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School Reform and Equal Educational Opportunity: Evidence from the United States

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Introduction

In this paper, we provide a review of the key features of the American school system and discuss a number of reforms that have been undertaken in order to improve the educational attainment of low-income and ethnic minority students. The analysis proceeds as follows. Section 1 describes the general structure of the American schooling system as well as some specific characteristics of the student population. Section 2 reviews some of the traditional policies that rely on increasing expenditure on education and on changing various inputs respectively. Section 3 examines market-based reforms with a specific focus on some recent policy innovations based on standards and changes in the incentive structure. Concluding remarks are presented in the last section.

I) The American School System

1. The Organization of the School System

1. A Structure

Formal schooling in the United States starts at the age of five or six, with one year of kindergarten through secondary school, twelfth grade, when students are 18. Schooling is compulsory in most States until the age of 16.[1] Pre-school is not compulsory and K-12 education is divided into three levels: elementary school, middle school and high school. Elementary school covers grades first to fifth, middle school sixth to eight grades and high school lasts four years and covers: ninth grade (freshman year), tenth grade (sophomore year), eleventh grade (junior year) and twelfth grade (senior year). At the end of secondary schooling students have the option on whether to attend a vocational education institution, a two-year community college or a four-year college or university. Figure 1.1 shows the structure of the American education system.

Students are assessed by teachers in each grade. Promotion to the next grade is determined by classroom grades as well as by teachers' evaluation. Standardized testing has been recently introduced in most States under the No Child Left Behind Act. The Act requires States to test students from third to eight grade in mathematics, reading and science. State-level test does not affect a student's promotion from a grade to the next one (NCES, 2003) but in those States that adopted more demanding standards, the state-level standardized test has become a requirement for high school graduation. There is no national curriculum for education in the United States. States set curriculum guidelines, whereas school districts and schools themselves shape their own curriculum. As a result, curriculum may vary greatly from district to district. In high school, curriculum and coursework are closely related to graduation requirements (NCES, 2003).

High schools also provide courses for high-achieving students. The so-called advanced courses, Advanced Placement (AP) and International Baccalaureate (IB), provide more demanding instruction, which is equivalent to first year college courses. AP is organized by the College Board and allows gifted students to get academic credits for college in the United States and also in a number of foreign countries. On the other hand, IB is organized by the International Baccalaureate Organization, has a greater international outlook and aims at providing a set of credits recognized in a larger number of foreign countries.

[1] In 30 States compulsory schooling ends at age 16, in nine States at age 17 and in 11 States and District of Columbia at age 18 (NCES, 2007). See Bridgeland et al. (2008, appendix II) for a description of the Compulsory School Attendance Laws by state.

Most schools are public. Admission to public schools is determined by local residence. Private schools are mainly of religious denomination. This is explained by how historically education spread across the United States. Schools were built by local communities and very often, as in Europe, Catholic hierarchy and religious orders encouraged the creation of schools with the main objective of transmitting to children the ethic and founding values of their community (Glenn, 1998). For many years the greater number of private schools in the United States was Catholic, the majority of which was built in the 19th century as a response to the Protestant dominance. Most religious schools are Catholic, and organized by individual parishes; the overall system is organized by Catholic dioceses. Catholic schools charge tuition fees that are on average lower than the other private schools. Other religious schools are mainly supported by Protestant organizations and include Adventist, Baptist, Lutherans and Episcopalians. On the other hand, secular schools include both schools with specialized educational programs and independent college preparatory schools. As of 2008, approximately 88 percent of students attend public schools and 12 percent private schools. Among those who attend private schools, 40 percent are enrolled in Catholic schools, 38 percent in schools of other religious affiliation and 22 percent in secular schools. Also, approximately 3 percent of students are homeschooled. Historically this school option was chosen for religious and moral reasons, in the 1960s as a political movement criticizing the State formal system but the recent expansion has different determinants (Gaither, 2008). In this regard, a recent survey of the NCES (2006a, table 4) shows how religious factors were the main reason for approximately 30 percent of parents for choosing homeschooling, whereas for the remaining of parents nonreligious factors were the most important motivation for their choice (e.g., concerns about safety in school, dissatisfaction with academic instruction at other schools, special needs). Homeschooling regulation varies across States, ranging from States like California and Texas where homeschoolers have to comply with rules that apply to non-accredited schools, to States like Maine and New Hampshire where there is a specific statute that regulates homeschooling.

The American education system is highly decentralized. The State involvement in education is a relatively recent phenomenon of the 20th century. Until then, local communities had nearly exclusive control on education and the action of legislators in most cases was limited to extending best practices to the more backward communities (Reisner, 1930; Glenn, 1998). The governance of the existing system is shaped at three levels: federal, state and local levels. The U.S. Constitution does not refer to federal responsibility for public education. Consequently, the role of the federal government is limited to research, financial assistance, and recently also to issues related to accountability. The 10th amendment of the Constitution provides the legal foundations for State responsibility in public education. 48 States have boards of education which are appointed either by the Governor or by the public. State

Boards set standards, approve the assessment system, set the accountability system and approve both school accreditation and teacher certification. A State superintendent supervises the implementation of the State policy. Also, States have statutes that grant authority over education to local communities. Control of schooling is a local responsibility which is organized at district level. There are approximately 15,000 school districts with local school boards. Local school boards have authority on hiring of local superintendent of schools, principals and supervising programs of study for districts and schools. On the other hand, the local school superintendent designs the educational program of the district and supervises principals and the operation of schools in the district.

1. B Funding

The organization of funding of the schooling system is closely related to the structure of governance. Funding of public elementary and secondary schools is mainly a responsibility of local and State authorities (NCES, 2003). Apart from a common basis of shared responsibility between States and local districts to provide basic education, each State has its own formula for funding education. On average, in 2005 the share of federal funding was approximately equal to 9 percent, the share of State funding 47 percent and local funding 44 percent respectively (Thompson and Crampton, 2008, figure 2.7). It is important to notice that great differences exist across States. On one hand, in Illinois local funding is approximately equal to 60 percent. At the other hand of the spectrum, State funding is equal to 70 percent in New Mexico. Moreover, the importance of local funding has progressively been reduced overtime: in 1919-1920 local sources provided 83 percent of K-12 education whereas in 1978-1979, for the first time, State funding exceeded the share of local funding (NCESb, 2006). State governments generate the revenue for educational expenditures from income taxes, corporate taxes, sale taxes and fees, whereas local funding is generated through local property taxes. In this regard, funding tends to vary greatly from district to district, generating differences between affluent and impoverished communities. Table 1 presents some key indicators of the U.S. education system and the student population.

