

Chapter VIII

Models of the School as Organization

En los países desarrollados y en las experiencias exitosas de la llamada industrialización tardía en otras latitudes, existe un claro reconocimiento del carácter central que tienen la educación y la producción del conocimiento en el proceso de desarrollo, y en los países de la región esta actitud se ha extendido progresivamente. La difusión de valores, la dimensión ética y los comportamientos propios de la moderna ciudadanía, así como la generación de capacidades y destrezas indispensables para la competitividad internacional (crecientemente basada en el progreso técnico) reciben un aporte decisivo de la educación y de la producción del conocimiento en una sociedad. La reforma del sistema de producción y difusión del conocimiento es, entonces, un instrumento crucial para enfrentar tanto el desafío en el plano interno, que es la ciudadanía, como el desafío en el plano externo, que es la competitividad. CEPAL, *Educación y conocimiento: eje de la transformación productiva con equidad*, Santiago, 1992.

Systems of schools overseen or governed by ministries of education are the dominant form of instruction around the world. This chapter discusses various perspectives or theories on how schools should be organized. Although the illustrative examples are about primary and secondary schools, the logic of the analysis can be applied equally well to universities and other tertiary-level institutions. The analysis applies equally well to privately governed schools and to schools run by other government agencies (such as the military) or by corporations.

As an organization, a school is defined by its primary purpose, the provision of instruction that results in learning. Terms such as music school, or school of the arts, or elementary school refer to the content of what is to be learned. Despite the simplicity of their definition, schools have a clear identity that is remarkable in human history. Schools have existed for about 6000 years old (dating at least from Sumerian times—see Chapter II), and today abound in all countries of the world.

What we call schools receive “students” who are placed in distinct groups according to certain of their characteristics; they are located in a particular place, usually in a building known as “the school”; they have a fixed daily and weekly schedule and specified activities governed by regulations and rules. Instruction is provided by designated individuals (teachers) who are assigned responsibility for carrying out the process of instruction. Governance is hierarchical, with some policies made by national authorities, others by regional or local officials. Local operation is the responsibility of an on-site administrator (headmaster or headmistress, director, principal), an inspector or supervisor, or a district director or superintendent. Some schools have only one teacher and may have only one classroom; some handle several shifts of students per day. Schools vary widely in size, from a handful of students to thousands. Some schools may even be “virtual,” (or “distant”) that is, carry out instruction without direct contact between instructors and students.

The variety, persistence and ubiquity of schools as instructional organizations are the motivation for this chapter. Why are they so popular? Why do they vary in their organization? What form(s) of organization contribute most to learning? What form(s) of organization would be most effective in today’s social, economic and political contexts?

The Approach of this Chapter

We begin by asking why we give most importance to schools for the provision of instruction and not some other organization.¹ Schools are not our only option; there are

other effective ways for people to learn. Families provide instruction: children are taught spoken language and sometimes reading, and other skills useful in adult life. Teachers can and do provide instruction without working in a school; tutoring is an old and respected profession. Many adults learn on their own, that is, engage in self-instruction without going to school. If we have books and libraries why do we have schools? If a families want to educate their children, why not (allow them to) do it on their own? Or, why not hire tutors or individual teachers? What is it that schools (can) do that cannot be done as efficiently or as effectively by other organizations?

The issue that concerns us here is not why governments everywhere have sought to control (and not just provide) instruction. That is an important question we take up later. But at this point we want to ask, what makes the school superior to other kinds of organizations for the provision of instruction?

Business Metaphors as a Source of Perspectives About Schools

Here are three statements about the process of instruction and its results.

--Instruction is like agriculture: the farmer tills the soil, plants the seed, cultivates and waters and fertilizes; the seed grows and matures and produces its fruit as intended by nature.

--Instruction is like pottery making: the potter mixes the clay, molds it into the desired shape, applies a glaze and fires it in the kiln. Or, instruction is like manufacturing: the worker combines raw materials and transforms them into the finished product.

--Instruction is like a dialogue in which the comments of one person fire the imagination of another, whose comments in turn stimulate the thinking of the first.

The three statements are metaphors for the processes of instruction and learning. Metaphors are popular in human communication because their imagery reduces the complexity of reality making it easier to understand. By reducing reality to a few elements, they enable us to extrapolate from one complex phenomenon to others, we can generalize from the facts we have experienced in one situation to many other situations not yet experienced. If the generalizations turn out to be correct, the metaphor is kept and used again. As a result of this repeated use metaphors are often confused (or taken for) the reality they describe and can they can blind us to important variations across situations.

The most commonly used perspective for instruction is related to the metaphor that likens learning to a production process. Most proposals for the organization of systems of instruction and schools have germinated from knowledge about manufacturing; they are the offspring of the discipline of economics and the practice of business management, rather than progeny of psychology or the profession and practice of education. It is these proposals that most have influenced government policy for and public opinion about education. The other two metaphors also spawned explanations of learning and proposals for school organization but have not (yet, perhaps) yielded much fruit.

Ironically, the design of schools was (and continues to be) heavily influenced by knowledge and ideas from fields not directly concerned with instruction and learning. Although psychology has yielded a large number of theories of learning, and proposals for curriculum and teacher training, until recently psychologists had little to say about

how schools should be organized. Changes may be in the wind, however. For example, our language is now being shaped by metaphors generated by research on the brain and advances in computers. These in turn may affect how we think and talk about schools as organizations.

Perspectives that See the School
as an Organization for Production of Learning

The Industrial Revolution brought with it new interpretations of the production metaphor, first in economic theory and business practice and then in policies for the organization of schools. Each new interpretation has complemented, rather than radically replaced, a previous understanding of the business firm, and the school. For our purposes we group these interpretations in two major categories.

The first and earliest was based on a set of assumptions about the function (or objective) of business firms and the economic laws of the market that determine their success. Firms were assumed to have as their objective the maximization of profit and access to the information necessary for rational decisions. Firms fail if they do not follow economic law. We can come to learn those laws, therefore, by studying the organization of successful firms. The knowledge obtained in this way tells us how all firms ought be organized in order to carry out their basic function. The facts we obtain through descriptive research on existing firms are said to be “positive” or true. The knowledge they represent is declarative and can be codified and transmitted to others.

The second perspective has evolved over time, prompted by evidence that some of the assumptions of the positivist approach do not conform to reality. Some successful firms were seen to pursue more than one objective (for example, welfare of employees in addition to profit-making). Instead of responding to unseen but inexorable forces of the market, firms were guided by decisions of their members that changed market conditions. Firms to some extent made their own history rather than conformed to external forces. Understanding of how best to organize a firm was seen not as a discovery of unchanging laws but as a successful construction of new realities. The new knowledge is said to be “constructivist” rather than “positivist.” It is procedural rather than declarative, and its codification and transmission is difficult because it is based on action.

Both perspectives emphasize that production is greater when it is carried out by groups of persons whose activities are coordinated and integrated. For example, although we can learn alone, learning is faster with the assistance of an instructor who provides knowledge and methods of learning. In addition, cooperation in production can greatly increase the total amount of product (or learning) that can be achieved in a given amount of time and with a given amount of resources. Individual students in groups can each learn almost as much from a single instructor as if each were receiving individual tutoring. Groups of specialized instructors can teach a much broader scope of material than can a single instructor at little additional cost of resources (building, equipment). The division of labor in activities makes it possible to produce more at less cost (that is, to be more efficient). Factories and schools are an efficient form of organization for mass production.

Great Britain was one of the last industrial nations to create a system of public instruction. Prior to that time the Church and charitable organizations provided schooling for the poor in limited facilities with few teachers. Joseph Lancaster and Andrew Bell developed a system by which older and more knowledgeable students instructed by the teacher in

turn instructed other students. This method, which Lancaster brought to South America, characterized public education for some time.

