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Is Water an Input to a Fish? Problems with the Production-Function Model in Education

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Abstract:

The concept of a production-function as a metaphor of the educational process is critiqued. In particular, Monk's (1992) discussion of the production-function is seen as typical of the final stages of a dying paradigm.

When reading David Monk's discussion of the production-function in education one is reminded of the behavior Thomas Kuhn describes as typical of the end-stages of a paradigm that is about to be replaced (Monk, 1992). The nature of Monk's efforts to recuperate this model in the face of the failings he himself points up leads me to wonder if a crisis of the kind that has been described in the history of every branch of thought might not be waiting in the wings for economics, at least as it is exemplified by the writing of production-functionalists.

Monk begins by calling into question the fairness of using outcome-based approaches as a means of increasing educational productivity. He suggests that given our ignorance of precisely what factors contribute dependably to deepening the effect of schools, such an "outcomes-as-standards" approach constitutes an unfair abrogation of responsibility on the part of central administration. It allows, indeed encourages, it to merely sit back and hand out judgements, rewards, and penalties for school outcomes without acknowledging its own proper role in helping school-based agents to achieve success (Ferris, 1992).

Monk offers two main explanations for the inability of research to discover reliable production-functions in education: data collected on an aggregate level that fails to capture important classroom-level effects; and the lack of attention by researchers to the complex nature of school processes which differ from conventional production and hence require a more sophisticated modeling of the production-function. After briefly reviewing some inductive,

experimental-design, and process studies he returns in earnest to a critique of the "outcomes-as-standards policy response" which he sees as an outgrowth of the frustration with the production-function approach to yield useful results. Monk distinguishes between two versions of the outcomes-as-standards strategy:

"Version 1 is consistent with an underlying belief that there is no such thing as a tractable production-function. If there is no such thing as a tractable production-function, each schooling situation is highly idiosyncratic. It follows that there is no role for centralized authority in the improvement of productivity aside from the setting of targets, the dissemination of ideas that might be tried by teachers, and perhaps efforts to make it easier for teachers to try ideas out. According to this view there is nothing to be learned from another's experience, since there is nothing systematic or regular about education production.... Teacher autonomy is the central commitment of this version of the strategy. The teacher is the only person who can make sense of the instructional reality. No second-guessing from more centralized sources or even from other teachers is desirable. The key point is that there is nothing to learn from anyone else's experience. It is every teacher for him- or herself, and the race goes to the swift. In sharp contrast, A Version 2 approach retains faith in the reality of a tractable production-function and sees the outcomes-as-standards strategy as a new means of gaining insight into the function's properties. What this requires is guided experimentation (both personal and otherwise) and aggressive dissemination efforts regarding these experiences, including unsuccessful ones. In contrast to Version 1, there is a prominent role to be played by central authorities, and it goes far beyond simply setting targets, monitoring compliance, and acting as judge and jury" (Monk, 1992 pp. 316).

I quote this passage at such length because I am struck by its tone of petulance and absolutism. The inconsistencies, the limitations and distortions embodied in this view of the classroom, of 'authority', and (I must take him at his word here) production-function fully inform his subsequent analysis. By addressing them specifically I hope to cast some light on this Weltanschauung, a view that betrays the unsuitability of the production-function model. This unsuitability, it seems to me, derives directly from the paradigm, not from a lack of refinement, skill, or sophistication in its application but from its very heart and nature.

In Version 1, Monk deduces from the lack of a tractable production-function a highly idiosyncratic schooling environment. While few would disagree with this conclusion, it does not necessarily follow that such idiosyncrasy is either a drawback or identical with literal uniqueness and the entropic random quality that Monk invokes when he claims that, "there is nothing to be learned from another's experience, since there is nothing systematic or regular about education production." Perhaps this leap-taking, from difference and unpredictability to arbitrary and malignant disorder, necessarily follows from the definition of production-function: where it is not, chaos must be. If so, it is clear that such a view has little relationship to the experience of classroom teachers or administrators. The fact that classroom outcomes are not completely reducible to systemization or regularization is not at all to say that there is "nothing systematic or regular about education production." Nor would someone who has spent much time working in schools assert that "there is nothing to learn from anyone else's experience." Because I am unable to reliably start my car with a hammer does not mean that the car can not be started. Similarly, the fact that I am unable to start your car with my key does not mean that the cars have nothing in common, or that I have nothing to learn from watching you start yours.