2. Key Challenges and Reforms

2. A Key Challenges

Recent international studies such as the Third International Mathematics and Science Study (TIMSS) and the Program for International Student Assessment (PISA) show how children in the United States lag behind their peers in other industrial countries. This is shown in both, a study that assesses the knowledge related to the curriculum learnt in the classroom (TIMSS) and a study that assesses the ability of students to use in the outside world knowledge and skills acquired at school (PISA). In PISA 2006, the United States ranks below the OECD average (OECD, 2006a) whereas in TIMSS 2007, it ranks below the top Asian and European performers, at both 4th and 8th grades (Mullis et al., 2008). Moreover, the gap widens as students progress through elementary and high school: in 4th and 8th grades the United States is among the top 20 performers whereas by age 15, American students score below their counterparts in the top 20 countries[2]. A similar pattern can be observed in the three subjects tested: reading, mathematics and science. Also, with regard to college graduation rates, the United States is positioned below the OECD average: approximately only 75 percent of students are completing upper secondary programs as a percentage of the age group normally completing this level, against an OECD average of 82 percent (OECD, 2006b). Specifically, in 2004, 33 percent of those at the typical age of graduation have completed a traditional university degree.[3]

The disparity in students' achievement across ethnic and socio-economic lines is also striking. In spite of a reduction in the gap in academic performance between whites and ethnic minorities between the mid-1970s and the late 1980s, the gaps in standardized test scores by race and ethnicity remain quite large (Phillips and Jencks, 1998). Latinos and Afro-American students lag behind Asian and White students. While, these ethnic minority groups on average have improved their performance with respect to 1971, there has been no improvement in recent years (NCES, 2008). U.S. Latinos and African-American students are approximately 2-3 years behind the average white student (McKinsey, 2009), lagging behind the other students in both achievement and educational attainment (NCES, 2008). Moreover, high dropout rates affect the high school system. Estimates show that high school graduation rates vary between 68 and 71 percent for the year 2004-2005 with

[2] The information has been derived from the McKinsey (2009) report and adapted to include TIMSS 2007 results.

[3] Even though not all students completing their degree are in the age band used in this indicator, this index provides an indication of college completion rates.

significant differences among ethnic groups: 50 percent of students of ethnic minority background completes high school against approximately 76 percent of students of white and Asian background (Swanson, 2003; Greene and Winters, 2005; Bridgeland et al., 2006)[4].

A systematic underachievement is also observed among low income students, at every level of schooling (NCES, 2008). Also, inequality in achievement and funding across districts is sizeable. In 1998, the gap in funding between affluent and poor communities could be between $15,000 and $4,000 per student per year (Biddle and Berliner, 1998).

This achievement gaps bear a high cost to society. Using a simulation approach, a report recently released by McKinsey (2009) shows what would have been the economic gains if the United States had closed these achievement gaps between 1983-1998: the international gap (9-16 percent higher GDP), the ethnic minority gap (2-4 percent higher GDP) and the low-income gap (3-5 percent higher GDP).

The United States was the first country to achieve universal elementary education,[5] the leader of the "high school movement", and also the first country that created the "common school", by providing instruction to students from all backgrounds into a comprehensive institutional framework, as well as the leader in the expansion of higher education. Goldin (2001) highlights how some characteristics of the American education system that allowed it to develop its distinctive character and to become the education leader over the twentieth century may no longer be the characteristics of leading nations in our century. That is, characteristics such as funding based on local property tax, openness of the system in terms of absence of formal tracking, almost exclusive reliance on general, academic instruction, as well as the expansion of mass general education, may become detrimental in a changing economic context. In this regard, what seems to be interesting is to examine how the system is adjusting to remain competitive and what are the reforms undertaken to close the gaps described.

2. B Reforms

In 1982 the Reagan administration made education reform a top political priority. With the publication of the report *A Nation at Risk* in 1983, the National Commission on Excellence

[4] See table 1 for trends in dropout rates.

[5] Glenn (1998); Peterson and West (2003).

in Education warned that America' s education system was "being eroded by a rising tide of mediocrity". This was not just a political agenda for education reform to improve the overall system, "it sought, in effect, a new, far more ambitious role for public education, one that would redefine the social landscape in America by giving all students the same educational opportunities" (Toch, 2008). Standards and accountability, as well as competition between public and private schools were progressively introduced across States to make the education system more efficient. Later in 2002, these policy changes were formalized with the federal *No Child Left Behind Act* (NCLB). The Act introduced a standard-based education reform in order to address the lagging performance of the education system. Among other things, the reform led to an increase in the level of competition between schools, increased accountability, increased federal spending flexibility, as well as greater school choice for parents and students. Interestingly, the shift over time has occurred from "educational inputs and processes" to "educational performance" -based reforms, being the focus on the overall performance of the education system largely motivated by the need to increase the overall efficiency of the system. Apart from resource-based policies and market-oriented reforms, the analysis that follows will focus on the reforms undertaken to reduce inequality in spending as well as policies undertaken to reduce the achievement gap previously described. Finally the analysis will cover specific measures for low-income and minority students.

II) Traditional Policies

Traditional policies have largely relied on increasing resources per children. Policies aiming at improving the overall efficiency of the school system and reducing educational inequality have relied on two related channels: school finance litigation and education policy reforms.

1)Finance-Based Policies

Adequacy lawsuits refer to the legal instrument used by advocates of increased and redistributed education funding at the State level. In this regard, States have been sued when they failed to provide an education that is "adequate" according to the State's own constitution. It is seen as an instrument to overcome the under-provision of public funding in the more disadvantaged areas. It represents a legal development of the original equity lawsuits, being conceived as a tool to guarantee equal educational opportunity.