Cooperation is not easy when individuals pursue their own objectives or operate with differing understandings of the task. The new factory and the modern school overcame these difficulties by the introduction of hierarchical authority that regulated cooperation. The system of instruction that was developed was designed to send orders in one direction and receive requests and reports of achievement in the other direction. These were vertical systems, as were all other large-scale organizations of the day. We now present three different proposals for how to organize to enhance cooperation. The first emphasizes the importance of allocation and use of resources.

The School as a Site for the Transformation of Resources

In the 18th century, rulers of the new nation-states sought to increase the number of persons who, through instruction, would be loyal (and competent) citizens of the nation-state. The function assigned to schools was to increase (or maximize) the number of persons receiving instruction. Learning (of prescribed content) would follow. Production of instructed persons would grow with increased supply of (external) resources for instruction. The major issue facing the national government (and eventually its ministry of public instruction) was therefore the provision and allocation of resources for instruction.

Schools were assumed to require a common set of resources, as a function of the number of students to be served. Originally resources were sites, teachers, curriculum and textbooks. (Other elements, for example, blackboards, were added later.) As had been shown in industry, resources could be made to produce more by establishing standards for the organization of the school as an instructional site. National regulations specified the size of schools, ratio of students to teachers, content of curriculum matched to age-based grades, and content and organization of textbooks. School directors were appointed to administer the allocation of resources. Inspectors from the central administration insured application of the curriculum by teachers and student mastery of the content.

The new organization was more effective and could provide instruction for many more children than by teaching by tutors or at home. Training of teachers increases coverage of content to be learned. Grading of students by age makes it easier to maintain discipline and student attention. Mass production and use of textbooks increases exposure to prescribed content. Small, independent schools cannot serve as many students as a public system, and they are less likely to be located in small towns and rural areas. Enrollments in public schools eventually eclipsed that in all other organizations for instruction.

Supply of external resources for instruction was the major preoccupation of systems of instruction. This concern is expressed today in claims that not enough is being spent on instruction, that schools lack modern equipment and technology, and that we should hire more teachers in order to reduce class size. Failure to achieve objectives (enrollment rates, graduation rates) is explained in terms of insufficient resources.

Management Practices

Almost all countries of the world have a national ministry of education, responsible for the administration of schools, to which the ministry allocates resources. Uniform standards permit central planning of school construction and training and hiring of teachers. Most countries of the world have some kind of multi-year plan for their national system of instruction. These plans forecast enrollment growth and calculate the

new resources that will have to be provided to meet the expanded number of students. Countries that link their education plan with economic plans base projections of enrollments on forecasts of the demand for workers with different levels of instruction and kinds of skills. This approach, called manpower planning or human resource planning in the 20th century, is the modern equivalent of the school organization designed to provide mass instruction in the 18th and 19th centuries. As in business, the successful system of instruction is that which can command and apply the most resources.

Discouraged by the slowness of centrally managed efforts to provide access to primary schools, the Government of Indonesia decided to allow community groups to contract local contractors. In many cases, communities mobilized local labor and construction materials, reducing costs. In several years the program built more than enough schools to enroll all children, even in isolated areas. A follow up study showed that many of the schools were poorly built and that some funds had been misappropriated. On the other hand, universal access had been provided at less cost per school than when the central government built the schools.

The role of central management in this approach is to insure the fulfillment of the plan. Schools must be built on time, teachers must be trained, hired and sent to their respective schools, books must be written, printed and delivered, and classes must be taught delivering prescribed content. After planning, management's primary role is supervision or monitoring. Each level of the system (ministry, region, school) has its responsibility; each level is supervised; and information about compliance and fulfillment flows upward to the central planners and managers.

School-level directors are charged with the assessment of resource requirements for the coming plan period—classrooms, teachers, instructional materials—and the transmission of information upward. Once resources are delivered, the directors monitor their use. The school director's role is administrative (seeing to the implementation of the plan for the school) rather than managerial (making decisions about objectives and how best to achieve them). Teachers are regarded as semi-skilled or skilled workers (see Chapter IV), trained by the system to carry out the curriculum. In most countries parents are obliged by law to send their children to school; they have no other formal involvement in the instructional process.

An annual census is the most common method used by central authorities to monitor schools. Data collected include enrollments; numbers of teachers and students; and physical space in the school. This information and estimates of population growth are used to project increased resource requirements. Data are adjusted on the basis of special requests received from school administrators and supervisors. School efficiency is estimated in terms of the flow of students through the cycle. In most countries data is slow with the result that cannot be used to anticipate resource deficiencies.

Quality and Production Function Analysis

Meanwhile, most countries have achieved or neared achievement of universal primary enrollment. Reduced spending on construction of new schools has freed some resources for improvement of instruction per se. Policy concerns have shifted from expansion of quantity of instruction to the improvement of its quality.

"Quality" is a popular word in the business world, and consequently has many definitions. Most definitions compare the product to expectations for it. For example, the European organization for industrial quality, ISO, says that quality is "the totality of characteristics of an entity that bear on its ability to satisfy stated or implied needs." The American Society for Quality offers this definition: "Quality denotes an excellence in goods and services,

especially to the degree they conform to requirements and satisfy customers.” In short, “Quality is fitness for use.”

There are many definitions of quality in education as well. For our purposes, the quality of instruction is reflected in its efficiency in producing learning, that is, in the amount of instruction required to produce a given unit of learning. As discussed in Chapter II, learning is difficult to observe reliably. As a consequence we have not yet reached a common understanding of what we should observe, and measurement of learning is controversial.

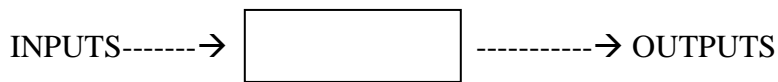
At the center of the controversy is current reliance on measures of certain kinds of knowledge and skills to represent the result of instruction. Scores on cognitive tests (primarily of mathematics, language and science) have come to be treated as measures of learning (although in fact they are summary measures of knowledge and ability—see Chapter II). Today most systems of instruction use national standardized achievement tests as a proxy measure of how much learning has been produced by the system. Schools can be compared on average scores or on pass rates of their students.

The popularity of this proxy for a measure of learning is its ease of use in statistical analysis. The most common statistical approach explains an outcome variable (for example, achievement test scores) in terms of a combination of input variables. The approach is often called production function analysis because it was originally used in industry to identify the combination of resources that would maximize production. The general equation looks like this:

$$Y = f(T, S, M, x\dots) + u$$

where Y is the product (for example, achievement scores), T refers to teachers, S to students, M to materials, and so on, and *u* is all other unaccounted-for factors. Each of the terms can be expressed in quantitative form, for example as simple quantities (number of graduates, teachers, etc.), or variable characteristics (for example, percentage of qualified teachers, average years of teacher training, teacher salaries, textbooks per student, and so on).

The relationship also can be expressed graphically, in its simplest form as an input-output model:



In the production function model, only Inputs and Outputs are measured; their connection is mediated by a “black box,” but this is not measured. In other words, no analysis is done on processes within the school organization. Conclusions drawn from the analysis are assumed to apply to all schools as if the conditions under which they were generated were all the same.

