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## Specific Challenges in Coordinating and Administering the Coproductio n of Education Services

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Most of the literature on education administration addresses its subject as the *delivery of education services*, *providing education services*, or the *production of education services*. Teachers and schools deliver, provide or produce education services. Evidence that students received the services is found in moving from one grade level to the next and/or their demonstrated mastery of specific subjects. The mind set conjured up by these formulations focuses on the compensation and skills of teachers, hierarchical arrangements, schemes for accountability or control and seeking appropriate economies of scale through consolidations or decentralizations. More recently many reformers have advocated parent and student choice through education vouchers and charter schools (Chubb & Moe). These reforms do not escape the fundamental assumption that education services are produced and delivered by teachers and schools. Families and students may change from one “provider” to another when the problem could just as easily be the contribution of a student to his/her learning.

Education services are not delivered, provided or produced; they are *coproduced*, i.e., teacher and student jointly produce the education service (Ostrom; Parks et. al.; Whitaker). A teacher teaches and a student learns, together coproducing education services. Further, this coproduction process is asymmetric. The contributions of the student are absolutely necessary for learning to happen. Students learn many things on their own (Cremin). Professional teachers typically get involved when students seek to master specific bodies of knowledge or skills that are learned cumulatively through organized instruction. These teachers are part of an organized school in which there are administrators, faculties and recognized curricula to be mastered.

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Resources necessary for coproducing education services in these schools are provided through a complex mix of public and private arrangements. In K-12 most monetary resources are provided through public taxation. Many non-monetary resources essential in student learning are ignored or at the least taken from granted. This is a dangerous omission when a service is coproduced, as is the case with education services. Much more attention is lavished on such issues as the specifics of training and certifying teachers, consolidation or decentralization to capture appropriate economies of scale, reorganizing hierarchical and organizational arrangements within schools or school districts and devising schemes to hold teachers and schools accountable. Such concerns with hierarchy, accountability and scale economies may (or may not) support students and teachers as they together coproduce education services. In any event, a well organized school and school district can do little in terms of coproducing education services if students are not motivated to make their contribution.

In this paper I argue that intrinsic in the core technology for education services are a number of specific challenges for education administration. I begin with a theoretically-grounded description of the core technology of education services. Working from that description of the core technology I move to analysis of some of the specific challenges to coordinating *and* administering the coproduction of education services.

## **I. THE CORE TECHNOLOGY FOR EDUCATION SERVICES**

### **Uncertain Technology**

I use the concept of technology to mean a purposive process of combining resources to produce a desired result. To illustrate with a simplified example, when you combine cream, sugar and chocolate, then churn for 25 minutes at a temperature below freezing, the result is chocolate ice cream. You will produce chocolate ice cream every time if you use proper ingredients and consistently follow instructions for combining and churning. The technology for coproducing education services is, by comparison, very uncertain. There are many different types and qualities of education services and in any given effort at coproduction there is almost always ambivalence as to which types and qualities are desired, *i.e.*, we are ambivalent about what we desire to coproduce. Further, there is even greater uncertainty about which resources to combine and what changes in the service occurs if we increase or decrease one or another of these resource inputs, *i.e.*, knowledge about the cause/effect relationships among resource inputs are very incompletely understood. Therefore, the first attribute we must take into account when coordinating the coproduction of education services is that the core technology is imperfect -- meaning there is ambivalence about the desired mix of outcomes and imperfect knowledge about the cause/effect relationships when resource inputs are combined (Thompson, pp. 83-98).

It turns out there are many uncertain or imperfect technologies, with concentrations of these technologies in the production and/or coproduction of services. James D. Thompson argued that an organization's core technology and the characteristics of its task environment in large part determine the design its organizational structure, its dependence on its task environment and the

assessment of its performance (Thompson, chapters 2-6). Lex Donaldson elaborated and refined Thompson's classifications of technologies and task environments into a *structural contingency theory* (Donaldson, pp. 35-59).

### **Intensive Technology**

Thompson identifies three general varieties of technology – long-linked, mediating and intensive. A *long-linked technology* involves a serial interdependence where A is completed before B, B is completed before C, and so on. A *mediating technology* links clients or customers who wish to interact in some way. A telephone company is an example. Conversations are linked by a mediating technology, *i.e.*, a telephone system. All users of a telephone system are, thus, interdependent. An *intensive technology* is one where A and B are reciprocally interdependent in the production of the good or service (Thompson, pp. 15-18).

Education services are delivered through an intensive technology. The student and teacher, as part of an intensive technology, are *reciprocally interdependent*. The teacher teaches. The student learns. Together they coproduce education services. The contributions of teacher and student are coordinated through *mutual adjustment* (*ibid.*, p. 56). When delivering a service via an intensive technology, boundaries between participating institutions are of necessity open to the task environment. In the case of education services, mutual adjustments between teacher and student require, in almost all circumstances, a local presence with the student (and parents) moving daily back and forth across the physical and organizational boundary of the school. Distant locations and large classes are distinct impediments to effective delivery (Porter, 1976; Daft, pp. 255-58). And because neither the school district nor the teacher can guarantee the ability and/or motivation of students, assessments of student performance must consider efforts of both teacher and student (Thompson, p. 95-6).

### **Coproduction**

The concept of *coproduction* is an essential compliment to Thompson's concepts of intensive technology. That many public services were coproduced was in general discussion in 1970s. For instance, I had frequent discussions during that time with Harvey Garn, Michael Springer and Michael Flax, a research team at the Urban Institute, who described the phenomena as joint production:

. . . the person being served (the client or customer) is inevitably part of the production process, if there is to be any production whatsoever. Therefore, the resources, motivations, and skills brought to bear by the client or consumer are much more intimately connected with the *level* of achieved output than in the case of goods production. The output is always a jointly produced output. Garn, *et. al.*, 14-15. Quoted in Parks *et.al.*, p. 381.]

