School Finance Redesign Project

center on reinventing public education

OUT OF THE BOX:

Fundamental Change in School Funding

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The School Finance Redesign Project

The School Finance Redesign Project (SFRP) encompasses research, policy analysis, and public engagement activities that examine how K-12 finance can be redesigned to better support student performance. The project addresses the basic question, "How can resources help schools achieve the higher levels of student performance that state and national education standards now demand?"

Check in with us periodically to see what we're learning and how that information may re-shape education finance to make money matter for America's schools. You can find us at www.schoolfinanceredesign.org.

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Introduction

I take this opportunity to explore several departures from conventional thinking about how states respond to their responsibility for educating the nation's youth. I focus primarily on the finance of K-12 educational systems, although I note the boundaries on K-12 systems are in flux with increasing attention being devoted to the infusion of multiple service delivery systems (e.g., health and social services) into the schools along with efforts to expand services based in conventional K-12 administrative structures to pre-school as well as older learners in P-16 systems. Nevertheless, it is the extant K-12 educational system that has immense scale along with a fiscal and administrative history that can inhibit thinking in new ways about how the structure is organized and financed. It is a worthy focus for this exercise.

While it is easy to observe discontent with current methods for financing and organizing schools, we have also become accustomed to the existing system, faults and all. Sizeable bureaucracies have developed at the local, state, and national levels to handle the administration of the system. These administrative structures have grown incrementally and have become quite adept at protecting themselves. The fact that the stakes are high, because we are talking about cultivating the minds of the next generation, adds to the gravitas surrounding the existing structures and their resistance to change.

I stress the significance of the defenses surrounding the existing structures to forewarn the reader that it is relatively easy to dismiss new ways of thinking because they introduce elements of the unknown and carry their own administrative burdens. It can be relatively easy to dismiss new ideas on these grounds, even new ideas that may have considerable merit. So, I begin with a request for readers to remain open to new approaches even though there remain many unanswered questions. Skepticism is important, but we need to guard against getting caught up too quickly in all the reasons why something new will not work.

I explore five reasonably distinct ideas that if taken seriously would have significant implications for how we organize and finance our schools. For each, I provide a sketch, anticipate some issues, and assess implications for school finance. I close with an effort to imagine what a system would look like if all five ideas were adopted simultaneously.

Differential Add-ons and Variable Pricing

Context

The central idea is to move away from the conventional all or nothing conception of the public school and introduce elements of differential user charges to the funding of public education. It is based on a school of thought within public finance that can be linked to the work of Knut Wicksell who wrote at the turn of the century (Musgrave and Peacock 1958). Wicksell takes issue with the common practice in public finance to divorce decisions about expenditure from decisions about revenue. We are accustomed to this sharp division, almost to the point where it is hard to imagine otherwise. Indeed, in school finance it is common to figure out the expenditure side of the budget first and then impose the necessary broad based taxes to raise the needed sums. Wicksell's insight was that significant gains can be made in satisfaction with the

public sector if the imposition of tax (i.e., cost) is brought more directly into line with the receipt of benefits.

We already do this to a degree thanks to our commitment to decentralized units of local government. As citizens we have some choice about the level and mix of services we receive and the attendant costs thanks to decisions we make about where to live (Tiebout 1956). But, Wicksell would push the practice further and open the door on differing levels and mixes of services within public governing units along with corresponding taxes or fees.

There are some existing and emerging mechanisms that promote this kind of agenda. For example, vouchers are designed to achieve better matches between parent and student preferences for education and in at least some versions allow for financial add-ons from the participants to cover the costs of extra services that are sought. Thus, voucher programs can be thought of as a mix of a common base level of support with differential add-ons that correspond to elected services. But vouchers tip heavily toward involving the private sector and thereby miss the public dimension that is such an important part of Wicksell's idea.

There are efforts within conventional public schools to promote choice, and there is an extensive history of entities like magnet schools that are organized around themes. While a case can be made in favor of the broadened range of choice afforded by magnet schools and other forms of public schools of choice, these efforts miss the central point of Wicksell's argument. Why? Because there is no corresponding adjustment on the revenue or tax side. Students typically enroll in magnet schools with no adjustment for whatever differences there might be in the cost of their program relative to others. In fact, prevailing practices with respect to public schools of choice fit with the Wicksell idea only to the degree that all of the options have the same cost, an unlikely result. Wicksell would worry about a possibly widening gap between the costs imposed and the benefits received as a consequence of school choice plans.

Charter schools constitute an interesting more mixed approach. If they are structured so that participants are able to supplement the base allocation to cover the costs of their preferences, a key part of Wicksell's idea is in place. However, if they are set up as separate entities so that the public oversight is minimal, they are functioning more like publicly subsidized private entities and thus miss an important dimension of what Wicksell has in mind: publicly operated endeavors with variable levels of add-on services and corresponding pricing. I shall use the term "hybrid services" to refer to these differentially priced add-on services that remain directly under the control of the public authority.

Operations

For Wicksell's idea to be viable, three pre-conditions need to be met. First, there needs to be a defensible way to link differences in program benefits to differences in cost; second, governance authorities need to differentiate between services that constitute a base program that needs to be available to all and extensions where it is appropriate to impose restrictions on access; and third, there needs to be a collective resolve to administer the program and enforce the rules.

Links between programs and costs. Consider the case of an instrumental music program in an elementary school. Current practice provides the program, if at all, uniformly and typically at a low level. The costs are imposed on all taxpayers and the program is vulnerable to budget cutting pressures because of its uncertain place in the school's mission. Supporters of the

program are in the awkward position of trying to persuade others, including taxpayers with no children in the school, to support an endeavor whose benefits are arguably far removed.

An alternative approach would entail conducting a cost analysis of the program and making participation conditional upon a willingness to bear a portion of the estimated cost as a surcharge of some kind on the tax bill. Those parents seeing the value of the program could elect to participate. It would be a program operating in public space and would thereby set an example and perhaps inspire others to participate. Parents would elect to have their children participate or not based on their judgment about the match between cost and benefits. The district would be responsible for conducting the cost analysis and establishing the surcharge; the parents would make judgments about whether the anticipated and perceived benefits are worth the additional cost.