This analytical approach has stimulated a great deal of research and has made significant contributions to our understanding of the performance of schools. The following is a brief sample of the many input factors that have been included in production function research:

- a. Students as individuals
 - 1) Innate ability (e.g., measures of aptitude, IQ)
 - 2) Prior instruction (pre-school)

- 3) Prior learning (marks in classroom, earlier scores on an achievement test)
 - 4) Current health, nutritional status
 - 5) Proxies for prior learning in the family (parents' education, occupation, income level, quality of housing)
 - 6) Proxies for effect of community (urban/rural residence)
- b. Teacher
- 1) Intelligence (e.g., vocabulary)
 - 2) Prior instruction (years of schooling)
 - 3) Prior training (pre-service, as a teacher, specialization)
 - 4) Proxies for ability (salary, years of experience)
- c. Classroom
- 1) Students per teacher, class size
 - 2) Physical facilities (space, furniture, equipment)
 - 3) Instructional aids (books, other)
- d. Principal
- 1) Prior instruction
 - 2) Prior experience
- e. School
- 1) Size (number of students, number of classrooms)
 - 2) Expenditure per pupil
 - 3) Physical condition of building (electricity, windows, toilets)
 - 4) Shifts or sessions per day

Each of these variables can be influenced by (centrally-determined) policies that affect the allocation and distribution of centrally controlled resources or inputs.

Production function research both has advanced our understanding of the resources that impact learning, and has demonstrated our ignorance. If we could identify all the factors that determine learning outcomes (whether defined as enrollment rates, graduation rates, or achievement scores) we would be able to explain all the variation in scores among individual students, schools or nations. The u or error term in our equation would have a value of 0. In practice, however, we can explain about half of the total variation. That is, about half of the factors that determine learning are unknown.

Furthermore, almost all studies show that the Student factor (and especially family background) is the largest single determinant of learning outcomes. Put baldly, what students already know when they come to school has a bigger impact on measures of achievement than what happens in school. Factors that can be directly affected by national school policies, such as teacher qualifications or class size, are less important (although not insignificant) in their effect on learning. In other words, even when we measure learning of what schools teach, out of school experiences have more effect on learning than does what happens in school. To complicate the issue even further, results vary from country to country and from researcher to researcher. Factors correlated with outputs in one study turn out to be not important in others. As a consequence, we are not yet able to predict reliably the (size of the) effect of policies on student learning.

There are three conclusions that could be drawn from evidence suggesting that schools have only a minor effect on learning. One position is that the school is an ineffective organization for instruction that should be abandoned. Another position

argues that the current organization of schools, as centers for production, limits the possible effectiveness of school instruction; the school should be reformed. A third position questions the evidence, arguing that production function analysis leaves out factors that, if included, would demonstrate that the school is in fact an effective center for instruction.²

Summary

The Production Site model for school organization assumes a universal package of resources for instruction that includes: teachers; classroom; curriculum and instructional materials; and students. The model presumes that there is an optimum ratio among resources (e.g., students per teacher) that can be known through experience and that is uniform across schools. The amount of instruction that can be offered increases directly with increases in resources. Future demands for resources, and therefore future production of instruction can be forecast knowing population growth in the area that supplies students to the school. Schools should be allowed to grow in size so long as there is unmet demand for enrollment. Local administrators should be encouraged to signal resource requirements and utilize them according to specification. Teachers should be trained and certified as capable of fulfilling the official curriculum. The effectiveness of a school is estimated by the ratio of students completing the cycle to students beginning the cycle.

The School as a Nexus of Contracts for Production of Learning

Production function analysis has been applied in business even longer than in education, with similar findings. Not all firms generate the same amount of profit even when they use the same amount of resources. Firms vary in their efficiency, or how much it takes them to produce a given amount of product. Analysis of the contribution of inputs explains only a portion of total product and gives us an incomplete understanding of production.

This conclusion stimulated the development of an alternative explanation for productivity, focusing on the contribution made by workers within the firm. The productive advantage of firms, it was argued, is directly related to the level of cooperation among participants and coordination of their specialized activities. Improving cooperation increases efficiency and therefore profits, but cooperation requires that all workers do their job.

Large organizations attempt to secure cooperation, and therefore efficiency in production, by specification of the rights and obligations of the various groups of participants. In exchange for compensation, employees agree to carry out specific tasks under the authority of management. The problem is, not all workers live up to the terms of their contracts. Some may not understand the objectives or details of the contract. Others may not wish to honor their obligations and do not work as they should.

What steps can organizations take to improve compliance with contracts? Corporations use two methods, monitoring of employee performance, and incentives for good performance. One form of monitoring is quality control in which “quality” is defined as absence of defect or fault. Products are examined at each stage of production to insure they meet minimal acceptable standards. Incentives may be linked directly to units of production, as when workers are paid for each piece produced, or to some quota or target. Both approaches increase costs to the firm; they are efficient only if the result is even greater production.

Systems of instruction face similar problems of contract compliance. The original factory schools built in supervision to insure compliance with the curriculum. Over time, expanding enrollments and dispersion of schools have made frequent supervision too costly. In many countries today schools may receive only one supervisory visit a year. As directors also are ignored by the center they often form alliances with teachers. As a consequence, implementation of the official program is spotty. Central ministry officials and politicians complain that low levels of student learning are the result of teacher absenteeism and reduced time on instruction. Their argument is that only by increasing teacher compliance with their contracts can the quality of schooling be improved.

Despite public expectations, school graduates are not a standardized product. In Latin America, for example, half of grade 6 students are unable to read and understand the meaning of a front-page story in a daily newspaper. In some industrialized countries, some high school graduates are unable to write a simple business letter or to solve a simple algebraic equation. About one-third of graduates can locate their own country on a map of the world. Employers find it necessary to provide training in basic communication skills before putting graduates to work. This is taken as evidence that teachers are not teaching the official curriculum.

In an effort to increase teacher compliance with their contracts, systems of instruction have adopted two new models of school organization. One shifts the location of decisions about resource allocation downward in the hierarchy. This deconcentration of authority is intended increase supervision of the behavior of teachers and directors. The second model offers incentives intended to increase attendance and effort of school staff, resulting in more work.

Locating Supervision Closer to the School

In small countries and in urban areas, monitoring of teachers and administrators is easy. In large countries with widely dispersed populations supervision is harder (and becomes prohibitively expensive). The problem is exacerbated when countries faced with resource constraints and dispersed populations choose to expand enrollments and numbers of teachers rather than supervisory staff. Teacher attendance may decline as a result along with compliance with the official curriculum and school calendar. Teachers may be more likely to deviate from the official curriculum content and use less effective methods.

In response to reports of managerial corruption and low worker productivity, corporation owners moved management closer to the worksite. Local administrators were given more authority for resource allocation and other stakeholders were empowered to hold them accountable. The equivalent reform in systems of instruction has been decentralization of governance. Authority for decisions can be shifted to regional administrative offices; regional councils; and local school councils or boards. All include non-school staff in an advisory or decision-making role. Regional and then local communities are involved initially in decisions about school construction and furnishings; some later are given authority for annual budget making within prescribed categories. Administrators are allowed to purchase resources locally or to mobilize labor and materials from the local community. In some countries councils have been give authority to hire and fire school personnel. The objective is to increase information about and control over the work of teachers.

During 10 years of civil war El Salvador lost about one-third of its public school teachers. After signing a peace treaty with the rebels, the government was eager to re-open schools, especially in isolated rural communities. The ministry

negotiated with the national teachers' union to allow local communities to hire and fire teachers. In exchange for losing job security, teachers would receive pay increments and opportunities for promotion. Local communities were to form councils of parents of school age children, who would receive grants to hire teachers. The school councils assume responsibility for equipping and managing the schools, and for hiring and firing teachers.

In this model, the ministry of education no longer must directly supervise the thousands of schools in its system. Instead of the direct management exercised in the factory model, the ministry relies on delegated representatives to monitor the behavior of local directors and teachers. The major concern is to increase compliance by local schools with the official program. Regional and local councils take over the management functions earlier exercised from the national capital. This may include contracting and assignment of personnel, and financial auditing. School directors continue as administrators but also are expected to organize and act as chairperson of the school council. Parents participate in decision-making as council members, but otherwise their involvement in school affairs does not increase. The important indicators of success are increased access, attendance, and completion rates.