This tool has its origins in the fight against racial segregation[6] (Greene and Trivitt, 2007), with the landmark *Brown v. Board of Education* decision that recognized public schools divided by race to be unequal. Following from this, reformers turned to fiscal inequality, claiming that the same principle could apply to school funding as resources and educational opportunity vary greatly in school districts of unequal affluence (Thompson et al., 2008). This is because inequality on the basis of geographic location and related wealth would be the same as discrimination. The subsequent shift from "equity" to "adequacy" occurred as a result of the idea that equalizing resources across areas was not a guarantee for achieving an equitable education. Therefore, the resources had to be "adequate" for the needs of schools and districts across the country. That is, "adequate" to ensure a certain level of educational achievement, acknowledging that districts with low property tax are also those with the population more costly to educate (Ladd, 1999), and that these areas may need more resources for children to achieve a satisfactory level of education.

It was the *Rose v. Council for Better Education,* decided in Kentucky in 1989, the first court case where the new paradigm was introduced and the court-remedy decision consisted of

[6] The Supreme Court decision ended the *de jure* segregation. However, *de facto* segregation persisted in many ways due to the racial inequality across communities and neighborhoods. In this regard, "busing" plans were conceived as an attempt to reduce racial segregation and foster integration by allocating students in schools according to the race instead of proximity. The constitutionality of "busing" was presented in the 1971 Supreme Court decision *Swann vs. Charlotte-Mecklenburg Board of Education*. This created a strong opposition, especially in cities like Boston and Los Angeles. Another supreme Court decision, *Miliken vs. Bradley,* limited busing across schools in the same district. This led to many families of European background to move to the suburbs to avoid busing and left public districts by the end of the 1980s, when busing ended, with a greater share of population of ethnic minority and low-income background.

ordering an increase in expenditure across more disadvantaged areas to guarantee an "adequate" education.

Following this first successful lawsuit, the concept of adequacy was included in the subsequent sentences on school finance equity (Peterson and West, 2005). Heise (2005) documents how the shift from "equity" to "adequacy" also led to a greater success of the lawsuits in the court. Since the first judicial case, adequacy lawsuits have been brought to the court in 45 U.S. States and plaintiffs have been successful in more than half of the cases (Greene and Trivitt, 2007). In particular, the number of adequacy lawsuits has significantly increased following the enactment of No Child Left Behind in 2001 (Peterson and West, 2005, fig.1.1). According to this legislation, each State has to set annual targets and assess every year the performance of each district and public school. Plaintiffs have been using the failure of the Adequate Yearly Progress as supporting evidence of the inadequacy of the education provided by the State.

According to Bolick (2007), the adequacy judicial action led to a significant change in education finance across the nation, in particular through the increase in the role of the State in school financing and with the increase in funding for less affluent school districts, which aimed at compensating the property tax-based school financing. The rationale behind being that by equalizing spending an equalization of outcomes would follow.

Is adequacy litigation a promising solution to improve educational opportunity for less affluent and minority students? Have changes in school finance been beneficial to increase equality in educational outcomes?

Empirical evidence on the effectiveness of these policies casts doubts on the fact that the increase in resources alone has been successful in improving the educational achievement in more disadvantaged areas.

In the first nationwide empirical study on the effects of school finance equalization rulings, Evans, Murray and Schwab (1997), find that the court remedies succeeded in leading to a more equitable distribution of resources across school districts. These findings were criticized in a later study by Hoxby (2001), who finds no real improvement in the more disadvantaged areas, suggesting that court-remedies may have quite different effects depending on how States implement the court decisions, and also on the tax price of local spending existing in the financing system. In this regard, the author highlights the limitation of the existing studies that make use of dummy variables to identify the impact of court's decisions. Berry (2005) examines court decisions over 1970-2003 in 50 U.S. States and finds that court sentences led to an increase in State governments spending on education, revealing that state-aid is targeted to more disadvantaged areas. However, inequality of spending within States, between high and low-spending districts only decreased by 16 percent. Moreover, by looking at the results, it is not clear at what level inequality has been reduced, and there is no statistically significant different effect between lawsuits based on equity and adequacy grounds. Greene and Trivitt (2007) investigate the impact on educational achievement of the increase in per-pupil spending resulting from court decisions and do not find evidence that changes in the school finance system have led to improvements in

students' performance. Hanushek and Lindseth (2009) examine the effect of increased expenditure in four States (Kentucky, New Jersey, Massachusetts and Wyoming) where litigations have existed for the longest time and, with the exception of Massachusetts, find little evidence that these were also the States that experienced the greatest reduction in the gap in educational outcomes. Overall, results from nationwide studies or analyses that appear to be more methodologically rigorous do not show that school finance system reforms *per se* can provide more equal learning opportunities, but show that adequacy is unlikely to make educational opportunity more equal (Peterson and West, 2005).

2)Resource-Based Policies

Expenditure on education has increased in the United States in the last forty years. As of 2005, there is no other OECD country that spends as much per pupil in primary through tertiary education (OECD, 2008). Among the policies based on inputs, class-size reduction and policies related to teachers' characteristics have been widely adopted by policymakers across U.S. States. Hanushek (2006, table 3) reviews 376 estimates in existing studies on the effect of resources on achievement and points out that in most cases the effect on students' achievement is not significant, being student-teacher ratio only significantly positive in 14 percent of the estimates. On the other hand, teachers' characteristics appear to vary and be positive and significant in 9 percent of the estimates for teachers' education and in 29 percent of those including teachers' experience. In what follows, a brief overview of the policies that have been central to the U.S. debate is going to be presented.

Class size Reduction

Class-size reduction policy has attracted lots of attention in the United States, among policymakers and has been extensively studied by scholars. However, it is a very difficult policy to assess as class allocation is likely to be correlated with observable and unobservable characteristics that have an impact on both class allocation and student's achievement.

Krueger's (1999) study was a landmark, as it was the only study based on a large-scale field experiment ever conducted in the United States[7]. Students involved in the Tennessee Student/Teacher Achievement Ratio (STAR) experiment were randomly assigned to small (13-17 students) and large (21-25 students) classes from kindergarten to the third grade and their performance was assessed at the end of each academic year. Sizeable positive effects on students' performance were found (performance on standardized test increased by four percentile points), especially for minority and more disadvantaged students (the effect being estimated to be twice as much). Interestingly, the size effect is observed at the end of the first year and then the gap in achievement between the two different class sizes remains constant until the third grade.