Monk readily acknowledges that the hammer of production-function has failed to start the car of education, but the choice with which he presents us is to either build a different, better hammer or give up on any assurance of ever starting cars reliably at all. Apparently it never

occurs to him that the battered condition of the vehicle might be due at least in part to the energetic and repeated applications of this inappropriate tool. Perhaps this is rooted in his belief that, absent a tractable production-function, "there is no role for 'centralized authority' in the improvement of productivity aside from the setting of targets, the dissemination of ideas that might be tried by teachers, and perhaps efforts to make it easier for teachers to try ideas out" (emphasis added). What exactly is the problem here? Unless control for its own sake is the goal, this would seem a perfectly reasonable role for central actors. Indeed two paragraphs later, when laying out the more-favored Version 2 one reads that "What this requires is guided experimentation (both personal and otherwise) and aggressive dissemination efforts regarding these experiences, including unsuccessful ones." How this differs from the decadent Version 1 scenario is left to the reader's imagination, as is the manner in which "in contrast to Version 1, there is a prominent role to be played by central authorities, and it goes far beyond simply setting targets, monitoring compliance, and acting as judge and jury"

At times in this thesis, as here, preserving central "authority" seems to have canonical virtue; at other times merely an expedient value, as in the following passage: "As was pointed out above, if there is no production function there is a much diminished administrative role in efforts to improve productivity. The practical reality is that we are already committed to retaining an administrative role. Given this orientation a case can be made for doing all that is possible to make it bear fruit before abandoning it" (ibid, pp. 319). Substituting "heliocentrism" or "flat-earth model" for "administrative role" in this passage illustrates its nonsensical quality, especially if one asks "Who makes bigger, more consequential mistakes, local or central actors?"

Something in Version 1 so distresses Monk that he seems incapable of remembering the very attributes he ascribes to it. Less than two pages after stating that Version 1 would logically allot to administrators only the role of "the dissemination of ideas that might be tried by teachers" (ibid, pp. 316) he claims that "since we are talking about Version 1 policies there is no guarantee that the insights gained will be disseminated" (ibid, pp. 317-318) The attachment to "central authority" pervades the paper, and while Monk clearly recognizes the limitations of aggregation when it comes to data collection and analysis (indeed he calls specifically for disaggregation in this process) he seems not to discover any drawbacks to the aggregation of implementation (Note 1). He tips his hand when, discussing the "ideal" scenario (Version 2 policies and a real production-function for education), he rhapsodizes "Once the production- function is known, the outcomes-as-standards approach can be abandoned, and a centralized authority can begin to dictate method" (ibid, pp. 319). Perhaps this is the crux of the matter, the very thing that drives Monk to continue the hunt even though he knows everyone who has gone before has failed: "...to the degree that we grant greater discretion to the teachers and give them freer reign in their classrooms, and to the degree that we conceive of good administration as simply getting out of the way of teachers, we will be pursuing policies at whose core is a fundamental denial of the production-function." (ibid, pp. 319)

In Monk's world we have to choose between (an implicitly dangerous) teacher autonomy and a production-function whose validity and usefulness is directly proportional to its opposition to or distance from the local, craft-based skills of teaching. The only role for teachers outlined in his more-favored scenarios is to implement policies determined by higher-ups (never mind that the costs, opportunity and otherwise, of a teacher or an entire school trying something new and failing at it are far less than those of a centrally-conceived and implemented failure). A production-function, should it ever be discovered, would therefore serve supervisors rather than instructors. It is a managers' tool, designed for management functions; it has nothing to do with teaching and learning but with the management of teaching and learning This hierarchical factory/industrial model of organization is something I had thought we were moving away from. Indeed, even as formulated by Monk, who tries to redeem the production-function model by incorporating a few clumsy classroom- and teacher-level effects into his model, the

production-function would seem to make objects of teachers rather than subjects. It follows in the long tradition of labor de-skilling and attempts to shoe-horn education into a managerial model that misses both the forest and the trees.

Learning is first and foremost a social activity, a messy, tumultuous human process with all the shocks that flesh is heir to. As such it is fantastically complex, multivariate, and in a real sense irreducible. Fish swim in water, but it also carries oxygen for them to breathe. It is where they mate and die and feed, and yet they move through it unawares as we do through time, as we do through the social world which is our ocean. Can a prominent place be made for this in a production-function model? If not it will become be a theoretician's bauble, condemned to perpetual misprision by its own irrelevance.

Monk repeats several times that if there is no production-function then any improvements will be arbitrary, the result of luck, non-cumulative and non-transferable. This is true only if you believe that the only genuine improvements are those that can be stamped out identically in infinite number. While he understands that researchers must get down to the classroom level in order to stalk the wild inputs he would have us gather that data, bring it back to the office, and there attempt to pluck out the heart of its mystery (its social component, its inchoate quantum component, its vanishing-ink component, its dying fish-out-of-water component), pulverize it, and spray it from the air in district crop-dusters.

The result of the application of the production-function methodology to education has been, I believe, to insulate and perpetuating the status quo of the education/policy bureaucracy. For as Monk makes abundantly clear central authority and production-function jockeys depend upon one another for survival, as each provides the other's *raison d'être*. Whether they benefit education is another matter entirely, one that Monk cannot finesse by setting up straw dogs to clumsily upset or by making courtier's pleas for expedience. He fails even to acknowledge, for instance, the divergent interests of school authorities and teachers, or of central and local school authorities that is well captured by Ferris (Ferris, 1992).