But it was Elinor and Vincent Ostrom and their colleagues at the Workshop in Political Theory and Policy Analysis at Indiana University who gave the phenomena sustained attention: “. . . the productive role of consumers as *coproducers* of the services they receive has been a continuing

interest for us” (Parks, *et.al.*, p. 382. Italics in original). They coined the word *coproduction* and gave it analytical content within economics. They sharply distinguished coproduction processes from production processes of manufacturing. In coproduction, they observed that:

. . . individual consumers or groups of consumers, *acting outside of their regular production roles*, may contribute to the production of some goods and services they consume. In such cases they act as *consumer producers*. In many instances, consumer production is an essential complement to the efforts of regular producers; without the productive activities of consumers nothing of value will result. This appears to be characteristic of much public service production (*ibid.* Italics in original).

Their separation of the roles of *regular producers* and *consumer producers* facilitated the formulation of coproduction as an analytical concept:

Coproduction involves a mixing of the productive efforts of regular and consumer producers. This mixing may occur directly, involving coordinated efforts of regular producers and consumer producers. Coproduction, if it occurs, occurs as a result of technological, economic, and institutional influences. Technology determines whether there are production functions for a service where both regular and consumer producer activities contribute to the output. Economic considerations determine whether it is efficient to mix regular and consumer producer activities to produce the service. Institutional considerations determining whether appropriate mixing is allowed in situations where coproduction is technically feasible and economically efficient and whether mixing is discouraged where it is inefficient (*ibid.*).

For our purposes this formulation is very helpful. It mandates a more inclusive focus, inside and outside the formal boundaries of a school, on the primary participants in processes of coproducing education services. And their discussion of *technical feasibility* is easily extended to include my analysis of the core technology using concept of intensive technology within structural contingency theory. I believe that the addition of this description of the core technology adds significantly to analyses of the institutions involved in coproduction. Those analyses are the focus of the second section of this paper.

But, all coproduction is not the same. Workshop colleague Gordon P. Whitaker identified three types. His third type occurs when the client is transformed in the process of consuming the service, as in the coproduction of education services -- “I teach, you learn.”

The pupil and the parents, as much as the teacher, influence the education that that pupil obtains. The best of lesson plans, instructional materials, and teaching techniques cannot educate the child who will not learn. Coproduction is essential in services which seek to change the client (Whitaker, p. 241).

Whitaker makes the point that teacher and student must willingly participate in mutual adjustment to be successful in the coproduction of a public service such as education.

In an exchange of this type [mutual adjustment], both the citizen and the agent share responsibility for deciding what action to take. The citizen coproducer is not a “client” in the sense that he or she is not a supplicant seeking the favor of the agent (Whitaker, p. 244).

Consumer producers may participate in coproduction for different reasons. John Alford examined *why* citizens may voluntarily participate in coproduction. Consistent with Whitaker's earlier analysis, he found citizens are more likely to participate generally in coproduction as willing volunteers.

Material rewards and sanctions are ineffective in eliciting the requisite client contribution for all but the simplest of [coproduction] tasks. Instead, clients are motivated by the more complex nonmaterial incentives that coproduction scholars have identified as influencing other kinds of coproducers such as volunteers or citizens: intrinsic rewards, sociality, and expressive values (Alford, p. 51).

Together, then, Whitaker and Alford consider two broad categories of citizen coproduction. First there is coproduction that adds additional value to a public service but is not essential to the production of the service. Second, there is coproduction that is an *integral part* of producing the completed public service *but* a citizen/client may or may not choose to participate in the coproduction process. Education services are clearly of the second type.

I want to single out and reinforce two aspects of coproduction of education services from my analysis above. First, coproduction is not optional when it comes to education services. "Students can supply much of their own education in the absence of teacher inputs, but teachers can supply little education without inputs from students" (Parks, *et. al.*, p. 384). Further, as the Ostroms and their colleagues recognized, there is an inherent asymmetry in coproductive contributions by student and teacher. If a student is absent, inattentive, actively resistant, intellectually unable or unprepared, there will be no learning and hence no education services coproduced.

Not all coproduced services share with education the absolute necessity for coproduction. Two quick examples of where coproduction is absolutely essential are education services and the rehabilitation of a drug addict. In both cases, authorities can confine, indefinitely, the student or the addict but the *desired* learning or rehabilitation is not produced without active acquiescence and participation by the student or addict. Other public services may occur at acceptable levels without coproduction. Police services, for example, are qualitatively better if citizens are actively involved in coproduction but they can be delivered at acceptable levels to passive or indifferent citizens.

Second, the motivations and skills of consumer producers to participate in coproducing education services vary widely. Workshop scholars Rosentraub and Sharp make the point that *some students and/or their families* are more skilled in coproducing education services than others.

Wealthier, better-educated, or non-minority citizens may be more willing or able to engage in coproduction activities. To the extent that coproduction raises the quality of services received, it may exacerbate gaps between the advantaged and disadvantaged classes (Rosentraub and Sharp, 1981, p. 517; cited in Brudney and England, p. 64).

Rosentraub and Sharp's observations are consistent with the very large and empirically-grounded literatures that have identified poverty, discrimination and recent immigration as systematically contributing to lower academic achievement. Jonathan Kozol, a sometimes polemical but persistent contributor to this literature, provides details on why poor minority parents are less successful in the processes of coproducing education services with their children.

Children who have had the benefits of preschool and one of the better elementary schools are at a great advantage in achieving entrance to selective [magnate] high schools; but an even more important factor seems to be the social class and education level of their parents. This is the case because the system rests on the initiative of parents. The poorest parents, often the products of inferior education, lack the information, access and the skills of navigation in an often hostile and intimidating situation to channel their children to the better schools, obtain the applications, and (perhaps a little more important) help them to get ready for the necessary tests and then persuade their elementary schools to recommend them. So, even in the poor black neighborhoods, it tends to be children of the less poor and the better educated who are likely to break through the obstacles and win admission" (Kozol, p. 60).