When they have been introduced as a means to weaken teacher organizations, decentralization reforms have been resisted and often have failed. On the other hand, when decentralization has increased teacher control over schools, implementation has more often been successful. In general, however, decentralization has made little contribution to improvement of student learning.

Rewarding Employees for High Performance

The use of incentives is intended to align employees' objectives with those of the owners, thereby reducing the costs of cooperation and increasing efficiency. The employer offers rewards to those workers who meet announced production targets. The introduction of incentives increases the ability of central management to control the activities of employees (increasing production). The value of the reward is linked to the value-added (increased value of production) of the employee.

Some systems of instruction have attempted to raise levels of teacher performance by offering rewards for higher performance. Incentives can be attached to teacher behavior (teacher attendance, classroom teaching, in-service training and further academic education) or student behavior (attendance, graduation, achievement test scores). In some systems teachers are rewarded on the basis of student and parent evaluations of their teaching. Chapter X provides a more detailed examination of these policies and their effects.

"Pay for performance" was used to control teacher behavior prior to the creation of national systems of instruction. In the 13th century professors at the University of Bologna were hired directly by students. Teacher salaries in England in the early 18th century were based on students' test scores in the basic subjects.

Implementation of the policy requires a capacity to measure individual teacher performance. Average class scores on student achievement tests are perhaps the most common measure, given their low cost and relatively high reliability. The use of these scores is justified as follows. Learning is a "value added" concept. In systems of instruction, "learning" is demonstrated by gains in scores on tests of student achievement (demonstrated knowledge and skills). If we assume that the content of school instruction is unique and not taught elsewhere, scores on achievement tests (based on the curriculum) are reasonable estimates of learning of the curriculum.

The effectiveness of teachers can then be estimated by comparing students' examination scores. Rewards can be given to teachers whose students' scores exceed the average or expected level, and sanctions to those teachers whose students' scores fall below expectations. Teachers will work harder to improve their performance and gain the reward. A fundamental assumption of incentive policies is that the benefit from gains in learning (from increased work by teachers and directors) will be greater than the cost of the incentives. As it is often impossible to assign a value to learning, however, decisions about how much to spend on incentives usually are based on assumptions about how much is necessary to motivate changes in behavior.

Teachers can be rewarded for performance in various ways. Some plans offer incentives for performance to individual teachers, others reward schools. Following experience in industry, the most frequent incentive that has been used in systems of instruction has been financial (increased base salary; bonus pay; promotion to a higher rank). Some systems have provided high performing teachers with opportunities for further training or education; others have relied on special recognition of high performing teachers.

Incentive policies have the effect of reducing and standardizing the scope of what is taught in classrooms. Motivated by incentives, directors and teachers focus more closely on the official program. Their emphasis, however, is on those aspects of the program included in the evaluation scheme. In effect, teachers "teach to the test", which covers only a portion of the total program. The same effect is produced, without the expense of incentives, when the system introduces "exit" examinations that determine whether a student will graduate and receive a diploma. Parents and students pressure the school to insure graduation by narrowing instruction to cover only what appears on the examination.

The role of the school director, in systems with incentive policies, differs according to whether rewards are to individual teachers, or for the school. In the latter case, directors may become curriculum managers, organizing groups of teachers to re-design their instruction to raise student performance on examinations. Directors are more likely to assume this role if the policy includes some direct incentive for the director, for example, greater prestige, more resources, and higher salary.

Incentive policies pressure teachers to act as skilled workers, shaping their activities to produce specific kinds of learning outcomes. If teachers understand the importance of time on task, they may seek greater collaboration with parents in order to increase student time on learning at home.

Summary

The definition of a school as a "nexus of contracts" draws attention to the importance of staff effort in producing learning. Effort at the school level (i.e., fulfillment of the contract by the worker) can be raised (by the central ministry) in two ways: closer monitoring of director and teacher work; and incentives for improved performance.

The first approach—decentralization of governance—seeks to increase ministry control over what happens in schools. Monitoring by ministry supervisors is expensive and implies certain risks. An alternative is to involve stakeholders who are directly affected when school staff members do not fulfill their responsibilities. Local councils act as representatives of the ministry. Without being paid, they will actively scrutinize the work of directors and teachers to insure compliance with ministry regulations.

Implementation of this policy results in improved teacher and student attendance and reduced student failure.

A second method does not require shifting authority downward in the hierarchy. The central ministry offers schools and staff members rewards for increased effort. Implementation of this policy requires reliable and relatively inexpensive methods for measuring school and teacher performance. This can be done by direct observation of teachers in classrooms; evaluations of teachers by students and parents; and assessment of learning using student achievement scores as a proxy. If scores on assessment measures improve, the policy is said to have been successful.

The School as a Producer of Resources

Human understanding advances by constructing mental models and testing them against reality. Initially contrary facts are ignored or adjustments are made in the model to accommodate them. As the volume of contradictions increases, however, the model loses its credibility. Because this shift in thinking is a function of experiences, it is uneven across individuals. Some persons continue to find a given model convincing even though others have constructed another that can account for more of the facts.

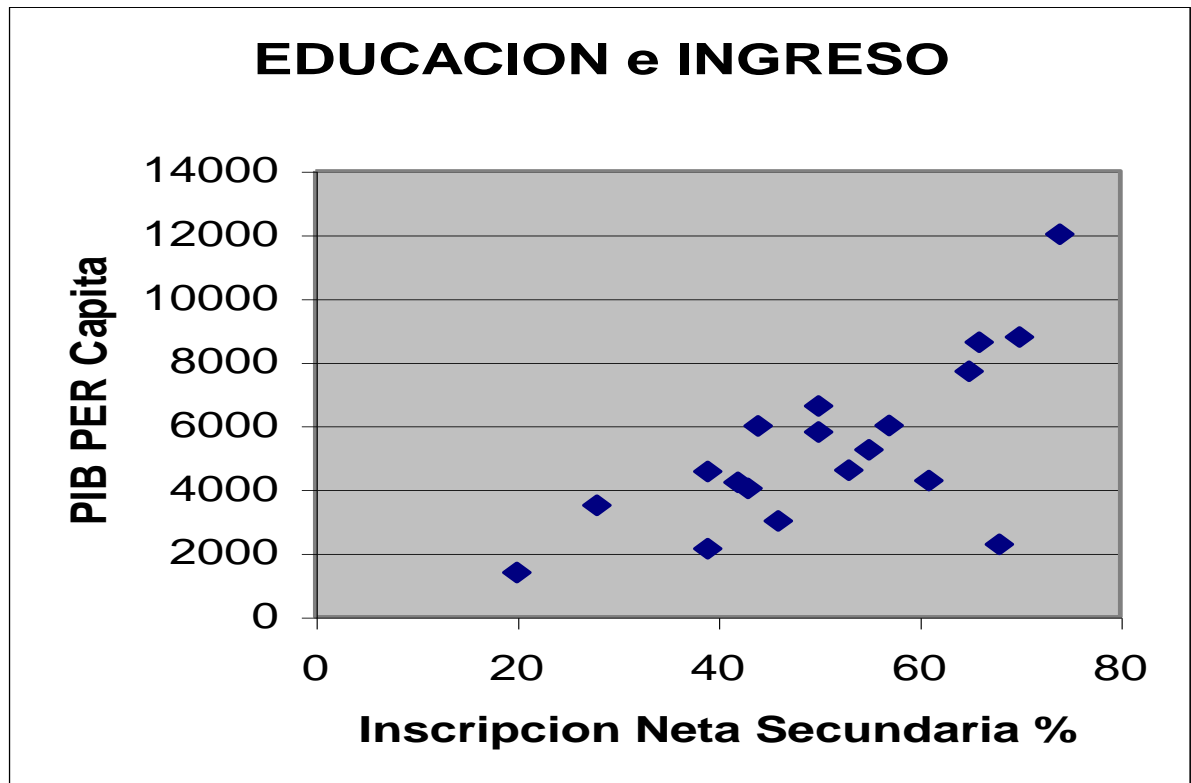
National economic performance prior to the middle of the 20th century was explained primarily in terms of resource endowments. Some countries prospered more than others because of their control over access to the sea, favorable climate, rich mineral deposits, and other material resources. Evidence was accumulating, however, that not all richly endowed countries prospered, and that some with hardly any natural resources had achieved high levels of economic growth.