Finally, though, I suspect the real problem lies not with Monk's insistence on starting cars with hammers, as it were, but with the notions that undergird the concept of production-function itself. As I suggested in my writings about "dominant machine metaphors" people have for thousands of years labored to create iconic models of the world in order that they may move from a state of apprehension to one of comprehension. Art, religion, and articulated social structure are the most primitive and the most enduring products of this compulsion. Later as we became more dexterous we began to create machines and models that, while informed by our glimpses of the workings of the world, had for the first time sufficient complexity of their own that we could stand back and say "Look, the world--brain, god, society--is just like our machine--a clock, an engine, a computer." In other words, out of a tentative and fragmentary experience with the wide, wet world we construct a brittle and impoverished model capable of doing a few things with tolerable utility. We then in our hubris turn back to the world and say "You are like our machine."

Each age has a machine, a created thing that stamps its mark upon all that age's systemizations, however foolish or inappropriate. For the nineteenth century, which also saw the invention of the light bulb, the telephone, indoor plumbing and many other useful things, the overwhelming favorite was the engine and its organizational concomitant, the factory. For this reason, nearly every metaphor used widely during that time refers to inputs and outputs, drive, regulation, standardization, centralization of control and the like. The great nineteenth century novelists (including Freud and Marx and Darwin) were tethered to these machines and incorporated their terms of drives and forces into every aspect of their work. It is not being maintained here that because these systems are anachronistic they are necessarily wrong, but they are limited in several important aspects.

First, since they depend on an analogy to a system of mechanical linkages, they tend to do

poorly with systems that lack such direct connections, or where the connections are mitigated by extra-systemic factors. Second, since they are fundamentally about regulation they do not do well with systems that contain significant arbitrariness, randomness, or unquantifiable components, and are able to incorporate these terms only under the rubric of "waste" or "inefficiency". Third, and most important for our discussion here, they break down, lose confidence in themselves when confronted with what Keats called "negative capability" (Note 2). Throughout Monk's article he expresses distaste for a profusion of local experimental initiatives, even though there are no indications that all of these combined would cost more in any terms than even a single one of the large-scale, macro-level, policy-driven failures we've seen so often. The notion that there may be some inherent value in a locally-designed and implemented plan, even one that fails, seems never to enter his mind. No doubt the idiosyncrasy of classrooms has its good points as well as its bad ones, but it seems ludicrous to recast this more or less limited and benign variety as demonic unworkability simply because it makes life difficult for those who attempt to impose a production-function approach on the classroom. The fact that all classrooms are idiosyncratic does not make them unique (and hence unworkable from a policy point of view) unless you are attempting to cast idiosyncrasy as a *bête noir*. There is a fundamental difference between attempting to discover regularity in disparate situations and imagining that what you find and call "regularity" is necessarily transferable to other situations. Classrooms are more than just mirrors held up to policy analysts.

Lastly (and tentatively) I should like to suggest that the production-function model and its corollary, efficiency, as with much else in economics, are based on the quintessentially nineteenth century tenets of materiality, scarcity, and non-simultaneity of ownership. The production-function is a corollary of the principle of efficiency. It looks to discover a direct connection (but, as we've seen, not necessarily a sensible or desirable one) between what goes in and what comes out. (Note that the image is that of the supervisor tinkering with the regulator of the machine while making notes on his clipboard, Taylorism applied to schools as factories.) When you are dealing with material inputs and variables this makes some sense. But when, as experience seems to show, we need also to talk about non-material factors then criteria of efficiency, including production-function, makes much less sense. It is not simply that there are some inputs which are not subject to "scarcity", although this is true (Ferris, 1992). It is not, as Monk says, that we need to refine our models. It is that this entire model of productivity is based on tangible non-simultaneous possession of material goods. While this may have been a logical way to structure social thought and institutions one hundred years ago it hasn't aged very well. As we begin to reconceive the world in post- industrial terms the utility of those terms and concepts which require us to think in pre-postmodern syntax will be less and less apparent (Note 3).

It is not being claimed here that none of the terms currently employed make sense or that the new ones are a priori better at capturing the "truth" of the situation. However, as we begin to reconceive and re-embody the world around us according to a different paradigm (a long process but one that is clearly well underway), terms which had surplus value under the old system simply because they responded to our intuited understanding of the way the world works will have to work harder to earn their keep. Concepts like production-function (and, much more subtly and interestingly, efficiency) will no longer serve as first principles in a deductive framework. Rather they will once again become specific tools, useful in some situations, irrelevant in others.

NOTES

1. "First, despite the disappointments in the existing empirical research it is not possible to point to this research as a proof that the production function does not exist. It may simply be that analysts have not been looking in the right places for the regularities to emerge. We

have not yet discerned the pattern to the results of previous studies. Future work may reveal regularities that are real but thus far undetected" (ibid, pp. 319). This sounds like superfluity pleading for continued subsidy. It seems prudent to ask whether the preservation of central authority is worth the tremendous opportunity costs of continuing under a model that produces the most impoverished results imaginable, both for research and for schools.

2. "that is, when a man is capable of being in uncertainties, mysteries, doubts, without any irritable reaching after facts or certainties."
3. Information, not authority; networks and pointers, not linkages; inexpensive ubiquity, not dear scarcity; simultaneous possession, not mutually-exclusive ownership; instantaneity/time-shifting, not temporality; community of interests, not community of place; distributed horizontality not centralized verticality.

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