### **Studies Validating Coproduction**

That education services are coproduced and that the skills and motivations to participate in the coproduction processes vary widely among students and their families are one of the most widely accepted generalizations in social sciences. Admonitions and advice about the necessity of involving students in their own education go back at least to the Greeks. Below are selections from the philosophies and admonitions of earlier thinkers, that recognized either explicitly or implicitly that education services are coproduced:

Quintilian ( on Roman education): Zeal for learning depends upon inclination, a thing which cannot be forced . . . the mind as a rule refuses tasks imposed by harsh compulsion (Lawrence, p. 42).

St. Augustine: When the interior truth makes known to them [students] that true things have been said, they applaud, but without knowing that instead of applauding teachers they are applauding learners. . . . And since after the speaker has reminded them, the pupils quickly learn within, they think that they have been taught outwardly by him who prompts them (ibid., p. 51).

Rousseau: Do not forget that it is rarely your business to suggest what he [a child] ought to learn; it is for him to want to learn, to seek and to find it (ibid., p. 163).

Kant: One of the great problems of education is how to unite submission to the necessary *restraint* with the child's capability of exercising his *freewill* – for restraint is necessary. How am I to develop the sense of freedom in spite of the restraint ? I am to accustom my pupil to endure a restraint of his freedom, and at the same time I am to guide him to use his freedom, and at the same time I am to guide him to use his freedom aright. Without this all education is merely mechanical, and the child, when his education is over, will never be able to make a proper use of his freedom (ibid., p. 184).

John Dewey: The introduction to techniques must come in connection with ends that arise within the child's own experience, that are presented to them as desired ends, and hence as motives to effort . . . The

prime psychological necessity is that the child see and feel the end as his own end, the need as his own need, and thus have a motive from within . . . for . . . mastering the rules (ibid., p. 42).

There have been numerous and extensive empirically-supported studies seeking explanations on why some children are more successful in schools than others. Efforts associated with President Lyndon Johnson's War on Poverty catalyzed a spate of these studies, most notably a major, multi-year study lead by James Coleman (Coleman, *et.al.*). Title I of the Elementary-Secondary Education Act, by far the biggest Federal aid to education program in the U.S. to that date, targeted millions of dollars on compensatory programs for "educationally-deprived" students. Evaluators, however, found little or inconsistent evidence students assisted by Title I narrowed the achievement gap between them and students not assisted by Title I. Coleman, a renowned sociologist, and several colleagues launched a large study, supported by extensive data collection. They found that much student achievement was explained by factors other than the school facilities and faculty. Contributions from students, parents, peers and community environment -- *i.e.*, coproduction -- explained at least as much of their achievement as variables related to schools and faculties. These findings have been amplified and refined in numerous studies, with the results substantially verified.

A couple of recent examples reaffirm Coleman's fundamental finding that education services are coproduced. Melhuish studied the impact of preschools on later academic performance. He found that three variables associated with a student's home life impacted later learning more than the effectiveness of preschool or primary school. Mother's education, home learning environment and a measure of family socioeconomic status were all shown to have more influence on later student achievement.

. . . HLE [home living environment] effects were substantial and occurred across the whole population. The HLE had low correlations with parents' socioeconomic status or education . . . and showed independent effects slightly less than mother's education but greater than father's education and family income. This indicates that what parents do is as important as who parents are" (Melhuish, p. 1162).

Lahaie began her study of the influence of parental involvement on achievement by students from immigrant families with a summary of earlier studies.

Long-standing social science has shown that parents' involvement in their children's education improves their children's achievement, even after the students ability and family socioeconomic status are taken into account (Lahaie, p. 685).

Lahaie developed a relatively comprehensive measure of *Parental Involvement*, purposely going beyond parental involvement in schools, with the three components of her Parental Involvement variable -- *Cognitive Learning at Home*: literacy activities – reading a book to child, telling stories to child; activities with academic content – building projects, teaching about nature, creating art, singing songs, playing games; other activities without academic content – sports, doing chores. *Cognitive Learning Outside the Home*: Four types of care arrangements in year before kindergarten – parental care, center-based care, Head Start, other forms of care. *Parental*

*Involvement at School* was a dichotomous variable measured whether parent had already met with teacher once since school started (*ibid.*, pp. 688-9). She also included as covariates the usual list of child and family characteristics -- Child: birth weight, current weight and height, age, gender, race/ethnicity. Family: family structure, family size, city/rural, region of country, educational attainment of each parent, work status for both mother and father, mother's age at first birth, household income, family use of WIC (*ibid.*, pp. 689). For immigrant children, "[t]he joint impact of all in-home cognitive learning activities is significant for both math scores and English proficiency (*ibid.*, pp. 695)." Lahaie found that for children from both immigrant and non-immigrant families, "[a]ll cognitive learning activities in home still have a joint impact that is significant. . . . Parental involvement appears beneficial for all children and especially for the children of immigrants whose parents speak another language (*ibid.*, pp. 702)."

### **The Student/Teacher Nexus**

Beginning with the core technology as the unit of analysis makes it clear that if you are going to intervene to improve student performance, efforts must focus on affecting what happens at the *student/teacher nexus*. A brief vignette, from a *very ordinary* day at school, unambiguously demonstrates the necessity of beginning at the student/teacher nexus when assessing capability to coordinate and administer education services.

#### A Vignette

Tom, age 10, is roused by his parents an hour and a half before he must walk out the door to meet his school bus. He dresses in clothes purchased and kept clean by his parents. A parent makes sure Tom eats a sufficient breakfast. As he heads out the door a parent checks to see he has all of his books, school supplies and lunch or lunch money.