Defining the base program. Local authorities, presumably elected school boards, would need to draw lines among (a) what counts as the base program which will be available to all; (b) add-on programs delivered by the board, which will be available for an extra fee, which could be subsidized; and (c) other programs that are considered beyond the purview of the public school. School boards are accustomed to drawing just one line (between what is within and outside the purview of the board); here the board is expected to draw two lines. Continuing with the instrumental music program, the board needs to assign this to one of the three categories: (a) part of the base and available to all, (b) part of the school offering but available on a fee-for-service basis, or (c) not part of the school and only available, if at all, through the private sector.

The definition of the base program will go beyond a simple listing of discrete programs that are in and out of the three categories. In particular, important decisions need to be made about the quality of programs, and these decisions will also be made by public authorities at both the local and state levels. A local board might decide, for example, to offer a high quality academic program to all students in the school. Alternatively, the board might decide to define a lower level as the base and offer an enrichment program as something parents and students could enroll in on a fee-for-service basis. In keeping with existing governance structures, these local decisions will not be made in a vacuum since the state will continue to provide oversight.

Enforcement. The addition of public school services that are available only on a fee-for-service basis adds a new enforcement challenge as students will be denied access unless an additional payment has been made. A new boundary exists that will need to be respected in order for the system to work. Consider the case of a group of parents who value the benefits of sending their children to a small elementary school that the school board feels is too costly to justify including in the base program. With the new system in place, the parents could agree to cover the extra costs among themselves and thereby improve their satisfaction with the school district without making anyone else overtly worse off.[1] However, given the place bound nature of schools, we can imagine age-eligible children living in the neighborhood of the school who will not be welcome in the school because of their parents' unwillingness (or inability) to pay the extra fee. Thus, there is the unpleasant prospective image of students being denied entry to their neighborhood school for economic reasons. However, for the system to work, these students and their parents will need to accept going to a more distant school. Notice that in the absence of the

[1] However, if affluent parents use the new system to enhance opportunities for their children, the children of the less affluent could be worse off in a relative sense.

new system the small school would not be available in any case because the board decided it could not justify imposing the extra costs on all taxpayers in the district.

Implications for Equity, Efficiency, and Freedom of Choice

The most obvious gains of the new system accrue in the freedom of choice category. Under reasonable assumptions, the new system broadens choice and achieves a better match between preferences and options.

On the efficiency side, there may also be gains, both in terms of exchange and production efficiency. The exchange gains derive from the better match between preferences of the voters and the mix and level of services being delivered. The production efficiency gains are less obvious but may accrue thanks to the elements of market discipline that the new system introduces to the public sector. For example, in the case of the small school offering, the only reason parents will be willing to pay the extra tariff is because the school delivers on whatever advantages the parents believe are attached to the school's small scale. If the school fails to deliver, the parents are free to vote with their feet and the school will be forced to shape up or close for want of students.

The discipline of the market becomes a feature for any of the hybrid services that are offered. If parents can obtain a more cost-effective option elsewhere (in the private sector, for example), they will have the option of withdrawing their participation. The exit option will introduce a desirable pressure on school personnel to deliver effective hybrid services and to get the pricing right. There is an appealing self-regulating dimension to the new system.

The most obvious area for worry is in the equity or fairness category. I touched on this earlier when I made glancing reference to the fact that the parents of a student living near the small school might be unable to pay the extra cost of attending the small neighborhood school. How can it be desirable to tantalize students with publicly provided hybrid services that they are barred from receiving because of cost? Of course, we do this all the time given the decentralized and highly unequal way in which we currently fund public schools, but here the denials are a bit more "in your face" given that it all happens in the home school and district.

We can draw upon some well-established principles in public finance that can also be found in educational finance to address the difficulty. For example, guaranteed tax base programs tie spending levels with tax burdens but adjust the magnitude of the burdens so that they are more equal. Similar adjustments could be built into the pricing mechanism so that families with less ability to pay for services would face more modest, but presumably not zero, costs. In principle, equity could be preserved through the use of differential pricing for the elective services.

Critique

Benefit standard limitations, free-riders, and jointness in production problems. Wicksell's ideas have been a part of the public finance literature for many years and are generally viewed as interesting but largely impractical given the complexities and realities of the modern public sector. Much of the difficulty stems from the limited applicability of the benefit standard as the basis for apportioning tax burdens. The idea that tax burdens should be linked with benefits is fine as far as it goes. The difficulty is that it does not go very far in terms of the kinds of services provided by the public sector. Indeed, an important (but not the only) reason for

the public sector is the existence of important services for which the benefit standard is ill suited. The private sector is most comfortable with the benefit standard and it is folly to act as if the benefit standard is available to handle matters in the public sector when the public sector exists, in part, to deliver the kinds of services that do not lend themselves to the neat accounting presupposed by the benefit standard.

There are free rider problems to consider as well, but within educational contexts these seem less serious since well-established exclusionary devices are available. For example, we commonly use tuition as an exclusionary device for schools. Inefficiencies can also enter due to the joint nature of production. In education, the fact that one student benefits from a teacher does not in itself impede another student from benefiting simultaneously from the same teacher resource. If we buy this assertion, the presence of empty seats in classrooms can be viewed as inefficiencies since more students could benefit costlessly. However, we tolerate this kind of inefficiency routinely (witness the empty seats in theaters presenting popular productions) and are part of the existing educational system.

Cost estimation problems. Significant challenges surround serious efforts to estimate the costs of "add-on" programs in part because it can be so difficult to disentangle the add-on portion from the base portion. Moreover, there is a dynamic dimension that adds complexity. Returning to the small school example, the costs of operating the small school will vary depending on its size, and efforts to be responsive to parent enrollment desires could generate fluctuating enrollments, which will make it difficult to estimate costs. Moreover, what happens if the school is very popular and attracts more and more students so that it no longer offers the advantages of being small? Parents seeking the benefits of a small school will then have an incentive to withdraw their children and perhaps make efforts to start a new small school, again adding to the complexity of the cost analysis.