Improved information made it possible to compare the economic growth of nations over time and to identify factors associated with higher rates of growth. A distinguishing feature of those countries with few natural resources that had high rates of economic growth was the high level of schooling attained by their population. Resource poor countries with high growth rates had a larger proportion of their population enrolled in and graduating from school.

In the mid-1840s Argentina and the United States had about the same population and the same level of national income. There was, however, considerable variation among the level of development of the various North American states. Those in the north, and especially Massachusetts, enjoyed a much higher standard of living than those in the south. Domingo Sarmiento, later to become president of Argentina, set out to explain these differences. The states in the south and mid-west had much more arable land. The mid-western states also had rich deposits of coal and iron, and navigable rivers. As slave-holding states, the south had an abundant cheap labor supply. Massachusetts had a cold climate, rocky soil, few mineral deposits, and no slaves. After eliminating all other possible explanations, Sarmiento concluded that Massachusetts led the other North American states because of the high levels of education of its population.

Shortly after the mid 20th century economists began to refer to the presumed and desired product of schooling as human capital, defined as the knowledge and cognitive skills that contribute to economic productivity. There is no doubt that a person's schooling is valued by society: a person's income level is moderately linked with their years of instruction, with those with more education receiving higher income. In addition, some studies show that persons with more education produce more. Gross Domestic Product (or GDP, a measure of the value of annual economic activity) per person of a country is highly linked to average years of instruction of the country's labor force (see Figure 8.1).

Figure 8.1.
GDP Per Capita and Net Enrollment in Secondary
For 19 Countries in Latin America



The Internal Resources of a Corporation

The introduction of the concept of human capital sparked the development of a new model to explain corporate performance. Analysts had noted that some firms regularly outperform (have higher productivity and profits than) others even though they are equivalent in access to external resources and level of worker effort. This led to the inference that the productivity of an organization depends not just on its supply of physical resources but also on its capabilities. These capabilities include the competencies or skills of each person in the organization, their relationships with each other, and relationships with their external environment (for example, in the case of a business, suppliers and clients).

New employees bring some required competencies with them, as a result of human capital formation through schooling. For example, school instruction provides fundamental knowledge and analytic skills used in many social and work settings. Communication skills, for example, contribute to ability to cooperate within the firm and with clients. The more traditional the firm, and the simpler its technology of production, the more likely it is that learning outcomes will match required worker competencies.

In a competitive market, however, firms seek to distinguish themselves by developing unique capabilities and competencies. To do this they provide training that complements and supplements learning from school instruction. New employees are

targeted for training designed to introduce them to the culture of the firm. Training provides skills and knowledge required for the firm's unique technology of production, and values that increase cooperation.

Cooperation is maximized when workers understand how their activities and those of their colleagues contribute to the final product. This understanding is not automatic, however. Productive processes require procedural rather than declarative knowledge and skills. Efficiency increases as the required behaviors become routine or habitual, and the knowledge they embody becomes tacit or difficult to communicate to others. In other words, the effort to achieve high productivity through specialization reduces workers' understanding of relationships within the organization and with clients. Training limited to knowledge and skill development of individual workers constrains organizational performance.

In order to overcome the drawbacks or costs of worker specialization, managers developed a new model of production associated with concepts of team production, total quality management, and knowledge management. The so-called Japanese model of production places workers into teams responsible for deciding how best to meet a particular production target. Teams typically divide tasks so as to minimize boredom and fatigue, and to match workers' skills with specific tasks. Teams typically achieve higher levels of productivity than do the same number of workers on assembly lines. Morale is higher and wastage is lower.

The total quality management approach emphasizes that every activity in the business cycle, from design to production to marketing and sales contributes to productivity. Raising quality across the board increases profit and improved cooperation results in increased quality. This approach seeks to involve every member of the firm in improvement of their contribution to total quality.

The concept "knowledge management" has been used in various ways but often is understood as the process through which organizations generate value from their intellectual and knowledge-based assets. The concern is to identify the knowledge that individual members of the firm have accumulated through their work, and to make that knowledge available to others in the firm.

The Internal Resources of Schools

Some schools have levels of student achievement much higher (or lower) than would be predicted from knowledge of the condition of the buildings, qualifications of teachers, and even the family background of the students. This makes sense if we assume that the effectiveness of schools depends in part on internal resources.

The price of a finished product usually should be more than that of the raw materials used to make it. The difference in price is known as the value added by the production process. If students graduate from a school with no more learning than they had when they entered, the value added by the school is 0. Suppose we compare two schools, one that enrolls mostly students from low-income families with another that enrolls mostly students from wealthy families. In most cases, we would expect that on entering students in the first school would have lower achievement scores than students in the wealthy school. We would recognize that this difference was the result of differences between family experiences and not because of the schools.

Now suppose that at the end of a year we measured achievement again, and found that average achievement scores increased in both schools, but by the same amount. We should conclude that there is no difference in value added between the two schools. That is, they were equally effective even though students in the wealthy school still had higher achievement scores than students in poorer schools.

These internal resources are the contents of the “black box” in the Input-Output model of production. They include the competencies of teachers, working individually and working together, the competencies of school directors and other staff, and non-tangible aspects of school operation variously labeled as school tradition, culture or climate. Teacher competencies are their knowledge of curriculum content, their instructional practices, and their ability to maximize time spent on instruction. Directors increase teacher time on instruction by supplying resources on time, setting standards for and maintaining student discipline, and providing (opportunities for) teacher training. School traditions, culture and climate that encourage positive teacher and student attitudes toward learning increase time spent on task.

The factors that distinguish effective from non-effective schools often are developed within schools rather than supplied by a ministry of education. They are developed when members of the school community work together to build shared objectives and methods to achieve them.

Approximately 25,000 rural primary schools in Colombia follow the program known as Escuela Nueva. The program emphasizes cooperative learning, in which students help each other to learn the curriculum. Instruction in the 1st grade is devoted to reading. Beginning in the 2nd grade students work in groups, carrying out tasks specified in a series of graded programmed workbooks.

Teachers worked cooperatively in the development of the workbooks. Individual teachers prepared “learning cards” that presented (curriculum-related) tasks that students could carry out individually or in small groups. Other teachers then tried the cards out with their students, assessing the extent to which the tasks were enjoyable, held students’ attention, and resulted in learning. Over time a number of tasks were designed and tested. These were then arranged in sequence by difficulty and content. Teachers visit the home of each pupil at the beginning of the year to determine skills and interests that can be demonstrated in the school. A large map of the community is painted on an outside wall of the school, and pupils and parents locate their houses on the map. School discipline is the responsibility of a student government.

This model of school organization requires a change in the relationship between the ministry of education and schools. In the Incentives model, in which the school is seen as a bundle of contracted workers, the ministry of education delegates authority to monitor compliance with regulations and measures outcomes. In the Internal Resources model, schools are given (limited) autonomy in management of their material resources and personnel. The ministry of education becomes a “ministry without schools”, responsible for broad policies but not activities, concerned for attainment of centrally determined objectives but not all the details of how they are achieved. The ministry shifts its priorities from administration to support and policy formulation. Statistics and research take on a greater importance and focus on identification of ways to assist individual schools to develop their own resources.