Tom is greeted at school by his home room teacher. Instruction begins by reading aloud a chapter in social studies. The teacher and students listen to each other, offering corrections and help as needed.

Next the teacher moves to a lesson in mathematics, introducing a new concept on the blackboard. Students are asked to complete a workbook exercise that includes a couple of story problems requiring reading comprehension and reasoning. The teacher and student peers help Tom figure out how to begin the calculations. Tom is initially stumped on the story problems. He takes longer than most students learning to read carefully and then figuring out what problem is to be solved. He gives up and begins to talk with other children a couple of times. Tom and another child do not return their full attention to the workbook exercise and do not master solving the problems. The teacher observes that Tom and his friend are not attentive to their math lesson and makes a note for the after school teacher aide to complete this assignment with Tom and his friend.

Getting Tom out of bed, fed and off to school is overseen by parents. The teacher observed and reacted to Tom's learning. When he faltered the teacher at first assisted him. When that assistance was not sufficient, the teacher arranged an additional resource, a teacher aide. Thus, coproducing education services was a joint effort by Tom, his teacher and his parents. To be successful, Tom must have sufficient motivation for learning prescribed lessons, to give attention during class sessions, attempt to understand new materials and complete assignments. His

teacher must take actions to help *each child* in the learning process, observe learning-related behaviors of *each child* in class and mobilize outside classroom resources that may include teacher aides, specialty teachers, other students, parents and community.

More generally, the teacher, Tom and his parents are *reciprocally interdependent* and exercise discretion in the course of their *mutual adjustments* as they *coproduce* education services. Boundaries between the classroom, the school, the school district and their task environments are open, with continuous adjustments to meet constraints and contingencies at the student/ teacher nexus (Thompson; Parks, et.al., Whitaker).

We can think more broadly than the vignette when considering how students, teachers and families work together at the student/teacher nexus. Students, most importantly, must be motivated and have sufficient ability to master the subject being offered. Almost as important is encouragement and support from a student's family, although many students succeed in spite of indifferent or negative attitudes toward educational achievement from parents. The influence of student peers and the immediate community are likewise important and negative attitudes from peers or the community create hurdles to student achievement. A teacher's skills in coproducing education services are derived from a mix of their own motivation and mood, their ability to motivate and engage their students and their ability to act upon direct observations of each student. Teachers add to these personal skills specialized and general knowledge learned through teaching experience, university training and directives set by schools, school boards, State boards of education and Federal mandates. Resources contributed by of parents and family support are at least as numerous as those of students and teachers. Specific family circumstances may impact coproducing differently from one year to the next. Family status – e.g., single-parent, two-earner, one-child, large-family – impacts the coproduction of education services in spite of expectations associated with social, economic and ethnic values.

## **II. CHALLENGES IN COPRODUCING AND ADMINISTERING**

We opened this paper with the core technology for education services as our initial unit of analysis. We are now in a position to examine some of the adaptations effective organizations and other institutions should make to meet the contingencies inherent in that core technology (Donaldson). In this section we discuss six of the more obvious challenges specific to coordinating and administering education services.

### **Coordinating at the Student/Teacher Nexus**

The first challenge is the most oblivious. When you begin an analysis with full recognition that education services are coproduced at the student/teacher nexus, your focus shifts to the interactions between students, teachers and parents. How can these interactions be coordinated more effectively? Hierarchy, control, accountability and economies of scale will still be considered, but *after* the problems of coordinating these interactions have been addressed (Thompson, pp. 51-65).

The student/teacher nexus spans the boundary between organization and task environment. Ergo, administrators and teachers do not control at least half of the participants in this intensive/coproduction technology. Both sides of the reciprocal interdependence between student and teacher are intrinsically involved in coproduction. (Not all intensive technologies are coproduced but all coproduced services are intensive technologies.) The boundaries of the organizations involved with coproduced technologies are permeable. One half of the nexus, teachers, are in the focal organization; the other half, students, are in its task environment. Important resources involved in the coproduction process are outside the boundaries of the focal organization and not subject to purchase or market exchanges. Some of the contributors to the coproduction process report to officials in the school, school district or providers of funding; others do not.

Authorities may issue orders via the superior/subordinate relationships inherent in their hierarchies but they apply primarily to the teachers in the student/teacher nexus. And even that superior/subordinate relationship is mitigated by collegiality norms in the teaching professions. It may be argued that students are controlled by conditionally permitting continued enrollment in the school, codes of conduct and grades. These sanctions are important, to be sure, but they apply primarily to students motivated to learn. Many students, who teachers or schools may desperately try to retain, drop out. And how appropriate is it to threaten a first grader with expulsion and/or bad grades? Few parents or elementary school teachers would advocate such heavy-handed measures. Therefore, we search for alternative means to motivate or gain compliance from students and teachers. Perhaps more systematic attention should be given to schemes that may to instill an intrinsic love of learning, *e.g.*, a gold star on the forehead, mentoring parents in the skills of coproducing, motivational teams comprised of variations among teachers, parents, students and community leaders.

### **Education Services via the Third Sector?**

This paper is presented at the Third Sector Study Group sessions at the EGPA and it is appropriate to consider coproducing education services using the principles of the Social Economy.

Monzon and Chaves carefully defined the concept of Social Economy or the Third Sector as it is used in Europe. The schools coproducing education services fit some, but not all, of the seven “principles” in the Charter of Principles of the Social Economy. It could easily be argued, however, that many schools are moving toward organizing themselves much closer to these seven principles. Even the more traditionally-organized schools emphasize “the primacy of the individual and the social objective over capital,” “the combination of the interests of members/users and/or the general interest” and that “most of the surpluses are used in pursuit of sustainable development objectives, services of interest to members or the general interest.” Most schools remain under the direct jurisdiction of public authorities or large, organized religions and do not have “voluntary and open membership,” “democratic control by

membership,” “the defence and application of the principle of solidarity and responsibility and responsibility” and “autonomous management and independence from public authorities.”