While there is no denying how complex the cost analysis could become, it is important to keep in mind that precision is not necessary for the new system to operate. First approximations of the costs will be much easier to generate and may be quite sufficient, particularly if periodic adjustments can be made over time as we gain experience. Education finance is no stranger to reliance on first approximations, and one of the best examples is the use of transaction samples as the basis of equalization rates in the administration of the real property tax.

Definition of the base program problems. It is easy to assert that the state will retain oversight regarding local authorities' decisions about how to define the base program, but how in practice would this work? Moreover, on what basis would the state intervene and second guess a decision by one local authority to impose fees for, say, instrumental music lessons while another builds an instrumental program into the base offering? If the state is going to opine on how the lines should be drawn between the three categories implicit in the new system, why go through the charade of having the local authorities make the initial decisions? The new system, despite its pro-local choice garb, may actually be sowing the seeds for a far greater state role in calling the shots with respect to the public's responsibility for educating the next generation—a remarkably ironic turn of events.

In response, why not think of the state's job as defining a minimalist base program and thereby open the door for local authorities to build-in enhancements that would enjoy partial public support. A key fiscal question for the state is whether it is willing to help fund the hybrid

offerings as determined by the local authority. We might think of the state as having a responsibility for lowering the surcharges to individuals with lesser ability to pay.

Logistical problems. If the surcharges take the form of increases in real property tax rates in order to take advantage of the existing link between the real property tax and the ability to pay of taxpayers as measured by their holdings of real property, numerous thorny logistical problems surface. For example, how would such a surcharge be imposed on renters or on taxpayers living in subsidized public housing?

It is better to think of the surcharge as something separate from the property tax rate. Each taxpayer would be categorized in terms of the number (and perhaps level) of supplemental services that were elected. Each service level would have a per-pupil cost attached to it and the taxpayer would receive an invoice for the hybrid services. The charge could be adjusted according to some independently determined ability to pay, perhaps along the lines of how free and reduced price lunch costs are determined. Again, these amounts need not be precisely determined. Reasonably accurate first approximations should be sufficient to launch and sustain the hybrid programs.

An Additional Observation

The reform envisioned here has the potential to be quite far-reaching with effects that are difficult to predict. On the one hand, by infusing differential add-ons and variable pricing into the institution of the public school, we could significantly strengthen public education by achieving an unprecedented good match between the citizenry's will to provide resources and the extent and nature of schooling services available to all. Senior citizens, for example, might rally to the cause of the public school because it would become possible for their taxes to be tied more directly to the kinds of essential education services they have interest in supporting in contrast to add-ons whose benefits are more narrowly circumscribed. School boards might rise to the occasion and make good and principled decisions about what to offer within the base program and what hybrid services to offer.

On the other hand, the market forces unleashed by a reform like this could undermine the very idea of the public school by making it possible for the affluent to drive down the base program to dysfunctional levels. Moreover, the states could bobble the ball badly in terms of their responsibility for tying surcharges to ability to pay and thereby further erode the equity of the system.

This combination of the uncertain and far-reaching nature of the results can undermine the case for implementing a reform like this, particularly if the reform has an all-or-nothing, no-going-back character. If the existing system were functioning well, it would be even harder to justify moving into uncertain waters like these. But the status quo has serious deficiencies, and, as I will suggest in the final section, it is both possible and desirable to take modest steps in the direction of implementing differential add-ons and variable pricing that include careful assessments of impact.

Technology and Input Substitution

Context

Technology initiatives are widespread these days within education and are being fueled simultaneously by remarkable technological advances (both in terms of telecommunications and computing), non-trivial profit making opportunities for vendors, and the promise of significant short- as well as long-term performance gains for students. Legislatures and governors are eager to embrace success stories like these that combine the glamour of technology, quick results, and photo opportunities that play well in the media.

Modern initiatives, many of which involve putting laptop computers into the hands of students and teachers, seem at least nominally aware of the importance of professional development and careful thinking about the proper role of technology in instruction, but it is still easier to buy equipment, deliver it to schools, and hope for the best than to work through the design of the deep kinds of reforms technology is making possible. The history of technological innovations in the schools is replete with story after story of equipment arriving that fits poorly and ends up being stored in closets or under-utilized in other less dramatic ways. We can hope the current initiatives will not repeat the mistakes of the past.

An entire sub-field, known variously as instructional design or instructional systems, has grown up within education where research is being conducted on the properties of the interface between human learning and technology. These scholars are asking questions such as: If students have access to laptop technology with certain specifications and capabilities, what are the consequences in terms of learning gains? As important as a question like this is to answer, it misses an important idea that is vitally important to how we finance schools.

Implicit in the posed question is the idea that technology is an *addition* to an existing and otherwise unchanged instructional setting. The idea being missed is that it is common for inputs to productive endeavors to be *substitutable* for one another and that we do not need to think about technology only in terms of an add-on to existing practice. Indeed, it is at least arguable that the real power of technology to transform education will come only to the degree that technologies begin to substitute for resources, some of them quite costly, that are already in place in schools.

The idea that technology can substitute for important and costly resources like teachers without adversely affecting outcomes raises any number of sensitive and politically volatile concerns since there are longstanding worries about technologies taking jobs away from teachers along with horrific images of young minds being shaped by soulless machines.

Reluctance to entertain input substitutability possibilities is deeply seated in the field and may even be shaping the nature of the technologies that are being developed. Vendors may reason that they will enjoy greater success selling their innovations if they are conceived solely as add-ons to the store of supplemental resources teachers draw upon as they work with students.

It may be that we are hobbling the development of technology because of this reluctance to think about input substitution possibilities. Why make instructional innovations the slave of prevailing practice to the point where we are interested in innovation only to the degree that it "fits" with prevailing practice? It is remarkable how hard we work at using technology,

particularly telecommunication technology, to emulate traditional classroom instruction. For example, in efforts to meet the needs of schools in rural or isolated areas, we use electronics to make it seem as much as possible as if the students and teacher are in the same classroom, what might in fact be a very conventional classroom. Success is measured by how quick and clear the images are and how easy it is for students at the remote location to do things like write on a simulated blackboard. It is as if the conventional classroom constitutes the gold standard for education and is worthy of electronic emulation; at the same time, we are willing to be quite critical of conventional classrooms. Why not see telecommunication and computing technology as a way to break loose from the conventional classroom structure, as is the case in some of the more innovative distance education applications?

