program does not prepare one to do. Thus even the most willing of teachers is hampered by traditional vocabularies and definitions and status dynamics that make it so hard, for example, to articulate – and then to teach – the cognitive and aesthetic dimensions of manual skill.

It *is* difficult. It means developing classroom activities that authentically represent the knowledge and intellectual demands of the workplace and, conversely, bringing academic content to life through occupational tasks and simulations. It means that the house or the automobile could be the core of a rich, integrated curriculum: one that includes social and technical history, science and economics, and hands-on assembly and repair. It means learning about new subject areas, and making unfamiliar connections: the historian investigating the health care or travel industry, or the machinist engaging the humanities. It means fostering not only basic mathematical skill, but also an appreciation of mathematics, a mathematical sensibility, through the particulars of the print shop, the restaurant, the hospital lab. It means, as well, seeking out the many literate possibilities running through young people's lives—on the street, in church, in romance—and connecting them to the language of the stage, the poem, but the tech manual, too, and the contract, and The Bill of Rights. And, of course, such teaching

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might well mean providing instruction in "basic skills", but in a manner that puts the skill in context, considers its purpose, pushes toward meaning beyond rote performance.

The teachers who do this work are trying to fashion a quality education for a larger number than usual of American youngsters. From what I've seen, they increase the number of students who graduate thoughtful and articulate, able to talk about what they're learning and of themselves as learners, able to act in and on the world. "It's the most powerful thing", says one teacher, "that I've ever done in education." While these educational experiments can involve all children, I am impressed by the special meaning they have for students who are not on the educational fast-track, the great mass of young humanity. This kind of teaching represents a significant change in established beliefs about the capacity of such students. The typical language in policy documents used to describe these young people is a language of practicality and preparation, inflected with a sense of their limitation. There is little sense of promise, of the excitement 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. It is noteworthy, in this regard, 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 everyone—absent brain damage—is capable of understanding the conceptual fundamentals of algebra. "How can a culture be created," writes Moses and his colleagues, "in…which every child is expected to be as good as possible in his or her mathematical development?"

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

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common person and connecting education to an egalitarian vision of human and cultural development. There was John Dewey and Jane Addams, but others as well, academics and state-level committee members. But that view of mass education was erased from final policy. It needs to be reclaimed, for it is so pertinent now. This reclaimation could end up being a defining and potent feature of multiple pathways reforms.

Without such bedrock beliefs and commitments, we will never comprehensively revitalize Career and Technical Education, or bridge the academic-vocational divide, or create a diversity of fresh and engaging courses of study that provide substantial pathways through and beyond high school. We will continue to take good ideas and squander them, dumb them down, trivialize them, 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. Thus it is that those teachers who do work diligently at the breach between the academic and the vocational are engaged in a kind of applied political philosophy. They challenge the culture's assumptions about hand and brain, and the rigid system of educational theory and method that emerged from them, making the schoolhouse more truly democratic by honoring the fundamental intelligence of a broad range of human activity.

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