There are two substantial trends in the coproduction of education services in the United States where Social Economy principles are more widely used. Several million American students are “home schooled” each year. The student/teacher nexus is located almost completely within the family. Regulations and requirements for school attendance and achievement by home schoolers vary considerably among the fifty states. In many of the states, home schooling families are allocated public funds on a per pupil basis to purchase textbooks, computers, internet subscriptions and educationally-related extra-curricular activities. Groups of like-minded families typically self-organize into loose associations to share pedagogical ideas and to organize such activities as sports and science fairs. Home schooled students are usually required to take the annual standardized grade-level tests in math, language arts and science administered by state authorities.

Charter schools represent a second trend toward what Europeans see as the Third Sector. They are private not-for-profit and for-profit schools chartered and substantially funded by public school districts. They are institutionally diverse, ranging from parent cooperatives to private for-profits. A few would meet all the principles of the Charter of Social Economy, with the exception of “autonomous management and independence from public authorities.” In practice many charter schools approach “autonomous management” concerning some of the more contentious issues, such as teacher credentials, teacher tenure and student admissions. They remain subject to regulations concerning racial and ethnic bias, student attendance and annual standardized testing.

For at least three important reasons, education services lend themselves to coproduction through Third Sector institutions. First, they are considered social or merit wants (Musgrave, p. 9-15) in most countries, i.e., they have both private goods and public goods attributes. The public goods attributes are considered so important that most of the funding is provided by the public sector in advanced countries and almost all developing countries. Second, the practical result of coproducing through an intensive technology is that essential contributors to the coproduction process are outside the formal institution of the school. The inclusive and participative norms of the Third Sector are congenial to the support of these processes of coproduction. Third, accountability of students and teachers does not fit fully into the frameworks of either markets or governments. Participants in coproduction processes and consumers of the private and public aspects of education services need a wider range of options than opportunities to choose and/or exit a school, as a market would provide. Choices offered voter/parents/students via democratic institutions are too blunt and too few. More fine-grained and nuanced feedback and accountability is needed than is possible in periodic elections. Again, the participative, self-governing norms of Third Sector institutions may accommodate more immediate and continuous feedback and accountability during the processes of coproduction.

## A Mandate for All to Learn

The models of administration that dominate schools and school districts are based on assumptions that education services can be *produced and delivered* by schools. Our analysis of the core technology demonstrates such models *should be less effective*. But schools have been using such models for decades. Why did education administration get along for so many years without more systematically confronting the realities of coproduction?<sup>2</sup> The answer is astonishingly straight-forward. The fundamental strategy underlying the coproducing of education services has been to provide students an *Opportunity to Learn*. This strategy turns out to provide a clever rationalization for selecting students who are skilled and motivated and for dropping unskilled and unmotivated students. In this way educators sidestepped many of the problems associated with the student half of the student/teacher nexus. If a student fails to learn, it is their problem. He or she has been given an opportunity. Teachers and schools have fulfilled their obligation, even if many students fail or drop out.

A personal story illustrates just how dramatically the strategy of *Opportunity to Learn* simplifies the coordination and administration of education services. I had not thought seriously how being organized to give students an *Opportunity to Learn* is built into a university's infrastructure until a faculty colleague abruptly resigned a couple of years ago. The School of Management needed a quick substitute to teach Political Economy 100X, a lower division general education class. I was shocked by how unmotivated, disinterested and/or unprepared many lower division students are. A class with an enrollment of 60 students rarely had more than 40 students physically in attendance. Those physically present often paid little attention to the classroom discussion. Students in the back seats surfed the web via the campus wireless network. One young woman always grabbed the same front row seat and promptly dropped off the sleep. And she was not the only student sleeping through the class period.

What did I do with students who did not attend class, complete assignments and/or failed examinations? I flunked them. My colleagues were proud of me for showing backbone in the fight against grade inflation. I was not expected to seek out and assist unmotivated, non-attending students. Students motivated to take advantage of their *Opportunity to Learn* but having troubles understanding were treated differently however. I gave them compensatory assignments, handed back heavily edited assignments with instructions to resubmit, and did one-on-one tutorials in my office. Infrastructure in the university as a whole was much the same. Writing centers, math tutors, study groups and counselors were offered to motivated but struggling students. But few resources were available to help the unmotivated, lazy and/or disinterested student.

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<sup>2</sup> Donaldson gives two conditions under which an organization may avoid effective adaptations to their technology. A firm may be dominant in its industry and thereby powerful enough to forego cost-cutting adaptations. Or there may be slack in the productive capacity of the firm or industry (Donaldson, p. 132). Under *Opportunity to Learn* it may be argued both of these conditions were satisfied.

Under UAF's basic strategy of providing an *Opportunity to Learn*, then, many thorny problems in coordinating and administering the coproduction of education could be safely disregarded. If a student is not motivated to contribute as a coproducer, it is the student's problem. Issues related to student motivation, study habits, intellectual abilities, prerequisite preparation and living expenses are given inconsistent, incomplete and inadequate attention. University resources focus on faculty and students who are motivated and skilled in the processes of coproduction.