The worries about job security issues for teachers may be overblown. First, we do not know very much about how substitutable embodied human resources in the form of software and communication technologies can substitute for proximate human resources like the teacher in the classroom. This is largely an empirical question that can be answered once the research is conducted, and it may turn out that the substitution possibilities are limited. Paul Welliver, one of the early pioneers of instructional design as a field of study has observed, “Any teacher who can be replaced by a technology should be.” It may be that teachers are not easily substituted for, although this likely will vary with teacher skill levels. It may be that truly excellent teachers are not substitutable, but that substitution possibilities are much greater for more typical teachers. I return to this point later in the teacher excellence section.

Second, substitutability is going to be a matter of degree and is not an all or nothing proposition. It is possible to demonize technology as being soulless, but this misses an important point. Technology, in fact, has an important human face to it and is better thought of as an embodied human resource than as something inhuman. It is useful to draw a distinction between proximate human resources like the classroom teacher and embodied human resources such as the subject matter expertise that is available on-line. Modern technological developments are part of long standing efforts to embody human resources. Early technologies like the printing press made it possible for proximate human resources to make use of more distant, embodied human resources (i.e., the authors of text) and arguably enhanced rather than diminished the human elements of teaching and learning.

Third, if it turns out that there are considerable substitution possibilities between proximate teachers and technology, we could be looking at dramatic changes in the nature of teachers’ work and reductions in the numbers of teachers we need to engage relative to the number of students needing to be educated. But, those who are engaged will work with larger numbers of students, with responsibility for diagnosing and matching learners’ needs with a wide and growing range of powerful interventions. Teaching could emerge with the professional respect that has been so elusive for so long.

Implications for Equity, Efficiency, and Freedom of Choice

The hoped for gains accrue largely within the efficiency or more precisely the productivity category. Benefits might take the form of enhanced learning outcomes for the same investment of resources or as a reduction in the cost of achieving the existing mix and level of outcomes. Some combination of the two results is probably the most likely so that there would be gains

both in terms of students learning more and taxpayers realizing some savings, an attractive outcome to be sure and perhaps too good to be true.

Moreover, there are longer-term gains to consider. The Internet has ushered in an era of explosive growth in information, accurate as well as inaccurate, that is available at the touch of a button. Learners of all ages need skills to navigate and make sense of these data points, and success by schools at developing the ability to become less dependent on proximate teachers and more self-reliant in this environment will pay handsome dividends over time.

Equity concerns have surrounded technology from day one, but these are not much changed by a shift to substitutable rather than add-on technology. There are longstanding concerns about the "digital divide" which separates young learners who are comfortable with technology from those who have missed opportunities to have contact with technology. These inequities stem from differences in the fiscal abilities and perhaps inclinations of schooling units to offer state of the art curricula. If the hoped for benefits of treating technology as a substitutable input are real, the equity concerns could be exacerbated because the impact of technology will be enhanced thus making a denial of opportunity more serious.

The new approach to technology could also enhance choice opportunities since technology plays such a key role in providing access to information and points of view. However, there is no guarantee here, and we will need to continue to be on guard for inappropriate restrictions on the ability of teachers and students to make inquiry. Moreover, if it is true that technology development to date has been hobbled by the prior expectation that it can only serve as an add-on, a shift in the new direction should stimulate a richer research and development enterprise with a resulting gain in terms of the future power of instructional technologies.

Next Steps

Given the abundant ignorance about the input substitution possibilities surrounding resources like teachers and instructional technology, research needs to be conducted that will give us a better sense of the actual input substitutability possibilities. With this knowledge in hand, steps could be taken to encourage the kinds of substitutions that look promising. Reforms along these lines should be quite popular since there are benefits promised both for student learning gains as well as for taxpayer savings.

Job security concerns for existing teachers along with professional development needs will also need to be addressed. Presumably, some kind of protection for teachers already in place combined with opportunities to develop new skills would significantly reduce anxiety. It is important to stay focused on the longer-term gains and not be stymied by short-term and transitory costs.

An Additional Observation

A key point to keep in mind is that the properties of teaching and learning are not exogenously determined and are themselves the results of how we rear children and structure learning experiences. In other words, learners learn how to learn, and it may be that steps could be taken to make it easier for students to learn making use of instructional technologies rather than proximate human resources like teachers. In other words, even if we conduct the research envisioned above and find that substitution possibilities for teachers are modest, this need not be

viewed as an immutable result. We might take the view that it is hardly surprising to find that proximate teachers are so essential since we have taught students to be so dependent on teachers. A conscious effort to make the next generation of learners less dependent on proximate teaching resources could yield very different results, and we need to keep in mind that we have considerable control over how we shape the ability of students to learn. Here is another instance where we need to be careful not to be blinded by the properties of the status quo.

Responses to Uncertainty

Context

There are useful lessons to learn from comparisons between education and meteorology as fields of study and endeavor. Both fields deal with complex phenomena where uncertainty is widespread. And yet, the fields respond to the complexity and uncertainty in quite different and instructive ways.

Forecasting weather remains a significant challenge despite quite remarkable scientific advances, largely because of the massive scale of the system and remaining ignorance about the determinants of weather. A similar situation affects those who are trying to understand schooling and human learning. We can point to scientific progress, but there remains quite extensive ignorance with the consequence that considerable uncertainty surrounds efforts to anticipate, much less forecast, results. In schooling, arguably the challenge is even greater because at issue is more than forecasts, and the parties are also increasingly being held accountable for outcomes. We do not typically hold the parties engaged in meteorology responsible for the weather (e.g., we do not typically blame the weatherman because of some inconvenient rain), although increasingly we expect accurate forecasts. Indeed, there are growing economic consequences attached to forecasting errors, and commercial forecasters can lose business if their track record is weaker than their competitors. Of course, we take some pleasure in complaining about the perceived inaccuracy of weather forecasts even as the actual quality has increased. Nevertheless, errors continue (witness the colossally inaccurate prediction of frequent and intense hurricanes for the Caribbean during the fall of 2006); it is clear that uncertainty continues to be a significant factor within meteorology as a field.