These findings raised among other scholars questions on the external validity of the experiment and the way the research design and the quality of the experiment itself. Critics have referred to parents' prior school choice that may be affected by the expected class-size

[7] Over 4 years, 11,600 students from 80 schools in Tennessee (Krueger, 1999, p.498).

allocation and the "Hawthorne effect", which is related to the change in effort made by individuals who know they are taking part to an experiment.

This study was very influential among policymakers (Mishel and Rothstein, 2002). In 1996, the California legislature passed a reform that aimed at reducing class size at elementary level from an average of 29 to a maximum of 20 students (Stecher and Bohrnstedt, 2002). This reform was inspired by the STAR project.

Hoxby (2000) takes a quasi-experimental approach that relies on using class size variation resulting from variation in population in schools in Connecticut. By using both methods, the cross-section regression discontinuity method that relies on the isolation of the random component of population variation for each grade in each school, as well as the within-school regression discontinuity method (by relying on class changing as a result of a change in enrollment affecting the maximum or minimum class size rule). Overall, Hanushek's (1999, 2006) meta-analysis reviews show that a reduction in class size does not necessarily lead to an improvement in students' performance, and the cost would be extremely high.

Another policy question that has regained increasing public interest is related to school size. Empirical studies that focus on the effects on student educational attainment and progress, mainly based on the United States, show that the size that optimizes students' achievement varies between 600 and 900 students for primary and between 800 and 1,200 students for secondary schools (e.g., Lee and Smith, 1997; Lee and Loeb, 2000; Bickel et al. 2000, Schneider et al., 2007). The economic argument in favor of small schools being that they increase attendance and graduation rates, decrease disruptive behavior, as well as increase students' participation in extra-curricular activities and parents' involvement. On the other hand, supporters of larger schools rely on economies of scale, increased specialization. More recent international evidence shows mixed results and the lack of a significant relationship between school size and students' performance for Italy (e.g., Schuetz, 2006).

Teachers' quality and characteristics: qualifications, experience, certifications, test scores and salary

Rivkin, Hanushek and Kain (2005) in what became an influential study first introduced the value-added analysis. They examined teachers' impact by looking at the change in performance of the classroom and controlling for teacher and school background characteristics. That is, the innovation consisted in examining the overall teachers' effect on the classroom learning gains and not by focusing on specific teachers' characteristics. Using data from 200,000 students in more than 3,000 schools involved in the Texas Schools Project

their results show that students' rate of learning is significantly related to teachers' turnover and teachers can have an impact especially for those students from a more disadvantaged background. Moreover, much of the variation in students' learning gains occurs within schools rather than between schools. National data show that teacher turnover is high: at the end of the 2003-04 academic year, 17 percent of elementary and secondary school teachers left the school where they were teaching; among these 9 percent left teaching (NCES, 2008).

To examine teacher effects scholars have examined specific measureable characteristics: teachers' qualifications, experience, certifications, test scores and salary. Specifically, the body of the existing research includes studies on teachers' education (Hanushek at al., 2005), where most studies find no effect of teachers holding graduate degrees on learning achievement, teachers' certification (e.g., Murnane et al., 1991; Jepsen and Rivkin, 2002; Wayne and Youngs, 2003), and teacher experience (Murnane and Phillips, 1981; Hanushek at al., 2005), where in most cases after the first year of teaching there is no significant effect arising from additional years following the first one. Studies on teacher certifications have proved to be no less controversial. Empirical evidence is inconclusive.[8] In the literature, Goldhaber and Brewer (2000), Walsh (2001) find positive effects on students' performance from teachers having standard certifications, whereas Jepsen and Rivkin (2002) find a very small impact. Hanushek and Rivkin (2006) suggest that the existing studies are not very informative as they rely on certifications that reveal teachers meet the requirements set by the State at the time when they are hired. Moreover, each State has its own system of teaching certification, and for most of the 20th century the only requirement to become a teacher was attending a teacher preparation program granted by the State. Starting from the 1990s the Interstate New Teacher Assessment and Support Consortium and the National Council for Accreditation of Teacher Education set standards for teachers' licensure and accreditation. Currently, teachers' certification range from high standard requirements where a teacher needs to have a college major in the subject of teaching as well as intensive preparation for teaching (e.g., Massachusetts, Minnesota, Wisconsin) to less demanding ones where only a minor in the field to be taught and little teaching experience are required (e.g., Alaska, Missouri).[9] Teacher shortage in the 1880s and 1990s led some States to lower the standards for prospective teachers.

Also, teacher test scores, recently made available with the accountability systems, have been found to be better predictors of teachers' performance than the other observable characteristics (e.g., Wayne and Youngs, 2003). Teachers' college ratings and better-ranking

[8] For a review on the existing studies, see Wilson et al. (2001), Wayne and Youngs (2003).

[9] See Darling-Hammond (2002).

undergraduate institutions have been found to have a positive effect on students' performance (Summers and Wolfe, 1977; Murnane and Philips, 1981).

Other scholars have focused on working conditions and teachers' pay. Hanushek and Rivkin (2007) have looked at Texas data on teachers. They discuss how education and experience are the main determinants of teachers' salary and how teachers' pay is not significantly related to performance.

Existing studies show that teachers' effect on students' learning is sizeable. However, the traditional policies based on observable teachers' characteristics have proved to have little effect on students' performance. Reform proposals to introduce a merit pay system, whereby teachers would be compensated according to their performance, are currently being discussed and President Obama is in favor of introducing these reforms.

III) Market-Oriented Reforms

1) Standards (and accountability with *No Child Left Behind*)

No Child Left Behind (NCLB) is a United States Act of Congress originally proposed by President Bush. NCLB passed as a bipartisan piece of legislation that aimed at providing "a new path of reform" for American schools. The Act was a comprehensive manifesto that included many recommendations already started under the Reagan and Clinton administrations; as a result, some aspects of the policy were a political compromise and many of the key issues were defined in practice (Rudalevige, 2003). This legislation is particularly important as it increases the power of the federal government. The NCLB Act strengthens the accountability provisions of the 1994 legislation. Under the Elementary and Secondary Education Act (ESEA) of 1994, States had to adopt accountability measures for those schools that were receiving federal funds. In this regard, NCLB linked what was (in many States) a preexisting accountability system to specific consequences (Hanushek, 2004).

