

## Efficiency and equity in Learning Communities and schools

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**ABSTRACT:** Traditionally, school efficiency has been measured as a function of educational production. In the last two decades, however, studies in the economics of education have indicated that more is required to improve school efficiency: researchers must explore how significant changes in school organization affect the performance of at-risk students. In this paper we introduce Henry Levin's adoption of the X-efficiency approach to education and we describe the efficient and cost-effective characteristics of one Learning Communities Project School that significantly improved its student outcomes and enrollment numbers and reduced its absenteeism rate to zero. The organizational change that facilitated these improvements defined specific issues to address. Students' school success became the focus of the school project, which also offered specific incentives, selected teachers, involved parents and community members in decisions, and used the most efficient technologies and methods. This case analysis reveals new two elements—family training and community involvement—that were not explicit parts of Levin's adaptation. The case of the Antonio Machado Public School should attract the attention of both social scientists and policy makers.

**Keywords:** efficiency, equity, school organization, school drop out.

### *Eficiencia y equidad en las Comunidades de Aprendizaje y las escuelas*

**RESUMEN:** Tradicionalmente, la eficiencia de las escuelas se ha abordado desde funciones de producción educativa. Sin embargo, en los últimos veinte años algunos estudios del campo de la Economía de la educación han señalado que para la mejora de la eficiencia escolar es necesario ir más allá y explorar cómo determinados cambios organizativos en una escuela pueden afectar positivamente al rendimiento de los estudiantes más desaventajados. En este trabajo, introducimos cómo Henry Levin adoptó la perspectiva de la Eficiencia-X al mundo educativo y explicamos las características de alta eficiencia y de coste-efectividad de una escuela del Proyecto de Comunidades de Aprendizaje que mejoró substancialmente los resultados educativos de sus estudiantes, el número de matriculados y redujo la tasa de absentismo a casos puntuales. Estas mejoras se llevaron a cabo a través de un cambio organizativo centrado en algunos elementos como el establecimiento de un objetivo claro –poniendo el éxito educativo del alumnado en el centro del proyecto escolar–, incentivos motivacionales específicos, selección del profesorado, involucración de las familias y la comunidad en todas las decisiones del centro y el uso de las tecnologías o metodologías más eficientes. El análisis de este estudio de caso también nos demuestra cómo existen dos características que no quedan explícitas en la adaptación de Levin. Éstas son la formación de familiares y la involucración de la comunidad. El caso de la escuela

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pública Antonio Machado no puede pasar desapercibido por la comunidad científica ni por la Administración pública.

**Palabras clave:** eficiencia, equidad, organización escolar, fracaso escolar.

## INTRODUCTION

OECD data for 2006 show that in Spain the graduation rate for upper secondary schools was 72%, compared to the EU-19 average of 86%. They also show that completing upper secondary education reduces unemployment for those 20 to 24 years old by 7.4% and for those 25 to 29 by 6.8%. Moreover, a third-level qualification increases the likelihood that job seekers will find employment (OECD, 2008: 375).

This situation is accentuated in times of economic crisis when people who have not completed their secondary education must struggle even harder to find employment compared to those who have completed second- and third-level education. Moreover, over the course of their lifetimes, people with a good education have better chances of finding work, and they contribute more to the state through tax revenues.

Thus, investing adequately in education and promoting educational success should make our society more sustainable, efficient and equitable. In 1957, in *The Economics of Discrimination*, Gary Becker stated that better education for ethnic minorities would reduce inequalities in income and help bridge the gap between whites and blacks. But education alone is not enough, as Martin Carnoy (1996) points out. He argues that, in addition to differences in educational achievement, the gap in distribution of income grew during the 1980s and the disappearance of affirmative action programmes affected this relationship negatively.

In Spain, the school dropout rates among members of socially disadvantaged groups are high, especially among Roma students and students of immigrant background. For instance, Palaudàries and Serra (2009) found that 42,5% of students of immigrant background did not complete their compulsory secondary education. Thus, in order to avoid a two-tier society consisting of white middle-class workers and low-income minority workers, it is vital to reconceptualize educational policy and school organization.