To continue with the comparison, think of classrooms as complex weather systems. We know some things about the teaching and learning properties, but what we know is dwarfed by what we still do not understand. Think of a troublesome student or group of students in a classroom as being like the arrival of a hurricane. And let us suppose further that we are about as good at predicting the arrival and impact of these student-related disturbances in learning environments as we are at predicting the arrival and impact of hurricanes.

We do not respond to the threat of hurricanes by fortifying every city and locality equally. Rather, we assess probabilities and store up resources we then deploy differentially once we have better knowledge of where the actual hurricanes are heading and will make landfall. This does not always work well (the Katrina debacle is a recent disturbing example of how the approach can fail spectacularly), but still the approach makes conceptual sense in light of the uncertainties and is rather different from how we approach schools and the unanticipated difficulties that we ask teachers to handle as decisions are made about which students to assign to which classrooms.

Our more typical approach within education is to ask teachers (and the other students in the class) to bear up as best they can under the assault of the disruptive student(s) in the classroom. We almost seem to take the position that these hurricanes are part of the cost of doing business and that everyone has to put up with their fair share of the destruction. Moreover, we also seem to compound the problem by doing things such as knowingly assemble classes that are likely to be problematic and assign these classes to novice teachers, perhaps on the grounds that getting through hurricanes like these is part of making one's bones as a teacher.

This is costly given the predictable negative effects on novice teachers' willingness to persist, some of whom presumably would have developed into quite talented teachers, not to mention the lost learning opportunities for students. Would it not make more sense to create a Supplemental Resource Board, or some such entity, that could deliver needed reinforcing resources to meet the extraordinary needs that emerge and could not be anticipated until after the school year is underway and there is an opportunity to assess the actual demands that arise out of the groupings of students in the various classrooms (i.e., as the hurricanes make land fall). This Supplemental Resource Board might exist at the local or, perhaps more logically, at the regional or state levels. Site visits could be conducted as the year gets underway, and supplemental resources could be deployed on a temporary or more long-term basis depending on the circumstances. The key would be to make quick assessments of need and to respond accordingly. It will be important that the interventions be widespread enough so that being on the receiving end is not viewed as some kind of stigma. Progress would be monitored and adjustments in the supply could be made periodically over the course of the year. Governance questions would need to be sorted out since multiple authorities might be involved, and it should be clear that the allocations are temporary and pin pointed, lasting no more than a full academic year. At the end of each year, the allocations would be gathered up, and a re-allocation would take place early in the next year.

Implications for Equity, Efficiency, and Freedom of Choice

An intervention designed along these lines would have benefits in terms of both equity and efficiency. Equity would be advanced to the degree that students are protected from capricious exposure to the adverse effects of dysfunctional groupings of students that create "hurricanes" in their instructional space. Current practice passes an equity test, in a strange sort of way, to the degree that students are equally exposed to these disruptions. Thus, only in the unlikely case that the disruptions are evenly distributed are students "fairly" disadvantaged. More realistically, the burdens are quite unequally distributed, and one suspects students coming from lower-income families and attending schools with less fiscal capacity are more likely to encounter these disruptions. Interventions that are designed to contain and offset the effects of these discrete instances of dysfunction could have salutary equity effects.

Efficiency benefits can also be discerned since students will be making better use of their time. Expenditures and the supply of resources may increase, but there ought to be corresponding gains in pupil performance. Moreover, teachers may feel better supported, and effective teachers will be more likely to remain in the teaching force, thereby relieving the system of costs associated with teacher turnover.

There would not seem to be much impact on freedom of choice other than to reduce incentives to exit dysfunctional instructional settings, assuming the interventions being contemplated turn out to be effective at containing the damage.

An Additional Observation

The scope of this argument is relatively narrow because it presumes the broader system is basically functional and that the difficulties occur when unfortunate combinations of students create problems that are hard to anticipate. As such, the argument sidesteps the perhaps more serious problem where the system is so overwhelmed that the weather, so to speak, is consistently horrible and just getting worse and worse and where the difficulty cannot be reduced to a definable single storm or series of storms, hurricanes or not.

Moreover, the argument may be overstating the case since there are occasions when schools provide differential staffing in response to unexpected difficulties in particular classrooms. However, the practice does not appear to be common, and given conventional thinking there may be some tendency to see the need for additional resources as a negative reflection upon the teacher along with some expectation for the teacher to "pay-back" for the extra help in some way in the future.

Even in the face of these caveats, the argument calls attention to the role of an important feature of educational systems (the uncertain nature of the underlying teaching and learning technology) and identifies a fresh way of thinking. Rather than being held hostage to unrealistic and even foolhardy efforts to nail down everything in teaching and learning with scientific precision, the new thinking involves accepting the reality of uncertainty and working to become as nimble as possible at responding appropriately to the hot spots that will inevitably develop. The new approach gets rid of the pernicious idea that hard classes and disruptive students are simply something teachers (and students) have to endure.

The Dysfunctional Pursuit of Excellence

Context

It is customary in education to assign a high priority to the pursuit of excellence. The term itself is widespread and one of the difficulties is that it is so frequently used that it can become hackneyed and even a caricature of itself. But, rhetorical excess is really the least of the problems. More disturbing is a failure to recognize how problematic the unbridled pursuit of excellence can actually be. The downside to the unbridled pursuit of excellence can be seen by realizing that excellence comes at some cost and that these costs are likely to escalate as higher and higher levels of excellence are reached.