If, however, there is a mandate that all (or almost all) students achieve at least baseline levels of academic competence, a school cannot disregard the coproductive contributions of students and their families. Returning to my experience as university faculty, a mandate that all (or almost all) students must demonstrate basic competence, let's call that a strategy of *Universal Competence*, would have substantially changed my relationship with my Economics 100X students. When students did not show up for class, a shrug of my shoulders and disapproving click of the tongue would clearly not have been sufficient. I would have been obligated to keep a careful daily roll of who was attending, followed-up on those not showing up, enforced a code of in-class conduct that proscribed sleeping and internet surfing, and developed routines that would have insured completion of course assignments. I would have also expected the School of Management and the University of Alaska Fairbanks to support me in these new responsibilities. Student behavior outside classes would have to be regulated to enforce individual study behaviors. Such changes in my responsibilities to students and the supporting institutional structures of the university would be considered radical reforms by university faculty, administrators and students.

In fact, an expectation that all (or almost all) students will learn at least baseline levels of knowledge in language arts, mathematics and science emerged in most developed countries during the last half of the 20<sup>th</sup> century. Prior to World War II it was assumed in the U.S., at least officially, that every American had an *Opportunity to Learn* but he or she was expected to put forward the necessary effort, *i.e.*, be involved in coproducing their own education services. The reality was that many citizens of color and/or in poverty were not provided a fair and equal opportunity to learn. With the emergence, first, of the Civil Rights movement and, second, Lyndon Johnson's Great Society there was an incremental but steady shift from a strategy of *Opportunity to Learn* a strategy of *Universal Competence*. Significantly, the most recent Federal legislation addressing this issue is the No Child Left Behind Act of 2001 (NCLB). This legislation mandates that *all students* will be achieving at grade level by 2014 in language arts, mathematics and science. With a mandate that all students learn, there is no way schools can continue to avoid taking coproduction into account as they have done under the strategy of *Opportunity to Learn*.

Admirable as it may be to mandate that 100% of students demonstrate baseline competence in basic academic subjects, it is as a practical matter impossible to achieve. Such a mandate assumes that every single student will have the skills and/or motivation to participate effectively

in coproducing of education services. Given the thousands of possible reasons why a student may or may not be motivated or skillful in learning basic academic skills, an expectation that 100% of students will routinely demonstrate grade-level competence in a list of academic subjects is, to my mind at least, impossible. There are differing capabilities among teachers and students to participate in coproduction. Some teachers have abilities to inspire and motivate students. Others are dull, inarticulate (even if good scholars), insist on rigid and/or inappropriate pedagogical methods. Variations in the skills of coproduction are equally great among students and their families. Families and students of higher socio-economic status are more skilled in the arts of coproduction than families with little or no experience with higher education. Students from families of recent immigrants or with transient living patterns are disproportionately represented in the statistics of under achievement. These patterns are well known and sometimes taken into account. The challenge is to integrate them systematically into the coordinating processes at student/teacher nexus.

Compounding this unrealizable mandate of *Universal Competence*, the NCLB act makes teachers and schools fully responsible for student performance. A careful application of the concepts of intensive technology and coproduction makes it clear, first, that students, families and communities cannot, by legislative fiat, be absolved of their role in coproducing education services; second, if you are going to intervene to improve student performance, efforts must focus on affecting what happens on both sides of the student/teacher nexus.

Even to achieve substantial improvements under a strategy of *Universal Competence* will require schools to organize in a very different way. Schools must adapt to work more effectively with all coproducers. School districts may, for example, intervene to compensate for any lack students and families may have in their abilities and motivations to coproduce education services. Approaching this well-recognized phenomena from a coproduction perspective helps in choosing among alternative interventions to improve the skills of students, parents and communities in coproduction.

Two final points should be made about consequences, unintended or perhaps unacknowledged, of pursuing a “pure strategy” of *Universal Competence* as is currently the case under the NCLB in the U.S. First, the marginal cost per student will climb ever more sharply as a school district increases the proportion of students performing at grade-level. It will be more and more challenging to motivate students who are uninterested, ill-prepared and/or unskilled at coproducing. Ultimately no amount of resources can compel the last few unwilling students. Second, programs and resources available for the more motivated, gifted and/or skilled coproducers will be increasingly squeezed as resources are targeted on the final groups of non-performing students.

## Adjusting Structures to Strategy

Structural contingency theory suggests that an organization is *more effective* when its structure takes into account the specific interdependencies inherent in its core technology (Donaldson). In this case that calls for designing coordinating structures that match the strategic objectives, *i.e.*, strategy and structure should be considered together (Chandler). Matching strategy with coordinating structures has been routinely ignored in educational administration. A glaring case in point followed the imposition of a sweeping new strategic objective on U.S. schools by the No Child Left Behind Act (NCLB) of 2001.

For the school's technical core to meet the mandates of *Universal Competence* institutional arrangements surrounding the student/teacher nexus must satisfy at least two conditions. First, student and teacher must be in proximity to each other. (Daft; Porter, 1976) Education services are coproduced through processes that require continuing mutual adjustments among students and teachers. The teacher customizes the lesson to the current state of a student's ability and motivation. Second, the teacher must be able to mobilize resources appropriate to support highly individualized coproduction processes. Most fundamentally, schools and school districts *should* coordinate the institutions and actors surrounding the teacher/student nexus to achieve bounded rationality.<sup>3</sup> Within classrooms (boundary-spanning units) that are open to a diverse and changeable student/parent population (complex, heterogeneous and shifting task environments), teachers and students coproduce education services using an intensive, reciprocally interdependent technology. The sheer volume of relevant information that should be considered on each student, in every class room, to achieve *Universal Competence*, makes it extremely unlikely the mutual adjustments inherent in coproducing education services can be effectively initiated and coordinated except by classroom teachers. Only by coordinating through localized, conditionally-autonomous units will schools hope to approach the mandate of *Universal Competence* (Porter).