Central to the Act is the closing of the achievement gap. The reform agenda to achieve this aim is based on the creation of an accountability system that relies on three pillars: setting high-standards, defining an annual assessment and defining consequences in terms of rewards/sanctions for improving/failing schools.

In this regard, each State had to establish an accountability system and set clear standards on what students should learn at each grade in elementary and high school in English language/arts and mathematics (and starting in 2007 also in science). Every year an assessment for students in every grade from 3rd to 8th is expected to be carried out. Each State is also expected to make some progress every year, the Adequate Yearly Progress (AYP) in order to meet the final goal of having all students proficient by 2014. Each State has the responsibility of making improvements and each year results on school and district performance are published on the State and district report cards. If a State fails to meet the AYP for one year, assistance is going to be provided, if for two consecutive years, then the district has to implement corrective action and school choice is going to be offered to students in failing schools. After three years, all disadvantaged students can either transfer to a school of choice or receive private tutoring. On the other hand, rewards in terms of bonus fund exist for schools ("No Child Left Behind" school bonus fund) and States ("Achievement in Education" bonus fund) that make significant progress.

All 50 States have now adopted accountability measures under the NCLB framework. NCLB has provided some guidelines but each State developed its own system. Standards vary greatly across States, and the success (or failure) of meeting the AYP is not directly related to

students' performance when a common measure of assessment is used. A recent report presented by the Fordham Institute is shows how the different State provisions affect the "Adequate Yearly Progress" across States, by comparing the performance of students in 18 elementary and 18 secondary schools. Namely, the performance of each school is assessed using a common framework that allows estimating what would have been the performance of each State under the legislation existing in one of the other States in the sample. That is, the performance of each State on spring 2006 was used to test if that State would have passed the AYP requirements in another State. Among the interesting results that this study shows, central is the difference in standards that exists across States. At elementary level, only a school would have passed the standards existing in Massachusetts, whereas 18 out of 17 schools would have passed the AYP set in Wisconsin. At secondary level, the picture looks quite different

Among the existing studies that assessed the impact of NCLB on students' achievement, Hanushek and Raymond (2005) estimate the impact of the introduction of accountability system before the passage of the legislation and use the National Assessment of Educational Progress (NAEP) as a measure of students' performance for 4^{th} through 8^{th} and compare their performance between States with accountability system and those without. Their empirical findings show that States that introduce accountability systems experience a greater achievement growth than States without an accountability system.

A study authored by the Rand Corporation was carried out by in three States: California, Georgia and Pennsylvania. Information related to teachers, principals and district superintendents, as well as their response to the introduction of standard-based accountability systems was collected starting in 2002. This research shows some of the key differences between the accountability systems of U.S. States. Interestingly, the authors show that some of the existing differences, such as the difficulty level and the method used to calculate AYP existed before the enactment of NCLB. This study, even if in a descriptive way, suggests that the tentative of realizing a homogeneous accountability system across U.S. States with aligned curriculum and assessment has not yet been realized.

Among the limitations identified by scholars and summarized by Peterson and West (2003), the main one is related to the discretionary power that each State has to administer the standards. As a result, some States have actually lowered their standards. These laws can have a great effect in improving the overall system depending on the way they are administered. High-stakes accountability arrangements vary greatly across States.

Specifically, standards are set by each State. Each State defines its own standard of proficiency in English language/arts and mathematics. This proficiency level will be used to assess the Adequate Yearly Progress. The law does not require the use of any common test (e.g. NAEP), so that each State can use its own assessment. State-level standards vary by their level of difficulty (NCES, 2007; Kingsbury et al., 2007). Moreover, each State can set its timetable on the intermediate achievement (e.g. annual measurable objectives), being the main objective to have all students at a proficient level by 2014. In this regard, States can set a confidence interval to take into account any possible statistical error in calculating proficiency rates, leaving to each State the discretion over setting a confidence interval and its size. Another limitation of the reform is that students are held accountable of their performance only in a limited number of States, where the passing of a high-stake test is a graduation requirement (e.g., Massachusetts). In the other States, students take the test without any consequence on their performance.

Moreover, Kane and Staiger (2002) suggest that the overall accountability system relies on a flawed measure of students' performance that greatly differs across States.

In addition to this, even if standards for disadvantaged students (.i.e. ethnic minority low-income students; students with limited proficiency in English) are set at the same level than the other students. Some scholars (e.g., Kane and Staiger, 2003) consider the fact of having accountability for ethnic minority students as a limitation because each State determines what sample should be included in the sample used to assess the Annual Yearly Progress. Another study (Rand, 2009a) shows how less affluent students have failed to take advantage of the increased school choice opportunity. The study shows that in case of failing schools only a small share of low-income and ethnic-minority students uses school choice and effectively changes school. Also, Dee and Jacob (2009) find positive effects of accountability on students, particularly large for 4^{th} grade students in mathematics.

2) School Choice

2.A Charter Schools

Characteristics of Charter Schools

The expansion of school choice in recent school reforms has been partly motivated by the aim of increasing schooling options for families whose choices might otherwise be constrained by low incomes, job location, residential segregation, or other factors[10].

The formation of charter schools was particularly encouraged in less affluent urban communities as a way to provide and experiment more effective teaching approaches than the one existing in public urban districts. Charter schools are today concentrated in urban areas (West and Peterson, 2006)

The Charter school[11] "movement" belongs to a pro-market orientation that has shaped education policy in the United States in the last 15 years. They represent a significant innovation in the American education system. Since Minnesota passed the first charter school law in 1991, 47 states have passed a similar legislation. They have expanded rapidly: an estimated 1.15 million children was attending 3,977 charter schools as of the academic year 2006-07, up from only 100 schools in 1995-96 (Center for Education Reform, 2003).

Charter schools are publicly funded elementary or secondary schools that have been freed from some of the regulations related to curriculum and governance that apply to other public schools. In return they have to provide some type of accountability for producing certain results, which are set in each school's charter. That is, charter schools are not accountable for compliance with predefined rules and regulations but are responsible for outcomes set in their charter. The rationale being that greater autonomy and less bureaucratization would provide greater flexibility and the possibility to introduce new learning strategies and innovative programs.