The costs of excellence tend to be shrouded for several reasons. In the case of prominent athletes and performers, the time and effort required to reach stratospheric heights of accomplishment are either not talked about or described in gauzy and highly romantic terms (e.g., Tiger Woods's father taking the young lad out on the golf course at an early age). Moreover, one of the features of persons who perform at extraordinarily high levels is a tendency to make the accomplishment look effortless, including the great teachers of the world who routinely mislead aspiring teachers into thinking that excellent teaching is actually not that hard to accomplish.

The tendency to make extraordinary accomplishment look easy helps to fuel the view that excellence is not so much a matter of hard work and more a matter of being gifted and floating

above the others. Even if excellence is more a matter of being chosen rather than the result of lots of hard work in combination with talent, there remains a cost dimension since the truly chosen are in very short supply and will be able to command a price in the market.

The idea that everyone can be excellent is mischievous and misleading. The whole point of being excellent is that the individual's performance towers over the performance of others.

Moreover, something like excellence in teaching is much less well defined than the frequent use of the term would suggest. Teaching is complex and any serious effort to compare the performance of one teacher to another is going to involve assessments along any number of dimensions. Suppose we have a teacher whose performance along one dimension truly is "off the chart" but whose performance along the other dimensions is more in the middle range. How should we compare this teacher with a colleague who lacks the "off the chart" performance along one dimension but whose scores taken collectively are superior to the first teacher? And how do we factor in the fact that teaching effectiveness is highly dependent on the interaction with students with the likely consequence that some teachers will be more effective with some students than with others. Shall we insist that truly excellent teachers will only be those who are consistently "off-the-chart" on all identifiable dimensions and consistently highly effective with every possible student and group of students they encounter? This will indeed be a small, elite group, perhaps even a null set.

It is clear that excellence is a more murky concept than commonly supposed and that its pursuit is not without costs. With this as our starting point, there are several pitfalls to be sensitive to as part of any effort to place serious emphasis on promoting excellence in teaching.

Supply and Demand Issues

Excellence by its very nature is going to be in short supply, and excellent teachers are likely to have numerous options in other fields that are more able to offer attractive compensation. So long as we remain wedded to teacher compensation practices that fail to differentiate pay on the basis of performance, attracting and retaining truly excellent teachers is going to be difficult if not impossible.

Moreover, even if we could make changes in compensation to offer competitive wages for the excellent teachers, does it follow that this is the best use for their considerable talents, particularly if we persist in our current practice of assigning them to discrete classes where they work with relatively small numbers of students? Can we assume that the gains for this finite number of students are sufficient to justify this as the best use of the excellent teachers' talents? Would it not be better to find ways to share the benefits of excellence more broadly? Thus, one of the structural problems in schools in their current form is the truncated nature of the excellent teachers' zones of impact.

And if we are changing the compensation system so that we can attract and retain excellent teachers, there will be upward pressure on costs. Tradeoffs will have to ensue, either within the education sector or elsewhere within the society. Would we be comfortable increasing average class size, for example, as a way to finance the premiums that would have to be paid to attract and retain the excellent teachers?

Returning to the input substitution argument, recall Paul Welliver's point that any teacher who can be replaced by technology should be. It may be that there are extraordinary teachers

who cannot be substituted for by any known technology. But, suppose it is also the case that substitution possibilities do surround less extraordinary teachers. If so, why not take advantage of the substitution possibilities where they exist, particularly if some savings can be realized? Why not view these substitution possibilities as a means of enhancing the effectiveness of the vast majority of teachers who are engaged in the endeavor. Why let the capabilities of highly atypical individuals (the excellent teachers) inhibit the more effective utilization of what technology has to offer the field of education?

Production Issues

There are many unanswered questions surrounding the preparation of teachers. Teacher educators labor mightily in their efforts to prepare the next generation of teachers with limited guidance from the research literature. We make the problem even more difficult if we draw a distinction between what it takes to prepare a good teacher in contrast to an excellent teacher. As we saw earlier, the meaning of teacher excellence remains unclear. What can the truly excellent teacher do that a merely good teacher cannot do? Is excellence the same at the primary grade levels as at the secondary and post-secondary levels? Is it the same across content areas?

Suffice it to say that this is disputed terrain within the field of education and that the resulting uncertainties make it more problematic to pursue aggressively a teacher excellence agenda.

Teacher Mediocrity

What about the other extreme in the teacher quality distribution? Teacher mediocrity warrants attention and faces its own definitional issues. We can distinguish between true disasters in the classroom and those teachers who are more functionally mediocre.

The existing system is actually fairly good at cleansing itself of the true disasters. Considerable filtering goes on in pre-service teacher preparation programs so that the schools are spared seeing these disasters. Moreover, when disasters are hired into the schools, the schools themselves are quick to cut them loose, sometimes with remarkable speed. Often the separations are mutually agreed to because it can be such personal, public, and daily torture for the teacher whose performance is a disaster.

It is the functionally mediocre teachers who are more problematic for the schools and students. These are the teachers who perform at relatively low levels but who have learned to get by. The classes are reasonably orderly. Not much may be happening in terms of student learning, but the system runs and the time passes. These are the teachers who may exist in large numbers and who warrant more attention in terms of stimulating professional growth and improved performance.

An Alternative Strategy

The point is not that excellence in teaching is bad and something to be eschewed, but rather that we need to be attentive to the outliers in the right tail of the teacher quality distribution as well as those who are found elsewhere in the distribution. System-wide improvement is not going to come from just taking the elite and moving them further to the right in the distribution of teaching talent, and yet this seems to be the focus of at least the rhetoric surrounding our reverence for excellence in teaching.

It makes more sense to pursue strategies that address the full range of teaching talent. In particular, efforts can and should be made to provide better definition of teachers' workloads so that teachers, the excellent as well as the not so excellent, are able to specialize in the areas where they have expertise.

For those who are excellent, why not take steps to bring them into contact with larger numbers of students than would normally be the case? Why not let the class sizes of the excellent teachers grow larger to the point where the marginal benefit of being in the excellent teacher's class is equal to the marginal benefit of being in the smaller class of the less excellent teacher? In such a world, the "unfairness" attached with some students being assigned to the excellent teacher versus other students assigned to the less excellent teacher would be substantially reduced. One could imagine parents, for example, being indifferent between having their child assigned to an excellent teacher's class of 60 versus being assigned to a less excellent teacher's class of 15. In such a world, the excellent teacher handling the 60 students would logically be entitled to more generous compensation than would the less excellent teacher handling the 15 students.