My observations, based on my own teaching experiences discussed above, are consistent with the maxim in business strategy that major changes in strategy should be accompanied by reforms in organization structures. Alfred D. Chandler wrote, in what has become a classic, *Strategy and Structure* (1964), an historical analysis of four major American corporations as they changed their basic strategies and organizational structures between 1920 and 1950. He identified a pattern of basic changes in strategy being followed by major adjustments in organizational structure. The changes in organizational structure roughly matched the needs for information and decisions called for in the new strategy. Chandler called the organizational structure that emerged the multiple division form, replacing a unitary/functional form.

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<sup>3</sup> "Our basic assumption is that structure is a fundamental vehicle by which organizations achieve bounded rationality. By delimiting responsibilities, control over resources, and other matters, organizations provide their participating members with boundaries within which efficiency may be expected" (Thompson, p. 54).

Surprisingly, the implementation of the mandates for *Universal Competence* and standardized testing in NCLB superficially correspond with basic elements of the multiple division organization structure. The three key elements of a multiple division design are, first, activities must be divisible into relatively independent bundles of activities. Second, central headquarters has powers of oversight and discipline over the performance of the constituent divisions and is supported by an analytic staff. And third, there are summary statistics that make possible interdivisional comparisons for purposes of evaluating the performance of each division. Major innovations facilitating the success of the multiple division form were, in fact, developing summary performance measures and a corporate-level analytic capability to collect and refine these data. Uniform systems of financial accounting emerged and with them reliable summary statistics – e.g., profit, return on investment, market share – to evaluate performance of otherwise highly decentralized, semi-autonomous, divisions. Each division managed its internal affairs to meet its competition and market conditions but was held to corporation-wide standards for profit, return on investment and market share.

From the Federal perspective, the regime of standards-based assessment and oversight mandated by NCLB substantially satisfies the three basic requirements for a multiple division organization design. States and school districts are assumed to be decentralized, semi-autonomous divisions. Analysts in the U.S. Department of Education support the Office of the Secretary in overseeing and disciplining States and school districts that may or may not meet *Annual Yearly Progress* targets. Scores on standardized tests are used as general summary statistics in the evaluation of the performance of States and school districts as profits and return on investment are used to evaluate the divisions of a business corporation. In this manner the U.S. Office of Education holds States and school districts accountable for outcomes on standardized tests while at the same time leaving to States and school districts the responsibilities to devise effective local strategies.

There are serious shortcomings, however, with the assumptions required to adapt this organization strategy to overseeing the implementation of the mandates of the NCLB. The institutions involved in delivering education services cannot be parsed into bundles of decentralized, semi-autonomous responsibility in anything analogous to a division in a corporation. Our analysis of the core technology used in coproducing education services highlights interdependencies among students, teachers and parents that preclude assigning responsibility for performance exclusively to anyone one of them. Further, as we discuss below, scores on standardized tests are not as robust a summary statistic as profits for purposes of evaluations and comparisons of performance by students, teachers, schools and school districts.

### **Vouchers and Choice**

Education is a favorite example of a mixed good, by which it is meant that the student/teacher nexus simultaneously coproduces private goods – students and their families appropriate the returns on “investments” in human capital, and public goods – universal literacy and an informed

citizenry. Education services are, thus, both jointly produced and jointly consumed. This compounds the complexity of coordination and administration. Half of the student/teacher nexus is outside the boundaries of a focal organization and the outputs of coproduction are consumed and evaluated by a mix of immediate, local and general consumers. And to make matters more confused, funds to support coproduction processes come from taxpayers who are not in direct contact with the student/teacher nexus. Dancing to the tunes of so many different bands requires dexterity on the part of students, teachers and education administrators. Not surprisingly schools have oscillated between satisfying their public and their private consumers. When public goods interests were ascendant children attended schools based on where they lived; attendance was compulsory; curriculums offered few choices. When private interests dominated, parents/students had more choices via vouchers, charter schools and home schooling.

Coproducing the private aspects of education services simultaneously coproduces a valued public good – reading skills and universal literacy; history and citizenship; mathematics and arithmetic literacy (Lindblom, p. 94). Other private aspects education services are not as easily matched with an intended public goods aspect, giving rise to *conflicts of preferences*. A couple of examples. Mandating that American students study advanced science and mathematics, to enhance the global competitiveness of the U.S. workforce, is resisted by students (and families) desiring to study other subjects or not wanting to tackle such difficult subjects. Public policies mandating equality, diversity and nondiscrimination often were not compatible with private preferences for attending a neighborhood school.

Advocates of vouchers and choice focus their attentions on the demand side of the student/teacher nexus. Emphasizing choice for parents and students downplays needs of teachers and schools, assuming teachers and schools will rally to restore enrollments if students move to other schools. Such a result, however, is only one of many possible adjustments. In Hirschman's case of a *lazy monopolist* the teachers and school may be relieved to be rid of those students and parents demanding higher performance as they could then settle back to a less disturbed mediocrity (Hirschman, p. 59). More likely, or perhaps in addition, a school will experience a decreasing capability to retain students because student contributions to the coproduction nexus degrades as the more motivated students and families leave a school. Teacher and administrator associations, on the other hand, often focus on making life easier for their side of nexus – higher pay, better working conditions, in-service training for teachers and expanded administrative discretion. The needs and motivations of both teachers and students must be nurtured.

### **Accountability: Who? For What?**

Accountability may be the most difficult and complex “specific challenge.” I will merely open the discussion in this paper this large and multi-faceted subject.

The basics of accountability are, first, to specify a desired objective and, second, to achieve that objective with the least resource inputs (Thompson, 83-98). The intensive, coproducing technology of education services, however, is characterized by goal ambivalence (and ambiguity) and uncertain knowledge of the cause/effect relationships among resource inputs as they are combined. That is to say, even if we could decide what we wanted to do we would not know with precision how to do it.

This sounds grimmer than it ought. A great many activities undertaken by people in and out of organizations share these characteristics. One consequence is that you must use indicators of effectiveness, not efficiency, for evaluation. Are fewer students dropping out before graduation? How many graduates go on to attend universities? Which universities?