The U.S. Department of Education only indicates the seven areas that each state-legislation should cover: charter development (i.e., who may start a charter, rules to start a school,

[10] See Figlio (2007) for a review.

[11] The concept of charter school is credited to New England educator Ray Budde. He first suggested in the 1970s that groups of teachers should be given greater autonomy (i.e., "charters") by local school boards to experiment new approaches. The approach was adopted in Philadelphia, where these schools-within-schools were called "charters". Other states like Minnesota and California were among the first to adopt similar approaches (Hassel 1999, p.4).

number of schools allowed); school status (i.e., governance); fiscal (i.e., funding provided and autonomy); students (i.e., admissions, discipline, ethnic-racial balance special education); staffing and labor relations (i.e., labor relation regulations); instruction (i.e., degree of control over goals and practices); accountability (i.e., regulates the assessment method, as well as issues related to revocation and renewal). Thus, the charter defines the mission of the school, governance and also parameters that assess the overall performance (Schneider et al., 2007). As a consequence, basic principles concerning the nature and function of charter schools are the same but there are significant differences across States with respect to the way charter schools are regulated, managed and actually operate. Charters are granted for a set number of years (that varies from three to five years). After this time a review of the performance determines whether or not the school will continue to operate or will be closed.

A larger share of disadvantaged students is enrolled with respect to the traditional public schools. They do not charge tuitions and the funding they receive from the state depends on the level of enrollments (i.e., "money follows the student").

Who goes to a charter school: greater share of low-income students. A greater share of low-income and ethnic minority students is enrolled in charter schools than in the traditional public sector. This is because, as previously described, relying on the local residence for school assignment, make it more likely for disadvantaged students to be enrolled in low-performing schools. Moreover, the fact that these schools are either free or charge very low fees make it a particularly attractive option for less affluent student populations. (Schneider et al., 2007).

From an economic perspective the innovation relies on the different set of incentives that charter schools face. Hoxby (2009) shows how they serve as laboratories for new education ideas, as competition with the public sector, the greater flexibility and the possibility of being closed make agents operating in these schools face a set incentives that create a great dynamism in the sector. Overall, they face greater autonomy and have to provide accountability and results (Hassel, 1999). An increasing number of charter schools have recently experienced financial problems (Hassel and Batdorff, 2004). According to the data provided by the Accountability Report on Charter Schools of the Centre for Education Reform, in 2009 nearly 13 percent of charter schools had closed since 1992 (i.e., 657 out of 5,250). Among the main factors found to have had an impact, first are financial deficiencies due to low student enrollments or insufficient funding (41 percent of cases), second is mismanagement, which may be related to factors such as lack of accountability, non-compliance with the charter law or lack of adequate programs (27 percent) and other factors

such as poor academic performance or political issues accounted for only 14 and 10 percent of charter schools closing. Moreover, as a result of the current economic crisis, charter schools may be exposed to additional challenges[12]. For example, funding to charter schools may be delayed due to the financial market meltdown (for instance, this has been recently experienced by charter schools in California), philanthropies may decrease their support (as recently experienced by the New York City charter schools), and also commercial banks as well as community development financial institutions are likely to decrease their lending and underwriting to charter schools. It is also important to notice the heterogeneity that characterizes the U.S. states. More schools were closed in California (approximately 7.8 percent of charter schools had closed), Arizona (5.3 percent) and Florida (4.7 percent), and the causes look also very different, varying 2 (Arizona) and 28 (Florida) percent for failing to meet academic goals, 37 (Florida) and 59 (Arizona) percent for financial issues, as well as 21 (Florida) and 33 (California) percent for mismanagement; on the other hand, no charter school was closed in Hawaii, Iowa, Mississippi, Rhode Island and Wyoming.

Charter Schools and Students' Performance

Supporters of charter schools claim that charter schools may have benefits that are related to the market factors. First, they may lead to an improvement in students' performance due to a greater flexibility and the possibility of easily introducing new methods. Moreover, by the evolutionary market process it is possible that over time only the successful ones will remain in operation. Also, supporters believe that increased competition will be beneficial for public schools because of the threat of competition is likely to increase the overall productivity of the schooling system.

On the other hand, those who are against charter schools (among which prominent are teachers' unions) argue that the market forces will be detrimental to students, as it will create greater instability in the system and would introduce some selectivity in the selection process that would harm the less affluent students.

[12] This has been recently discussed in the framework of a conference organized by the National Alliance for Public Charter Schools on the assessment of financial risk for public charter schools.

Recently, it has been possible to examine empirically the performance of charter schools, and to assess their effect on students' performance. Many studies are now available[13]. The analyses have compared students' performance in charter schools with respect to the performance of those who are enrolled in traditional public schools. Results of charter school achievement studies carried out in the last 10 years provide mixed evidence on the overall effects on students' performance, even when controlling for many family and school background characteristics (Hassel, 1999, 2004; Ladd and Bifulco, 2006; Rand, 2009b).

Among the existing studies, single-point analyses compare students' performance in public vs. private schools. The most comprehensive of these studies was undertaken by Hoxby. Hoxby's (2004) study covered 99 percent of all charter schools in the U.S. showing that students in charter schools outperform their public school counterparts, with differences across grades and subjects. Moreover, empirical evidence shows that ethnic minority students are likely to benefit from this schooling setting. However, no attempt is made to establish a causal relationship given the nature of the existing data.

Other studies are limited to individual states. Most of these studies also show that after a few years charter schools get better in terms of performance. They control for many background characteristics. However, the limitation of these analyses is that they rely on observational data. Even if an effort to control for background characteristics is made, it is very difficult to establish a causal relationship between school type and performance as they do not take into account the trajectory of the learning process and the improvement that may occur over time.