And for those who are not excellent, why not work with them to define and develop more narrowly drawn areas of expertise than is normally the case? Rather than improve performance in multiple areas simultaneously, narrow the focus and set more realistic, attainable, and measurable goals. This narrowing of focus could fit quite logically with parallel efforts to promote substitution possibilities with technology. There could emerge a much more differentiated set of roles for professionals in instructional settings that complement various kinds and uses of technology. Medicine is a field that has made significant progress at achieving greater role differentiation, including the creation of physician assistants and nurse practitioners who now handle numerous duties that were previously assigned to physicians. Teaching appears to have reached a stage where greater role definition could be advantageous.

Implications for Equity, Efficiency, and Freedom of Choice

A shift in emphasis away from the unbridled pursuit of excellence to a more balanced focus on all sections of the teacher quality distribution has the potential to generate significant benefits for both equity and efficiency. Of course, much depends on how the improved performance levels of teachers in the middle of the distribution are distributed across the system. Programs like those operated by the National Science Foundation to improve the skill sets of science teachers have a tendency to attract participants who already appear to be located in the upper parts of the teacher quality distribution. Conscious efforts to engage teachers in the lower sections of the distribution fit logically with this effort to shift away from the unbridled pursuit of excellence, but care would need to be exercised in how such programs are described so that they are not off-putting. There is not much point to advertising a professional development program for weak teachers.

Differences Between Interesting and Hard

Context

In medicine, we witness well-established institutions like teaching hospitals, often located in urban areas, that serve patients from highly varied economic circumstances. These teaching hospitals are directly connected to professional preparation programs in medical colleges. Teaching hospitals attract top researchers in the field whose work is considered relevant for neophytes. Medical colleges find ways to tap into this expertise and see it as an important part of the preparation they offer students who are relatively early in their study of the field. Moreover, the medical services they provide are broadly available and reach disadvantaged individuals because the cases under study are broadly distributed across income categories. The approach is appealing on numerous grounds, the fiscal crisis of many teaching hospitals notwithstanding.

In education, the record of the interface between research and the world of practice is more troubled. There is, for example, a history of laboratory schools where the rhetoric is similar to how we describe teaching hospitals, but many laboratory schools evolved into elite private schools serving universities' felt need to provide schooling services for the children of faculty members. More recently, professional development schools have emerged and are intended to strengthen links between colleges of education and the schools, but these schools vary widely and only occasionally involve a serious research component.

There is a pervasive and sharp divide between the research-oriented faculty in colleges of education and those who prepare the next generation of teachers. Partly this occurs because the research-oriented faculty members are small in number and are often based in fields like educational psychology that are only indirectly connected to teacher preparation. And partly this occurs because it has become possible and even fashionable to conduct research in ways that are disconnected from schools.

One of the keys to the success of the urban teaching hospital that serves the health needs of patients from highly varied economic circumstances is its ability to deal with interesting problems for the field. It is interesting medical problems that attract the attention of the top researchers in the field, and it is interesting medical problems that arguably have pedagogical value for students of medicine. We can speculate that one reason we see nothing similar to urban teaching hospitals serving a diverse clientele in the field of education is that we have not succeeded at making education problems in the field interesting.

What does it take to make a problem interesting? Several attributes comes to mind: First, the problem needs to be tractable, and there needs to be some feeling that progress can be made if the requisite effort is made. In other words, lost causes, or causes that are perceived to be lost, are not very interesting.

Second, (and this is a variation on the first attribute), there needs to be some understanding about what kind of expertise is needed to deal with different aspects of the problem. Or, the problem needs to be divisible in the sense that persons with the relevant expertise can make progress, even if other aspects of the problem remain intractable.

Third, for a problem to be interesting, its solution needs to have a significant impact. The expected impact might be narrow or broad, but there needs to be some reason for believing that it is real and that something real hangs in the balance.

And fourth, the necessary work needs to be reasonably convenient and not disagreeable. A problem could be otherwise very interesting and engaging, but barriers will inhibit participation. Steps can be taken to reduce the barriers or alternatively compensation can be offered to increase a willingness to put up with the inconvenience.

With this as an initial means for assessing the interest level of problems, how do medical and education problems compare? With respect to whether or not a solution is significant, I see no inherent difference. Education problems are certainly important and the stakes are high; the same can be said for medical problems. Some medical problems may be more narrowly focused, but this does not mean they are unimportant.

I do see differences in how tractable problems are across the fields. Medicine has enjoyed greater success at breaking problems into manageable pieces, developing responses and interventions, keeping track of the results so that the evidence is cumulative, and disseminating findings. It is not that medicine is without its difficulties, but education as a field has lagged in its ability to progress in these ways.

In terms of the convenience of the work, in medicine there is a level of mobility that can make things more convenient for the top talent. The patient with an interesting medical problem can sometimes do the traveling and come to a center where the relevant expertise is concentrated. However, this will not always be the case and sometimes medically interesting problems are place-bound and related to things like climate and cultural practice. In these cases, the medical expertise may face the inconvenience of needing to travel long distances.

Education tends to be quite place-bound and the relevant expertise may need to travel to the site. Education's collective nature also makes relocation for the convenience of those with the relevant expertise less viable.

Thus, the significant difference across the fields lies in the comparatively intractable nature of the problems being faced by the field of education. If the problems are intractable, they are less interesting and it follows that it will be more difficult to attract the talents of the researchers who are best equipped to provide answers to the underlying questions.

What is making the problems in the field of education so intractable and therefore uninteresting? Partly it is the limited progress that has been made, but this is not unique to education. All fields start with relatively little knowledge in hand. Just because education's present knowledge base is limited neither makes the problems uninteresting nor precludes future growth.