Various studies have pointed out that educational inequality is related not to schools but to the student's family and social background (Coleman, 1966; Jencks, 1972). More recent research, however, shows that some schools may have significant effects on student achievement (Hanushek, 1986; Levin, 1997). These studies raise fundamental questions about efficiency and equity: to what extent do schools and family and social background work hand in hand, affecting both student outcomes and active citizenship?

This paper is structured as follows. First, we introduce what the literature on the economics of education says about efficiency and schools and describe how Henry M. Levin adapted the "X-efficiency" approach to education.

Then, we analyze the case study of Antonio Machado Public School, part of the Learning Communities Project, in Spain. Finally, we discuss how this project is related to X-efficiency and how it contributes to this theoretical framework.

### EFFICIENCY AND SCHOOLS

In the neoclassical economic approach to education, studies about improving school efficiency have traditionally focused on the *educational production function* (Murnane, 1975). This approach, focused on the allocation of various school resources and the positive impact that it can have on student performance, generated extensive critiques by various scholars who affirmed that teachers and schools differ dramatically in effectiveness; in addition, other studies found different results (Hanushek, 1986). Writers in this literature on the economics of education do agree on two assumptions about student academic improvement. The first assumption relates to teacher quality (Hanushek, 2002) and the second to dramatic organizational change (Levin, 1997).

Both assumptions are geared around the need to change the focus of educational policy related to student performance. In some countries, educational policy has focused on teacher quality as a way to improve educational outcomes. This misleading policy has been very popular; it has explicitly succeeded in reducing class sizes (thus raising costs) and in raising the level of teacher certification (thus reducing the supply of teachers). But extensive research has demonstrated that these actions, focused on teachers, do not have significant effects on student performance. In fact, according to Hanushek (2002), the quality of a teacher's work cannot be captured by traditional quantitative indicators such as qualifications and experience; he says that good teachers are "those who get large gains in student achievement for their classes; bad teachers are just the opposite" (Hanushek, 2002: 3).

In this sense, to improve school efficiency and equity it is important to look not only at the variations in student performance caused by changes in different educational inputs, but also to pay special attention to changes in school organization and to the culture that places student performance at the core of the school project. To do so, we evaluated the most prominent empirical literature on school efficiency and some educational practices such as the Accelerated Schools Project in the United States (Levin, 1997; Levin, 2005) and the Learning Communities Schools Project in Spain (Elboj et al., 2002).

### THE X-EFFICIENCY APPROACH

Henry M. Levin (1997) highlights the need to move from the traditional efficiency paradigm of the education production function to the X-efficiency approach in order to improve school productivity. Levin adopts Leibenstein's notion of X-efficiency: "in a great many instances the amount to be gained by

increasing allocative efficiency is trivial while the amount to be gained by increasing X-efficiency is frequently significant” (Leibenstein, 1966:413). Leibenstein observed that greater gains in efficiency are derived from dramatic organizational changes and that motivation and a clear objective may help to improve efficiency. Leibenstein named this change on effectiveness with the same or similar inputs as X-efficiency.

Schools working with disadvantaged minority students have traditionally emphasized remedial work, and been characterized by low expectations and low achievement outcomes. In these schools, the cost-benefit relationship is obvious. Most of them have high expenses for specialist remedial experts, but the return is low academic achievement and a low level of citizenship education. If we add in all the estimated future expenses for prisons, social support, unemployment and the loss of tax revenues, we can easily see that strong efforts are needed to change this inefficient situation.

In this sense, our society and schools are facing the challenge of promoting educational success for all. In doing so, according to Levin, the Accelerated Schools Project follows the X-efficiency approach. He states that schools may become more efficient and equal if they have five characteristics:

1. **A clear objective function with measurable outcomes.** To achieve efficiency all types of organizations need to establish clear objectives shared by all participants. As various scholars have pointed out, this clear aim should have measurable outcomes to determine whether schools are working in the right direction to achieve their objectives (Guba and Lincoln, 1989). For example, those schools aiming to transform public schools with high concentrations of at-risk students into organizations that will make all students capable by the end of elementary school and then sustain high levels of achievement through middle school. In this sense, “A school dream is established that will be transformed as a school destiny” (Levin, 1997:306).
2. **Incentives that are linked to objective success.** It has been clearly demonstrated that some inputs, such as adequate salaries, are relatively important for teacher performance and student achievement, especially in countries where teacher salaries are high. But significant and high positive effects on student performance are also demonstrated when the workers, community and students are satisfied, when they are committed to achieving a specific goal given their existing resources, and when they succeed at doing so (Levin, 1997). When each school community identifies specific goals—such as higher attendance rates, higher grades, more parental participation, a clear reduction in retention at grade, and more student participation in school and community—some intrinsic objectives also appear. Then they help shape a process where teamwork and ideas count and where their efforts yield results. Motivation through meaningful engagement has a clear impact on the school, on the students and on the community.

3. **Efficient access to useful information for decision-making.** If people are to have the information they need, the organization must articulate a process of organizational transformation, involving staff, parents and students in a decision-making process that provides input and incentives for all of the participants “to become actively engaged in problem-solving methods” and gives them “access to information and systematic assessment of results” (Levin, 1997:307). In these forums, it is important that information flows freely and the agreements do not reflect personal interests either explicitly or implicitly.
4. **Adaptability to meet changing conditions.** We live in a changing society. As new challenges arise in the school or in the neighborhood, school committees address them based on existing priorities; if necessary they establish new ones. Various educational actors adjust their strategies to take into account new data about the school and community so they can adjust to new disequilibria.
5. **Use of the most productive technology consistent with cost constraints.** Effective schools promote the most efficient technology for educational growth. For example, the Accelerated Schools Project incorporates the strengths of parents and school staff in helping students to advance through the Constructivist framework. Levin points out that such work helps to create a meaningful learning environment for the children.

#### THE LEARNING COMMUNITIES SCHOOLS PROJECT: THE CASE OF ANTONIO MACHADO PUBLIC SCHOOL IN LA LLANURA, SPAIN

The Antonio Machado Public School is located in a low-income suburb of the city of La Llanura. From its creation in 1980 until its transformation in 2006 into a Learning Communities School, it had another name, Pío Baroja Public School, and a traditional public bureaucratic organization. Before Pío Baroja closed, its students had poor academic outcomes and high levels of absenteeism (above 30%). The student body at this school is low-income, immigrant or Roma. The school also faced conflicts among its students, low levels of parent participation and serious tensions between teachers and parents. In sum, it had many of the inefficient characteristics of a remedial school, with chronically high rates of dropout and absenteeism.

In June 2006, the department of education, along with families and community organizations, decided to close the school, reallocate the teachers, and start a new project. A new public school emerged with a new name and organization. The Antonio Machado Public School was created four days later with a clear new objective: To develop a quality educational project with the collaboration of all the neighborhood's educational agents. At that point, the focus of education shifted from the teachers' inputs to the students' educational improvement.

The first two changes were recruiting teachers who were interested in develo-

ping the Learning Communities Schools Project and then modifying the school schedules and organization to respond to the needs of students, parents and the community. The first step involved a public process of selecting teachers who had experience and training, knew about the Learning Communities Project, and had ideas about how to implement it in the neighborhood.

The second step involved schedules and school organization. In 2005, the school schedule ran from 9am to 3pm. The teachers argued, without any basis in research, that students would do better if they had lessons only in the morning rather than during both morning and afternoon. From their point of view this schedule might improve students' achievement. This situation changed significantly with the new school organization which involved the active participation of parents, community members, and the newly recruited teachers. Meetings were held to assess the most successful educational experiences and decide on plans. The school hours were extended from 5 hours a day to 6. In addition, parents and teachers decided to offer some educational activities after teaching hours, including family training and school reinforcement classes, and to open the school very early in the morning, at 7:30 am, to welcome students.

All these changes were also intended to enrich the curriculum to improve student achievement. This new situation helped transform the school's damaged image, and enrollment soon began to rise (see Table 1). From 2006 on, Antonio Machado School began to attract students; its enrollment has increased by 24. The opposite trend was occurring at Pío Baroja: its enrollment was dropping year after year because parents did not trust that their children would succeed there.