In this regard, longitudinal studies represent an improvement. They do not only measure the level of achievement but also the gain over time (i.e., the value added). These studies are now available for many States: the Rand Corporation examined eight States, whereas recently the CREDO at Stanford has carried out research that covers charter schools in 16 States. Results from these studies show no systematic evidence that these schools are actually skimming off the best performing students (Rand, 2009b), the overall impact on students' achievement is mixed (Rand, 2009b; CREDO, 2009) and graduation and college entrance appear to be positively affected (Rand, 2009b). A recent study on New York City charter schools by Hoxby et al. (2009) shows that students enrolled in New York City charter schools from

[13] For a review of the existing studies, see Hassel (1999), Lake and Hill (2005), Rand (2009b).

kindergarten to eight grade nearly perform as well as their counterparts living in affluent suburban areas.

The most accurate studies up-to-date arise from experimental analyses. Studies on lottery-based admissions to charter schools have been carried out in New York, Chicago and Washington (Hoxby and Rockoff (2005); Hoxby and Murarka (2007, 2008)). In these randomized field experiments, varying positive effects are found for African American and Hispanics as well as for low-income students. Also, those students who enter at an earlier grade are likely to experience a greater improvement in performance, in both reading and mathematics. The overall finding from these studies is that a small number of charter schools in New York and Chicago do not outperform the traditional public schools.

This entrepreneurial and innovative educational effort seems also to be better accepted by the public and policymakers with respect to alternative school choice options. That is, public opinion shows a rather moderate view on charter schools, and they are preferred to the more radical solution of vouchers, as suggested by National Survey undertaken under the auspices of the Harvard's Program on Education Policy and Governance last year.

2.B Other School Choice Programs

Other options of school choice include magnet schools, tuition tax credit, homeschooling and school vouchers. In what follows we provide a brief description of the different initiatives but the focus of the analysis will be on vouchers as little empirical evidence is available on the other school choice programs.

Magnet Schools

Magnet schools are institutions that offer a specialized curriculum. They were initially conceived as a tool to end racial segregation by providing geographically open admission. They were created in the 1960s, initially conceived in the framework of the Open School Movement. They are public schools run by districts and are free. Admission depends on entry tests and lotteries.

Tuition tax credits

Tuition tax credits currently exist in Arizona, Florida, Illinois, Iowa, Minnesota, Pennsylvania and Rhode Island. They consist of scholarships provided by the School Tuition Organization, which receives funding from donations (for which tax deduction is possible). Students receive these scholarships to attend both private and public schools.

Homeschooling

Homeschooling has recently experienced a significant expansion: the U.S. Department of Education's National Center for Education Statistics reports that approximately 1.5 million were being educated at home in 2007 against the 850,000 who were being homeschooled in 1998; as previously suggested nearly 3 percent of U.S. students are currently educated at home and homeschooling is legal in every state, with regulations varying across states and requiring only parents' notification in some states like Texas (where parents only have to start educating homeschooled children when they are six and provide a written curriculum), to heavy regulations in the state of New York (where parents have to provide a letter of intent accompanied by a home instruction plan, as well as written records of attendance, quarterly progress reports and annual assessment)[14]. The limited number of empirical

[14] Home Schooled Legal Defense Association (2009).

studies available do not allow to draw definitive conclusions but show that homeschooled students perform well academically, also when college enrollments are considered (e.g., Rudner, 1999; Ray, 2003). Among the benefits perceived, homeschooling provides greater flexibility in terms of teaching methods and curriculum.

School Vouchers

School vouchers are publicly funded coupons that provide parents with the opportunity of choosing the school for their children. Schools of choice can be either public or private. Starting with Milton Friedman's pioneering work, vouchers were conceived as a policy tool to increase the overall efficiency of the American system. They were introduced in the United States in the 1990s with the purpose of providing low-income families with the opportunity to choose better schools for their children.[15]

Vouchers in the United States exist as small scale programs.[16] They exist under both public and private programs. As of 2008, there are 21 choice programs in 13 States. In spite of the expansion, they remain small scale programs[17]. They started as public programs, the first public program was introduced in Milwaukee in 1990, and later these programs were introduced in Arizona, Cleveland, Florida, Ohio and Washington D.C. In most cases they were introduced in urban districts given the high share of disadvantaged children and children from ethnic minority's background. Most of the existing programs are structured for low-income students or failing schools ("Disadvantaged Student Voucher Programs"); other programs exist in Maine and Vermont where public schools do not operate ("Town Tuitioning Programs"). In 2005, federal funding was given to displaced students in regions affected by hurricane Katrina for them to attend a school in their new location.

Private programs were introduced after the mid-1990s. It was after John Cardinal O'Connor's, the Cardinal of the Archdiocese of New York, influential speech who proposed to offer free Catholic instruction to the 1,000 most disruptive children in New York City. This never happened but inspired a group of financial leaders and philanthropists who

[15] Friedman conceived the ultimate scope of vouchers to be "universal" rather than just limited to low-income families (Interview by Nick Gillespie, Hoover Institution, *Digest*, vol.1, 2006).

[16] Universal voucher or tuition tax credit programs were voted down in California in 1993 and 2000, in the state of Washington in 1996, in the state of Michigan in 2000, in Colorado in 1992 and in Utah in 2007.

[17] Large scale programs are in place in countries like Chile, Sweden, Czech Republic and New Zealand. The law that would have made these programs universal for K-12 education did not pass in any of the U.S. states. The first public program introduced in Milwaukee, was extended in 2006 to cover 15 percent of Milwaukee public school enrolment (Friedman Foundation 2008, p.49).

established the first of such programs, The School Choice Scholarships Foundation, which provided a voucher for 1,300 low-income families (West and Peterson, 2006). Following this first example, similar privately-funded voucher programs were introduced in Washington D.C., Ohio and Texas, as well as nationwide with the Children's Scholarship Fund's Program. (Ladd, 2002a).

The existing programs are designed to provide children from more disadvantaged background, particularly of ethnic minority background and residing in inner-cities, with an increased educational opportunity (as the options for these families would be limited to the school in the area where they live, which is likely to be in a more disadvantaged area).

School vouchers are among the most hotly debated instruments of public school reform. Supporters of vouchers argue that competition will improve the efficiency of the overall system, improve students' achievement and increase parents' involvement in their children education (Friedman, 1955; West and Peterson, 2006). Moreover, advocates of school vouchers in the United States acknowledge the fact that moving from public to private can be beneficial if private schools are superior (Coleman et al., 1981). Opponents see negative consequences of vouchers with respect to the learning opportunities of the more disadvantaged students and in terms of increasing educational inequality (Carnoy, 2001). In the context of this study the question of interest is whether vouchers can be effective in reducing inequality and favoring more disadvantaged students.