Part of the explanation can be found in the small number of truly talented individuals with the ability and interests to do the relevant research. Not many people have been engaged and the field is still relatively new. This shortage is being recognized, and welcome new resources are being made available to expand the number of future researchers who have good skills for conducting powerful studies. The argument is actually circular since the current shortage of skilled researchers with interests in education is related to the paucity of interesting problems in the field.

Another part of the explanation can be found in the nature of current practice where problems are so overwhelming it becomes difficult to establish an analytical foothold. We have responded by expecting researchers to develop ingenious designs for studies to overcome the quirks of practice that make the research difficult to conduct. It would be better to shift the burden away from researchers and toward the world of practice so that there is greater willingness to adjust practice so that we can get definitive answers to important questions for the field.

This plea for adjusting practice so that it is more amenable to study and richer in the supply of interesting problems has the potential to be quite far reaching. When schools become so highly dysfunctional due to concatenations of far-reaching and interconnected problems, it is hard to imagine how the phenomenon can lend itself to fruitful study.

If we are serious about making educational practice more amenable to study, would we know how to proceed? The answer is yes and would involve disentangling practices so that cleaner differences can be monitored and assessed. The more difficult question is whether there is a political willingness to disturb the operating, but at times quite dysfunctional, status quo.

While this strategy is compatible with the existing growing emphasis on research with experimental designs, there is an important extra expectation for how we practice education. In other words, the burden is not solely on the researcher, but there emerges instead a shared responsibility to generate interesting problems that will attract the interest of the relevant parties.

Crossing from Interesting to Hard

What happens when interesting problems become hard or otherwise intractable? As we have seen, the hardness of the problem will at some point undermine how interesting the problem is, and there are interesting (and hard) empirical questions to ask about the tradeoffs between hardness and interest levels. Indeed, some minimal level of difficulty is probably necessary for a problem to be interesting. If the problems in a field were all easy to solve, it would not be much of a field.

Finding the proper balance between hard and interesting is the key for attracting and retaining the efforts of the research community. It is this balance that moves a field forward, and it is this balance that has proven to be so elusive for the field of education. In short, problems in the field of education have been made too hard. This need not be the case. We can take advantage of the control we have over how education is practiced to make changes that will make practice more amenable to study. If the problem thereby becomes less hard and more interesting, the talent will arrive and the stage will be set for further improvement as we gain more knowledge.

Toward Synthesis

Imagine a world replete with a public educational system enjoying unprecedented popular support because of success at more precisely linking benefits received with costs imposed, thanks to the advent of differential add-ons and variable pricing. Such a system will start off impressively and just get better as parents gain experience with matching services to their children's needs. Aspirations for pupils are likely to increase over time as parents with modest economic means come to realize that the subsidized costs they are asked to bear for additional

services represent good value. Local school board members will rise to the occasion and make principled decisions about what to include and exclude from the basic program. The state will step in and ensure equity in the availability of both the basic program and whatever add-ons are chosen by parents. The measured introduction of market pressures thanks to this reform will add a refreshing level of self-regulating discipline.

Also, imagine a world where we succeed at shifting away from the current heavy reliance on costly proximate teacher resources in favor of embodied human resources delivered, thanks to the creative use of modern computing and telecommunication technologies. As teachers take on these new roles, their impact and level of professionalism will increase with concomitant increases in social status and economic standing. Classrooms will have a very different look and feel under this scenario, and students can look forward to much more individually tailored and effective learning experiences. Longer-term benefits also arise to the degree that students become skilled at taking advantage of electronically conveyed information. The exponential growth in the availability of information is making it increasingly incumbent upon the schools to equip students with the skills to take charge of their own learning.

Build into this world a capacity to respond quickly and effectively to instances where things are not going well in school settings because of unexpected problems that can be traced to our limited understanding of teaching and learning phenomena. A regional Supplemental Resource Board will be equipped to make emergency allocations of resources to instructional settings where demonstrable problems exist. Data systems will be in place to pinpoint these locations, and action will be taken before the students lose ground that we know can be so difficult to re-gain.

Add to this world a differentiated staffing structure so that we make better use of excellent teachers and where other educational professionals are able to develop particular areas of expertise. There are significant implications for both the roles we define and the professional development and pre-service preparation we provide, and many of these changes can and should be made in tandem with shifts in the utilization of computing and telecommunication technologies.

Finally, imagine a world with a vitalized education research and development effort that attracts top intellectual talent because the hard problems have now become interesting, thanks to improved partnerships between practitioners in the field and researchers who are seeking new insights into improvements in practice. The professional development schools we see today in education are early steps in the right direction toward strengthening these partnerships, but much more needs to be done.

This is an attractive world. Is it an achievable world? I answer with a qualified, “yes.” Resources should not be a barrier. Significant savings should be forthcoming, thanks to a successful substitution away from the use of proximate and toward the use of embodied human resources. Moreover, the differential add-on idea has the potential to tap into people’s fundamental willingness to support education along with their willingness to make sacrifices for children. I could imagine a significant increase in the size of the education sector of the economy as a consequence of achieving a better match between people’s preferences and the costs they are expected to bear, thanks to the differential add-on and variable pricing mechanism.

Several of the other ideas would require funding, but the magnitudes should be manageable, particularly in light of the potential for savings. We could begin experimentally with the

Supplemental Resource Board idea and adjust the scale as we gain experience. The differentiated staffing idea carries costs, but these could also be covered by pulling back from the existing investments in professional development that are so widely perceived to be ineffective.

The chief reason for the qualified nature of my “yes” lies in my respect for the political power of vested interests that will be made nervous by the far reaching and transformative nature of the reforms, not to mention the numerous logistical matters that need to be resolved. It is not unreasonable to be made nervous by these ideas. They are far-reaching with hard to predict effects, and this is probably most true for the differential add-on and variable pricing idea. The key will be to find ways to experiment incrementally with the approach and in ways that permit returning to the earlier state of affairs if the reform proves to be faulty.

I hope this paper stimulates further thought in these directions, particularly in terms of implementation and how the ideas might be tested experimentally. We are at an important series of crossroads in school funding, and there is merit in trying to think out of the box and in terms of fundamental change.

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