Table 1. *School Enrollment by Academic Year 1994-2008*

Academic year	Number of Enrolled Students
1994-1995	334
2005-2006	100
2006-2007	114
2007-2008	129
2008-2009	141

Source: Crea (2006-2011).

Another indicator related to efficiency and cost-effectiveness is school absenteeism. The project that was agreed upon and developed by teachers, parents, community organizations and the administration reduced the high absenteeism rate that had been registered at the school in earlier years, as shown in Table 2. This problem was solved because all the actors participated in the school organization and the decisions focused on students' needs. Absenteeism is strongly related to student performance. Recent research indi-

cates that reducing absenteeism requires a partnership between the school, the students, the families and the community, which in turn requires family and community involvement in the school project (Sheldom and Epstein, 2004). This relationship is clearly reflected at Antonio Machado School as the following data show.

Table 2. *Evolution of School Absenteeism 2006-2008*

Academic year	Percentage of absenteeism
2006-2007	30%
2007-2008	10%
2008-2009	Occasional

Source: Crea (2006-2011).

Another piece of evidence is the improvement in student performance from one year to the next. Because the students were tested at the end of the second year of primary school, the test results are related to two different groups, from the academic years 2006-2007 and 2007-2008. Table 3 clearly shows a significant improvement in the students' various skills, as analyzed by an external evaluator. For example, their improved skills in reading and writing skills cannot go unnoticed. The students in the first group averaged almost 3 points out of 5, compared to the results of the previous academic year, which were below 1.5 points. For the second group, the results are even more striking. In the 2006-2007 academic year their writing skills were very poor (0.5 out of 5 points); the following year they averaged 2.75 out of 5. Turning to mathematical skills, their 2007-2008 outcomes were also higher compared to those of the previous year (2.5 out of 4 compared to 0.8 out of 5). The student T-test demonstrates the differences between the means of the two groups.

Table 3. *Standardized Test Scores on Some Basic Skills Conducted by External Evaluators at the End of the 2nd Year of Primary School (7-year-old Students)*

Skills	Highest value	2006-07 Mean	2007-08 Mean	T-student
CL1 Listening	5	1,187	2,350	-2,458
CL2 Speaking	5	1,750	3,750	-6,768
CL3 Talking	3	1,250	2,400	-3,291
CL4 Reading	5	1,437	2,950	-1,941
CL6 Writing	5	0,500	2,750	-6,761
CL8 Use of language	3	0,687	1,850	-4,053
CM3 Measures	4	0,868	2,525	-

Source: Crea (2006-2011).

The Learning Communities School Project also made use of a very efficient pedagogical strategy: *interactive groups*. This technique transformed the school into a high-expectation environment promoted by parents, teachers, students and the community. It also developed a different type of class organization, using a learning methodology that promotes dialogue and interactions among students, between students and teachers, and between students and a volunteer teacher aide. In these heterogeneous groups, students learn from each other, creating an environment of solidarity that indirectly affects their school relationships.

The greatest strength of this methodology, however, is the improvements in instrumental learning for all students. Teachers saw improvements not only among those who always performed better but also among those who had more difficulties in learning. For example, the best students “explain all that they know to their classmates in their respective groups, learning how to communicate their acquired knowledge and giving it more meaning and sense” (Aubert et al, 2008:211). The teachers coordinate the various groups’ activities and are helped by other teachers. The assistant teachers may include the remedial teacher from the old Pío Baroja who previously worked with the “worst students”, and volunteers who may be parents, grandparents, former students, or other members of the community.

In this context, efficiency and cost-effectiveness do not correspond exactly: a programme that is effective may be neither efficient nor cost-effective if it achieves its goals but wastes resources in doing so. The Antonio Machado School, however, considers how to get the greatest possible output at relatively low prices and also considers the most cost-effective options among various alternatives. In 2006, the school and community could have been adopted several alternatives:

- Maintain the remedial school with its high rates of dropout and absenteeism.
- Transfer children from this school to nearby schools that have extra capacity.
- Construct a new school.
- Transform the school into a Learning Community.