School directors in this model are responsible for mobilization and development of local resources. The director becomes a leader who must generate enthusiasm among the community of parents and teachers in support of the school, rather than an administrator of centrally provided resources and regulations.

Batahola Sur lies on the edge of Managua, Nicaragua, and is populated by migrants from rural districts. Most of the housing is self-constructed from scrap materials, as were the first classrooms constructed by the community. As the student population expanded, the community organized to attract funding from non-governmental organizations for construction of standard classrooms. The school now has 700 students, 5 classrooms and 23 teachers for two shifts of classes per day. Achievement levels are higher than

would be expected in these conditions. Parents participate actively in a variety of ways: labor and materials for school maintenance and furnishings; food and labor for the students' daily glass of milk; construction of instructional materials under teacher guidance; tutoring of students with learning problems; and the school council.

In the Incentives model, teachers are regarded as employees who must be offered rewards to get them to carry out their responsibilities. In the Internal Resources model, teachers are viewed as professionals who collaborate with others (including parents) in development of the school. Parents take an active part in the full range of school activities, including development of instructional materials and actual instruction together with teachers, and training programs for parents. The success of the school depends on its unique collection of resources.

Central authorities can follow the success of internal school development through standardized examinations of student achievement and periodic assessments of the school as an organization. The efficiency of a school can be assessed in terms of the amount of internal resources or assets that are mobilized in support of instructional objectives. The analysis of factors determining learning is broadened to include what administrators, teachers and students do, rather than just static characteristics. The prediction of learning outcomes is enhanced by inclusion of information about principal-teacher relations, teaching practices, student-teacher interactions, student-student interactions, and other behaviors that must be observed over a period of time.

Summary

This model emphasizes the importance of the internal resources of the school as a community of persons. The capabilities of the school to produce learning flow out of cooperation among members of the community in development and application of their competencies. Individual skills can be developed outside the school; effective cooperation can only be developed among the members themselves.

An effective community develops organically and incrementally, and requires leadership usually by a school director. All activities are oriented toward increased learning by students, defined in terms of official curriculum and external examinations. Directors, teachers and parents collaborate in production of instructional resources as well as activities that provide indirect support for the instructional process.

The School as a Learning Organization

The success of the three forms of business organization described above depends on the stability of the context (or market) in which they operate. Each of the models is based on the assumption that the factors that determine a company's profitability are knowable, known, and essentially unchanging. This assumption holds fairly well for products that have been made for years with no or only slight changes in design. Producers understand the materials required and where to obtain them, the technology of production is as improved as it can be, and systems of marketing and distribution have been perfected. Firms that make these familiar products compete primarily by reducing costs and by increasing their share of the market, with no fundamental changes in the product or its production and distribution.

In a stable society the three models of school organization assume that the function of schools is to re-produce in the young knowledge, skills and values already known to be important for society's maintenance and progress. Curriculum content (and consequently assessment of learning) is based on what already has been learned. Schools seek to become more effective producers of learning by more careful and complete

application of blueprints of organization, but the definition of what should be learned remains the same.

These assumptions no longer go unquestioned, however, in today's corporate world. The expansion and uneven inter-penetration of the societies of the world and their economies challenges the notion of a predictable future. Change is the order of the day, at a pace and with a complexity so great that to some it appears chaotic. The change involves every aspect of business—new products, new technologies of production, new methods of marketing and distribution. Many firms, including those with long histories, are unable or unwilling to change themselves and fail. Even as the world economy grows, business failure rates are high.

A prime cause of these failures, some say, is adherence to the old models of the firm based on fixed knowledge. The most successful organizations in today's context are those continuously changed by new knowledge. This new knowledge can be absorbed from the outside, and also generated internally. Corporations or firms are urged to re-design themselves as social learning systems in which the primary rationale for the firm's existence is the generation and diffusion of knowledge as well as its application. Efficiency now is to be achieved not by allocating resources according to known relationships between factors but instead by changing the relationships themselves. Firms prosper, it is claimed, by experimenting to see what they can make themselves be.

The old models do not ignore learning, of course. Firms improve by training staff to use known technologies to produce familiar products. In the new model, however, every aspect of the firm and its organization can be changed, including its fundamental mission or purpose and public identity as well as its products and the technologies to produce and distribute them. This change comes about not by choosing among an identified selection of alternatives, but rather by invention of new options through experimentation.

The firm is called upon to re-create itself; it is seen as a product of the activities of its members. It is a learning organization in which learning is a primary and continuous activity of all members, as individuals and especially in their relationships with each other, suppliers, clients and others. It is a learning organization to the extent that the diffusion of individual tacit knowledge among fellow workers shapes the firm's overall operation.

The transfer of what is primarily tacit knowledge is easier when members share language, culture and values with respect to the work of the firm. Through team building activities the firm seeks to develop and share explanations of the firm's purpose and operation. Extensive dialogue, using a variety of metaphors and other forms of figurative speech, is necessary for the collaborative group to be able to construct a "web of meaning" that makes sense out of individual differences. The values and experiences individuals share can be woven together to provide a new explanation of their collective endeavor. The firm is identified as a "community of practice", no longer just a place where people come to work, but a setting for establishing and reinforcing individual and collective identity.

Firms characterized by communities of practice make high use of internally generated tacit knowledge. They stand in contrast to firms that primarily use external, explicit knowledge. These latter firms work best with vertical command structures and

rely on conformity to expert-defined rules and procedures to obtain high productivity and quality control.

Corporate researchers state that explicit knowledge is only a fraction of the total stock of the knowledge on which a firm's success depends. Explicit knowledge can be observed directly by traditional measures of human capital (for example, levels of education and training of employees) and by structural capital measures, such as facts that can be stored in a database. Tacit knowledge can be estimated only by indirect measures such as prestige and reputation, or customer satisfaction.

The School as a Learning Organization

As a consequence of the speed and scope of advances in science and technology, what schools teach today may no longer be pertinent or even correct when students graduate. The overall quantity of human knowledge is growing exponentially and that knowledge is diffusing rapidly from its place of production around the world. The diffusion of knowledge, and skills and values, from one society to others stimulates, through thought and experimentation, new knowledge and skills and values in the receiving society. Because the future is not knowable, we cannot determine what people should be taught now in order to know what it will be important to know later.

From this perspective, the effectiveness of schools requires more than just an adequate supply of resources, teachers who comply with their responsibilities, and schools dedicated to improving their capability to carry out the official program. For a school to be effective, it has to provide learning that will be useful and relevant in a variety of contexts. The models reviewed so far ignore variations in contexts; curriculum is predetermined and fixed. In a changing world, however, fixed knowledge, skills and values gradually lose their relevance.

The pursuit of relevance in a society experiencing or seeking change requires a complex strategy. Systems of instruction have to provide three kinds of learning: the knowledge, skills and values required to operate what does not change; methods for learning what can and should be changed; and the capabilities and competencies to manage and integrate old with new structures and processes. Fortunately, this is a reasonable challenge for a system of instruction, as the pace of change is the product of our actions and not beyond our control.

Even radical change is incremental; the future is born out of the present. Much of the knowledge, values and skills of importance today will continue to be important in the future, for at least three related reasons.

- a. New knowledge is diffused slowly and unevenly across persons and nations. Only a small portion of the population lives primarily in the "new" age: most of us use a mix of "modern" and "traditional" knowledge, and a small portion survives using the same knowledge as did our ancestors.
- b. The expansion of knowledge is more additive than substitutive. Societal learning corrects some errors from the past but mostly adds to the overall fund of knowledge available to us. Much of what was learned in the past was correct and continues to be functional, even in the most technologically advanced countries of today. Some everyday knowledge persists unchanged across generations. For example, we communicate by computer but often write with pencils using vocabulary and grammar already in fashion hundreds of years ago.