Evaluations of business firms finesse this kind of problem with a sleight of hand. No matter how ambiguous their goals, no matter how uncertain the technology, if the firm is profitable it is considered effective. It is considered even more effective if it is more profitable than it was last year and/or more profitable than competitors.

A similar logic has recently been tried to evaluate coproduction in education. Student scores on standardized tests can be compared among students, classrooms, schools, school districts, states/provinces and countries. High performers and low performers can be identified.

So far so good. But many problems lurk behind facile comparisons, even more problems than basing evaluations of business firms on their relative profitability. Few, if any, firms maximize profits, but as a wag observed: "Profit is not the most important thing in business, but it's far ahead of whatever is in second place." This tortured bit of logic is true in most instances. Profit is measured in money. More profit is more money. Money is a general claim on resources. Money can be used to obtain an almost infinite variety of valued positions, properties, goods, services and companions. Test scores, however, do not share these second order characteristics with profits. Test scores are not legal tender; they cannot be transformed later into general claims on resources. The logic supporting the use of test scores as a summary indicator of effectiveness rests on the assumption that, irrespective of all difficulties and uncertainties, if students achieve satisfactory results on standardized tests a teacher, school or school district has been effective. So far so good, but . . . if scores are not satisfactory, who do you hold accountable? Education services are coproduced at the student/teacher nexus; goals are ambiguous; the core technology is uncertain. If we use test scores as a functional equivalent for profits in our schemes for accountability, someone must be identified to take the fall. The other side of the same coin: Who do you give credit if test scores are satisfactory? The teachers? The principals and superintendent? What about the students? Or the parents? Years of research on determinants of success by students gives the lion's share of the credit to the socio-economic status of the families. So, who do we hold "accountable" if students do not achieve satisfactory scores on standardized tests?

### **Concluding Statement: The Core Technology as the Initial Unit of Analysis**

I have been laboring in public policy and public administration for more than four decades and I always come back to the same problem. How can we (or how do we) achieve important public purposes through complex, non-hierarchical, multi-institutional settings? I take comfort in the knowledge that more experienced and skilled scholars than I are having as much trouble getting past this problem. Charles E. Lindblom was for a couple of decades the most widely cited scholar in public administration. In what may be his final book he wrote that the market system is the system for creating private wealth but that it falls short in sorting out non-economic priorities and effectively allocating resources to fulfill these priorities (Lindblom). Elinor Ostrom focused more than four decades of scholarship somewhat more modestly on problems of effective allocations and coordination in local governments and of properties held in common. She and her colleagues often begin by identifying cases where a common property resource is utilized in a sustained, equitable and effective manner. It has been difficult, however, to move from findings about these cases to a general strategy for advising on how to achieve public purposes effectively.

This paper is closer to Ostrom's orientation than Lindblom's in that it focuses on where policies are implemented, leaving for later issues related to how policies may have been decided. Using the core technology as the initial unit of analysis frames the analysis around coordinating to get the intended job done, a practical much more than an ideological focus. The core technology for education services is centered on the student/teacher nexus, with coproductive contributions necessary from both sides. Education services are not coproduced within a school or any other single organization; consumer producers (students, families and many others) contribute vital resources that are neither controlled nor purchased by schools or any other public or private organization. Models of administration rooted primarily in bureaucracy and organizations will be much less effective than models of coordination and administration that take the realities of the student/teacher nexus into account. Too many reform efforts restrict their analyses to one side of the nexus, often with the unintended consequence of discouraging contributions to coproducing from the other side. The net result is too often a decline in overall effectiveness.

Coproductive technologies in general, and the core technology for education services in particular, are not congenial to mandates for universal coverage. Yet, with the centrality of ever increasing bodies of specialized knowledge to the societies in developed countries, policies mandating a strategy of *Universal Competence* in a growing list of basic academic subjects are emerging. The NCLB act in the US may be the most extreme with its mandate that all children will be achieving at grade-level by 2014. The justifications for these mandates include arguments in support of insuring that all children, irrespective of ethnicity and the wealth and educational background of their parents, will have opportunities in the careers and industries of the 21<sup>st</sup> century. National leaders wring their hands about projected shortages of highly-trained citizens to staff high technology industries. Many problems are emerging with efforts to

implement these mandates. The NCLB act is among the most controversial pieces of recent Federal legislation.

Our analysis of the core technology highlights that many of the implementation problems are rooted in a failure to recognize that education services are coproduced. Mandates to achieve *Universal Competence* are not only impractical and unrealistic, they cannot put full responsibility for achieving the mandate on teachers and schools. Under a strategy of *Opportunity to Learn* teachers and schools could rationalize failures by many students by pointing out they did not take advantage of the opportunity provided. Such justifications do not work under a strategy of *Universal Competence*. Not all families and students are motivated and/or skilled in coproducing education services. Close attention must now be given to motivating all students and improving their coproducing skills. But, marginal costs per pupil rise sharply as higher percentages of students achieve academic competence. These rising costs must be covered by increasing revenues (taxes) or by squeezing out programs for motivated and gifted students. So far, in the US, too few new revenues have accompanied the mandate for Universal Competence and many programs for motivated students have been reduced or cut.

Finally, at least for this paper, beginning at the student/teacher nexus focuses attention on all of the institutions and processes involved in coproducing education services. Students, teachers, families, communities and political leaders coordinate their activities for many reasons. The formulas of markets and democracies provide inadequate and incomplete explanations for the numerous and continuous mutual adjustments underlying successful, or unsuccessful, coproduction. Investigating why and how these mutual adjustments keep occurring, across so many different cultures and countries, will go a long way to coming up with suggestions on how to improve the effectiveness of individual schools and communities.

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