The first three options would have had no positive effect on the output (student performance). Obviously, the second option was the cheapest; it also looked like the most efficient. But the community avoided these simplistic conclusions based on efficiency; in addition to transportation costs, low family involvement would again lead to school absenteeism and low expectations for these students’ performance in the new school environment.

It is true that small classes and schools are more expensive. This was especially true at the new school, where more professionals, such as social workers and counselors, were hired in order to improve the school’s relationships with the families and neighbors. But, at the same time that the Antonio Machado School is improving its students’ performance and changing its social image by attracting new ones, the relationship between inputs and outputs is becoming completely different from that in remedial schools. It is a cost-effective option

because its principal function is to maximize its students' cognitive achievements and not to socialize them to low expectations and implicitly prepare them for unskilled jobs.

Studies on the microeconomics of education have traditionally focused only on school efficiency, conducting cost-benefit analyses of highly educated and less educated people; we also need a global analysis of school investments in disadvantaged neighborhoods. Some research has focused only on analyses of inputs and outputs within schools; we also need to consider the costs that society faces when students drop out. In this sense, many other studies in the economics of education, including estimation from microeconomics, have demonstrated that better educated people earn more throughout their lifetimes compared to those who do not achieve high school or university degrees (Arrow, 1973; Psacharopoulos and Layard, 1979); other studies have found significant gains for the state through tax revenues and significant savings in social programmes, unemployment subsidies, police and prison costs (Levin, 1996; Ciccone and Peri, 2002). From this holistic point of view, Antonio Machado School is not only the most cost-effective option but also one of the most efficient approach for disadvantaged students and neighborhoods.

#### DISCUSSION AND CONCLUSIONS

We have observed how X-efficiency characteristics were translated into schools as Henry M. Levin suggested, referring to the Accelerated Schools Project. These characteristics can be also found in various projects such as Success for All (Slavin, 1996) and the Harlem Children's Zone (Tough, 2008). They are also present in the Learning Communities Schools Project, as we have seen in the case of the Antonio Machado School. But we think this case demonstrates two further characteristics that are relevant to the issues of efficiency and schools: **family training** and the **involvement of all community agents in the school**.

**Family training** is an effort to open schools to families and the community, building trusting relationships between teachers and parents. In addition to learning from one another, they can talk about the children's learning and other issues of everyday school life. We know that children's school performance depends on all the interactions they have, so it is important to have a wide range of educational agents engage in the school's learning spaces, interacting with the students as they learn reading, computing, or mathematics, or discussing values, child-rearing or other topics they think are appropriate. These parent training programmes are also present in other educational projects such as the Harlem Children's Zone, where the Baby College programme helps parents in Early Childhood Schools to raise their children. It teaches parents about their child's development, building language skills and parenting skills. In addition, in Learning Communities Schools, the family training programmes are present not only in early childhood education but also during the students' entire schooling experience. This learning environment helps children not only to gain instrumen-

tal skills like reading or measuring, but also in learning to be active and critical citizens.

**Involving all the community agents in the school** also helps to transform not only the school but also the neighborhood and the role that the school plays in it. Thus, the school leaves behind its role as a bureaucratic institution of control that reproduces social inequalities, to become an active agent of community transformation. In fact, a range of actors, including minority associations, NGOs, the department of education and other civic society organizations, are working together in the school to encourage its social transformation. At the same time, students from the school participate in community activities both inside and outside the school.

As long ago as 1966, James Coleman concluded that the social composition of a school's student body is more strongly related to student achievement than any other school factor. During the 1970s and 1980s, policy makers interpreted this finding as implying that economic effort and expense should be oriented more directly to families and used to eradicate social disadvantage rather than being spent efficiently on schools themselves. Since the 1990s, however, various school projects have shown significant success in improving the performance of at-risk students, contradicting Coleman's arguments published almost a half century ago. These projects succeed because they put the emphasis on the school itself, not on the social inequalities in which their students are embedded. Thus they transform the school from an inefficient institution that reproduces social inequalities and also change the approach of seeing families and community members as passive educational agents.