- c. Some new knowledge and the changes that result from them are actively resisted and even suppressed when they threaten powerful groups in society. Knowledge may be neutral but can be used for destructive as well as constructive purposes. Given the inequality that exists in all societies change often benefits some groups to the detriment of others. As a consequence, not all possible changes will be implemented.

The learning organization model encourages production of new knowledge in response to context: its motto is schools that learn (as well as teach). This is an attractive but problematic notion. In a changing and unpredictable environment, organizations survive and prosper by changing objectives as well as methods to achieve their objectives. While diversity increases the likelihood that some group(s) in society will be able to respond positively to any future situation, in the short term the disparities in values and abilities of different groups are seen as inefficient and disturbing.

The optimization of the benefits of the learning organization—flexibility in response to unanticipated situations—requires encouragement of diversity by local institutions along with increased communication and linkages among local schools and with national institutions, a strategy of vertical and horizontal connection. Both objectives—diversity and integration—must be achieved or the strategy fails. By itself the pursuit of efficiency through increased diversity weakens the internal cohesion of an organization. Supervision and incentives are a temporary fix but over time they increase tensions within a group and lower whatever efficiency was gained by their use. Teamwork and group dialogue, on the other hand, take more time but in the long run they result in more effective, and more relevant, organizations.

Increased diversity among schools by itself reduces coherence in the overall system of instruction. Diversity alone increases inequality and reduces equity in the system (which lowers overall efficiency). These tendencies can be overcome by increased communication across schools, which share solutions to common problems stimulating innovations appropriate in the local context. In the vertical system models discussed earlier, regulations and new knowledge flow downward from the ministry of education; the learning organization model proposes a horizontal system in which the ministry diffuses innovations produced locally and codifies collaborative agreements worked out by schools. The ministry has two primary objectives: to insure that the diversity of the system of instruction matches the diversity of the society-in-progress; and to promote the coherence and integration of knowledge, skills and values produced locally.

Escuela Nueva developed as a highly innovative program through an organic process in which designers and teachers collaborated in the development of materials and activities to permit self-directed learning by students. The effort began without a definition of the final goal; this emerged through exchange of experiences among teachers. The teachers' suggestions were derived from experience rather than theory. Along the way a number of learning objectives and practices were tried out and many abandoned. A new theory, now recognized as "constructivist", was induced from both successes and failures. Although all of the objectives and practices incorporated in the final program were known in other parts of the world, their integration was a new activity for Colombia and the Ministry of Education.

The process by which this occurs can be called networking or dialogue (for example, of the kind used in the original *Escuela Nueva*). Networking allows schools to increase their technological knowledge not only through their own constrained research and development expenditures, but also by absorbing knowledge produced elsewhere.

Networking can include external partners in the process of sharing knowledge, such as universities, research centers or firms in other sectors. The inclusion of a source of “basic” knowledge changes the dynamic relationships among schools and increases the rate of innovations or new knowledge development. Knowledge flows not only among schools but also toward and from research centers. How much knowledge will be absorbed depends not only on the capability of the individual school, but also the degree of connectivity of the network, that is, how much all schools and other organizations are linked together.

Schools as learning organizations emphasize cooperation rather than competition. Students collaborate with each other and teachers in learning tasks. Teachers collaborate with each other and with parents and other community members. School directors, teachers and parents work together in the promotion of learning, both by individual students and by the school-as-community.

Each group improves their own special competencies but also linkages with the other group. The school director serves as coordinator of all these activities, much like the conductor of an orchestra. Teachers experiment with and learn improved classroom practices but also integrate them more closely with instructional practices of parents. Parents collaborate in support and instructional activities in the school but also take courses related to their parenting role. Students are encouraged to set their own learning objectives, individually and in teams.

Evaluation becomes a complex activity as well. The ministry of education may continue to assess performance of schools using standardized tests, allowing individual schools to set annual performance goals. Tests may be expanded to include a significant portion of items developed or chosen locally or regionally, to assess learning of locally specified content. Performance of students is assessed at the school level on the basis of work samples or “portfolios”, defined in negotiations between students and teachers. All evaluation is intended to inform the learning process; it is considered primarily formative, for purposes of improving the process. This requires that ministry, schools and teachers be able to link their activities and materials to specific outcomes.

The success of a learning organization is measured by gains or value added in both levels of learning and scope and diversity of learning.

Summary

There are two main reasons why the conventional business model is not appropriate for the organization of schools. First, business plans have a shorter “time horizon” than do those for schools. The business cycle, from conception to production to sale and delivery generally takes less than 3 years. As currently organized, school cycles from admission to graduation last 6 years in the case of primary and secondary instruction, and from 2 to 8 years in tertiary instruction. Technologies and hence the cognitive and motor skills requirements of occupations changes at a faster clip than does the content of teaching and learning.

Second, business products are used in predictable and unchanging ways. Instructed persons, on the other hand, are expected to continue to learn through their work, acquiring more knowledge, skills and values over the course of their life. The school as learning organization instructs not only in what is known, but also in methods of learning. This is accomplished by organization of the school as subject to change, in its objectives, structure, processes and outcomes. The major activity for bringing this about

is the continuous focusing of members of the school community on their activities and their results. Learning is a process of growth rather than achievement of a fixed target.

An alternative to the conventional business model emphasizes the product of the school as learning, both by individuals and the organization itself. Individual learning processes are assessed in reference to personal as well as to organizational goals. Learning by the organization is assessed against system-wide standards and targets set by the organization itself. The ministry of education encourages innovation and diversity within and across schools, but simultaneously seeks integration of the system by promotion of dialogue about innovations developed at the school level. Its goal is to optimize complexity and coherence. Local administrators mobilize their communities, teachers and parents, to participate actively in generation of innovations. Teachers are trained and encouraged to experiment with content and methods for instruction. The effectiveness of a school is estimated by the satisfaction of its stakeholders (staff, students, parents, local and national community) with its outcomes.

Comparison of the Models

Major differences and similarities between the models are summarized in Table 8.1. Most schools in public systems of instruction are organized according to the Production Function model, but several countries have begun to try out policies based on the Contracts and Resource-based models. Policies consistent with the Contracts model offer teachers financial incentives based on their practices or, more commonly, the achievement scores of their students; and sanction teachers for poor performance. Policies that allow public schools to operate with some autonomy from the official program are examples of the Resource-based model. Some reforms are intended to induce schools to compete with each other. Schools react to these policies as if they provided incentives (e.g., an opportunity to capture more resources linked with enrollments), or as if the policy allowed the school to develop unique programs, i.e., unique resources.

Private schools that are publicly financed typically are subject to the same constraints or incentives as public schools, and follow the same models of organization. Privately financed or independent schools can choose their model of organization and some follow the production function model. Many are organized to develop a unique identity that attracts a steady flow of applicants among whom are those with characteristics that match the instructional model of the school.

A very small number of schools are organized as learning organizations. Typically these are public or private schools with a close attachment to another institution that is itself committed to knowledge production, for example a university or research-based corporation. Some systems of public instruction designate some schools as “experimental” and encourage them to become learning organizations.

Most schools are organized as production centers not only because of the inertia of tradition, but also because that model of organization is easier to understand and administer. The “factory” school has been able to produce large numbers of reasonably well-prepared students at relatively low cost, and without threatening the existing distribution of wealth and privilege in society. For some kinds of learning outcomes, the production model of organization is seen as a reasonable option.