If, on the one hand we compare the costs and benefits of educating people and, on the other, consider cost-effective educational practices such as those in the Accelerated Schools Project or the Learning Communities School project, we arrive at the conclusion that promoting this kind of decisive educational policy would help make our society more cohesive, efficient and equal. As scientists, humanists and active citizens we cannot ignore the contributions and policy implications of the Antonio Machado Public School.

#### REFERENCES

- Arrow, K. (1973). Higher education as a filter. *Journal of Public Economics*, 2, 193-216.
- Aubert, A. Flecha, A. García, C. Flecha, R. & Racionero, S. (2008). *Aprendizaje dialógico en la sociedad de la información*. Barcelona: Hipatia Editorial.
- Becker, G. (1957). *The economics of discrimination*. Chicago: The University of Chicago Press.
- Carnoy, M. (1996). Education and racial inequality: The human capital revisited. *Economics of Education Review*, 15, 259-272.
- Ciccone, A. & Peri, G. (2002). *Identifying human capital externalities: Theory and application to US cities*. IZA Discussion Paper 488. Bonn, Germany:

- Institute for the Study of Labor (IZA). Retrieved on July 15, 2009 from <http://ideas.repec.org/p/iza/izadps/dp488.html>
- Coleman, J. (1966). *Equality of educational opportunity*. Washington, DC: US Government Printing Office.
- Crea (2006-2011). Includ-ed: Strategies for inclusion and social cohesion in Europe from education. Unpublished working paper. European Commission: DG Research – 6<sup>th</sup> Framework Programme.
- Elboj et al. (2002). *Comunidades de aprendizaje. Transformar la educación*. Barcelona: Graó.
- Guba, E. & Lincoln, Y.S. (1989). *Fourth Generation Evaluation*. New York: Sage.
- Jenks, C. (Ed.) (1972). *Inequality: A Reassessment of the Effect of Family and Schooling in America*. New York: Basic Books.
- Hanushek, E. (2002). Teacher Quality. In L.T. Izumi & E.M. Williamson (Eds.), *Teacher Quality* (pp. 1-12). Palo Alto, CA: Hoover Press.
- Hanushek, E. (1986). The Economics of Schooling: Production and Efficiency in Public Schools. *Journal of Economic Literature* 24(3), 1141-1177.
- Leibenstein, H. (1966). Allocative Efficiency vs. “X-Efficiency”. *The American Economic Review*, 56, 392-415.
- Levin, H.M. (2005). *Accelerated Schools: A Decade of Evolution*. Dordrecht, NL: Springer.
- Levin, H.M. (1997). Raising School Productivity: An X-Efficiency Approach. *Economics of Education Review*, 16, 303-311.
- Levin, H.M. (1996). Cost-Benefit Analysis: Theory and Application. *Evaluation and Program Planning*, 20, 288-290.
- Murnane, R.J. (1975). *Impact of school resources on the learning of inner city children*. Cambridge, MA: Ballinger.
- Palauàries, J.M. & Serra, C. (2009). De l’escolarització obligatòria a la postobligatòria. El cas de l’alumnat d’origen immigrant. *Observatori de la Immigració a Catalunya*. Retrieved on July 10, 2009 from <http://www.migracat.cat/document/9a371f22a773e4e.pdf>
- Psacharopoulos, G. & Layard, R. (1979). Human capital and earnings: British evidence and a critique. *The Review of Economic Studies*, 46, 485-503.
- OECD. (2008). *Education at a glance 2008: OECD indicators*. Paris: OECD. Retrieved on July 1, 2009 from <http://www.oecd.org/edu/eag2008>
- OECD. (2006). *PISA 2006 results: Analysis and data*. Paris: OECD. Retrieved on July 2, 2009 from <http://www.pisa.oecd.org/>
- Sheldom, S.B. & Epstein, J.L. (2004). Getting students to school: Using family and community involvement to reduce chronic absenteeism. *The School Community Journal*, 14, 39-56.
- Slavin, R. E. et al. (1996). *Every Child, Every School: Success for All*. Thousand Oaks, CA: Corwin Press.
- Tough, P. (2008) *Whatever it takes. Geoffrey Canada’s quest to change Harlem and America*. New York, NY: Houghton Mifflin.