Paradoxically, attention to new models of organization is a result of the success of the factory model. The call for increased efficiency in public instruction is provoked less

by explicit failure of the system, and more by recognition that expanded demand for instruction (both for access, and by employers for higher levels of knowledge and skills) will cost a great deal more. The Contracts model seeks to increase efficiency by increasing outputs more than the related cost of inputs. The Resource-based model looks for new inputs at lower cost to the system of instruction. As the demand for instruction continues to rise, even more emphasis will be given to these models of organization.

The learning organization model is inherently appealing, but difficult to establish and maintain, especially in a large system. In addition, it is possible to reform systems of instruction, and to transform societies, without converting all organizations in the society into producers of knowledge. The societal competitiveness of which ECLAC writes in the quote at the beginning of this chapter requires a shift in emphasis rather than in essence. Even the most advanced societies depend on many traditional organizations to produce (or reproduce) the basic goods and services of the society, and to maintain the organizations that provide stability and freedom. On the other hand, these advanced societies give relatively more attention to learning and knowledge production than do those that are less developed.

Table 8.1
Summary of Four Models of School Organization

METAPHOR ELEMENTS	PRODUCTION FUNCTION	CONTRACTS	RESOURCE-BASED	LEARNING ORGANIZATION
PRINCIPAL CONCERN	How best to allocate given resources	How to get all personnel to meet their responsibilities	Development of unique resources and capabilities	Adaptation to a changing context
FACTORS THAT DETERMINE SUCCESS	Sufficient resources delivered on time	Personnel work at full capacity	Development of required competencies	Continuous improvement through experimentation
TASKS OF SYSTEM MANAGEMENT	Goal-setting; specification and delivery of required resources	Supervision and/or establishment of incentives and sanctions for personnel	Supply requested resources, detect and intervene in local failures	Detect and diffuse local innovations and maintain system integration
TASKS OF SCHOOL MANAGEMENT	Administer resources, implement regulations and plans	Supervision and administration of incentives	Mobilize local resources, encourage staff development and community	Organize learning community, encourage innovation, provide training
TASKS OF TEACHERS	Carry out curriculum and other regulations, act as Semi-skilled worker	Maximize effort and improve performance, act as Skilled worker	Improve teaching practice and collaborate with community, act as Semi-professional	Continuous experimentation with and improvement of instructional practices, act as Professional
ROLE OF PARENTS	Send children to school, comply with demands for cooperation	Participate in monitoring of teachers and school decision-making	Participate in all aspects of school including instruction	Collaborate with teachers in operation of autonomous school

Table 8.1 (cont.)
Summary of Four Models of School Organization

METAPHOR ELEMENTS	PRODUCTION FUNCTION	CONTRACTS	RESOURCE-BASED	LEARNING ORGANIZATION
RELATIONSHIP OF SCHOOLS WITH SYSTEM	All schools same, vertical authority	Autonomy in organization of instruction but conformity to uniform standards set by center	Autonomy in organization of instruction but conformity to uniform standards set by center	Linked with other schools and center in horizontal authority; share elements of common program.
KNOWLEDGE MANAGEMENT APPROACH	Input based	Quality control	Total quality management	Learning organization
OBJECTIVE	Maximization of number of students completing cycle	Maximization of student learning of prescribed content	Maximization of student learning of prescribed content	Maximization of desired potential for each student
EVALUATION OF STUDENTS	Teacher grades or individual examinations by visiting supervisors	Individual scores on national, standardized examination based on curriculum	Individual scores on national, standardized examination based on curriculum	Teacher assessment of student work, individually and in teams
EVALUATION OF SCHOOLS	Pass rates	Average student scores on national exam	Average student gain scores on national exam	Achievement of school-set objectives on national and local examinations

Summary

1. In modern societies schools under the direction of a national ministry of education or equivalent dominate as the primary source of instruction for youth, even though other kinds of organizations, such as families, churches, the military and businesses also instruct their members.
2. The efficiency of the school, like that of other organizations, results from individual workers carrying out specialized tasks. This division of labor requires cooperation and coordination.
3. Proposals for school organization have been strongly influenced by the metaphor of the school as a factory that produces learning. Three sets of policy have evolved based on the schooling as production metaphor.

4. The oldest and most common perspective is of the school as a site for the transformation of resources, in order to produce learning. Efficiency in this process of transformation is achieved through standardization of inputs, and detailed regulation and monitoring of the performance of workers.
5. The initial concern in all systems was to extend access to schooling to as many children as possible. Uniformization reduced unit costs and facilitated supervision. Planning focused on issues of quantity.
6. With growth and eventual universalization attention shifted to disparities in the performance or quality of individual schools. Initially, variations in learning across schools were explained in terms of differential access to resources. Production function analysis identified those factors that most contribute to production of learning.
7. The primary function of the school director is to administer school resources, including personnel, according to regulations. Teachers act as semi- or skilled workers implementing the plan. Parents have little or no involvement in the process of instruction. The school is evaluated in terms of its ability to carry students through the process of instruction.
8. As in business, performance of schools depends not just on access to and utilization of resources but also effort by workers. A second perspective argues that the efficiency of a school can be improved by increasing teacher fulfillment of contracts. Monitoring performance and offering incentives for compliance are two policy instruments that have been used.
9. Systems of instruction have sought to increase monitoring of schools by delegating authority to local stakeholders. Local school councils have been given varying degree of authority, sometimes including hiring and firing of teachers.
10. Some systems of instruction have offered financial incentives for improved student performance or compliance with the official program. Rewards have been assigned to individual teachers or to schools.
11. The primary function of the school director is coordination of stakeholders in the supervision of personnel. Teachers are regarded as skilled workers with contractual obligations. Parents are involved primarily in monitoring of the school's performance. The school is evaluated in terms of achievement of externally determined learning objectives.
12. A third perspective, linked with the concept of human capital, argues that it is the unique assets or resources of schools that lead to outstanding performance. Although some of these assets are physical the more important reside in the members of the organization. Efficiency depends on the capability of the organization to coordinate the work of its members. This capability in turn depends on competencies of individuals.
13. Schools, like business organizations, develop competencies and capabilities through in-house training but also through development of shared values and culture. Team production, total quality management and knowledge management are methods of asset development transferred from business to systems of instruction.
14. The primary function of the school director is mobilization of the school community in the development of resources for improvement. Teachers are expected to improve their own practices and to collaborate with parents in the development of materials

- and new practices. Parents are involved in instructional activities. The school is evaluated in terms of objectives it has set.
15. A more recent perspective on organizations emphasizes continuous change, in objectives as well as in methods. The primary task of the organization is learning understood as transformation of itself and not just provision of instruction to students.
 16. The school as learning organization responds not to fixed plans but to results of systematic scanning and anticipation of changes in its environment. Changes occur not just in methods of solving problems but also in objectives and therefore in what situations are defined as requiring action.
 17. Learning involves students and staff in a recursive cycles of decisions about objectives, problems, causes, alternative responses and capacities.
 18. The primary function of the school director is coordination of the involvement of the various stakeholders in the process of the school. Teachers are regarded as professionals in instruction. Parents are active participants in instruction and objective setting. The school is evaluated in terms of satisfaction of the various stakeholders (including the ministry) with its progress.
 19. The system of instruction of a complex society should be organized to match the level of diversity within the society. This requires encouraging high levels of diversity across schools (including in the type of organization they choose) while simultaneously monitoring and coordinating their learning products at the national level.

¹ A parallel question asked about the “firm” or business enterprise was a major contributor to the development of modern economics. See Ronald H. Coase (1937). “The Nature of the Firm”, *Economica* 4 386-405.

² For a detailed critical review of production function studies see Francois Leclerq, “The Relationship between Educational Expenditures and Outcomes”, Working Document DT/2005-05, DIAL, Paris, France. 61 pp. Available at http://www.dial.prd.fr/dial_publications/PDF/Doc_travail/2005-05.pdf.