Do school vouchers materially improve the educational lives of disadvantaged minority students? How does the design of specific voucher programs affect performance? Evidence from the existing studies is not conclusive. Randomized-field trial experiments have been used where vouchers were oversubscribed and consequently were allocated on a lottery-base. For a review of this literature, see Rouse (1998) and Hoxby (2003).

Peterson at al.'s (1998, 2002) examined the Milwaukee, Washington, New York and find that vouchers benefit African-American students in elementary and middle schools. These results were criticized (e.g., Carnoy, 2001; Ladd, 2002b) due to the non-random allocation of some groups of students and subsequently revised by Rouse (1998) who found a smaller impact in mathematics and no positive impact in reading. Hoxby (2001, 2003) suggests that the ideal voucher would raise students' performance, without "cream-skimming" students but by attracting those who have a low performance in the public system. On the other hand, Ladd (2002b) warns against the possible limited effects of a large-scale program by drawing from the international evidence and looking at the experience of Chile and New Zealand.

In this context, Neal (2002) provides an analysis of the possible consequences arising from the introduction of a large-scale voucher program. Specifically, he considers the likely change in the set of incentives agents involved in the education system would face. Thus, he highlights the danger of relying exclusively on students' test scores and graduation rates to evaluate the introduction of a program that would radically change the entire education system. Another critique is raised by Carnoy (2001) who critically reviews results from experimental studies.

In light of the existing evidence it is not possible to draw conclusions on what would be the educational impact from the introduction of a large-scale voucher program and if more disadvantaged students would benefit from it.

3) Other Programs for Disadvantaged Children

3.A The Harlem Children's Zone Project (HCZ)

The Harlem Children's Zone (HCZ) Project is a community-building strategy of Harlem Children's Zone Inc., a non-profit organization, conceived to improve the overall well-being of the residents who leave in the 100 block area of Central Harlem, between 116th and 123rd streets and between Fifth and Eighth Avenues (Nicholas et al., 2005). It is regarded by both academics and policymakers as one of the most ambitious social-service experiments of our time," (*The New York Times).* The program was founded by Geoffrey Canada, President and CEO. In the 1990s it started with a pilot block and gradually expanded to its current size, by including 24 blocks in 1997 and 100 blocks in 2007. It relies on private donations[18] which makes it very sensitive to economic fluctuations. In order to address the current economic downturn, public service campaigns were organized.

The idea underlying the design of the program is that policies that a comprehensive approach needs to be used in order to provide the adequate support to the more disadvantaged students. The idea is quite revolutionary as, so far, the approach of economists has been to focus on marginal changes and measure their impact on students'

[18] Another recent initiative is the "Back to school" program, a $35 million gift provided by Mr. Soros, to provide$200 to each child from New York low-income families to buy school supplies for the new school year.

performance. Central among the aims of the program is to provide support to families living in the zone, as well as creating a sense of community. Among the network of support provided within the HCZ, the following policies are currently included: All-day pre-kindergarten; Extended-day charter schools; health clinics and community centers for children and adults during after-school, weekend and summer hours Youth violence prevention efforts.

President Obama has announced a *20 Promise Neighborhoods* program, which is modeled after the HCZ and aims at replicating its success in poverty-stricken areas of other U.S. cities such as Philadelphia and Miami.

Only a study on the educational impact of this program on students' performance is currently available, even though the initiative has attracted lots of attention from media and policymakers. Many descriptions and reviews of the program exist but only an analytical study of the effects on students' educational achievement is currently available. This is mainly due to the methodological difficulty of estimating an entirely new set of incentives, and also data confidentiality. Harvard Economist Roland Fryer has examined students' performance in the zone with and compared it to students' performance in standard school. They compared students in these schools to students in New York City as a whole and to comparable students who entered the lottery to get into the Harlem Children's Zone schools, but weren't selected. By using and experimental approach that relies on using lotteries data from the admission to the Program, Fryer shows that the impact has been sizeable for ethnic minority students and that this improvement in the overall system in the long run is likely to reduce the African-American educational achievement gap. What seems to be particularly effective with respect to the previous policies (most of which have relied on "marginal" changes) are both the holistic approach, that fosters a sense of belonging and community, as well as an early intervention.

3.B Teach for America

Teach for America (TFA) is a program that recruits top graduates from the best U.S. colleges and universities to teach in the more disadvantaged urban K-12 schools for two years. It was founded by Wendy Kropp in the early 1990s. A recent graduate of Princeton

University, Ms. Kropp, wanted to create an educational program modeled after the Peace Corps to address the issue of poor and unequal education in the more disadvantaged urban areas. This recently-graduated student from Princeton started the program in the early 1990s with the motivation that "one day, all children in our nation will have the opportunity to attain an excellent education".[19] The aim is to foster educational equity especially among young generations as well as raising awareness among future leaders. Since then, the program has known a great expansion: in 1990 only 500 teachers were selected for the program whereas in 2007, 2,900 recently-graduates from elites colleges joined the program out of 18,000 applicants. As of 2008, 35, 000 applications were received and approximately 3,700 teachers selected (TFA, 2009). These teachers were teaching in more than 1,000 schools across 22 U.S. regions (TFA, 2009). The great expansion of the program in most U.S. States was largely due to teacher shortage and high turnover rates especially in the less well-off metropolitan areas. In the framework of the program, TFA members receive a five-week intensive training before actually starting the actual teaching. Although some members of Teach for America have some prior teaching experience, there is no requirement for them to hold formal teaching credentials, with the idea that a degree from a top institution and some initial training would provide them with a good background for teaching. During the two-year program they receive compensation and benefits similar to those given to the other teachers in the same school.

In spite of the significant media and policy attention given to the program, there are a few studies that have accurately estimated the impact of this specialized recruitment program on students' achievement. Among these, Raymond, Fletcher and Luque (2001) examined teacher performance relying on student and teacher data from the Houston Independent School District and by comparing TFA teachers to the other teachers with standard certifications Even if this study raises the question of external validity, the impact of TFA teachers is not found to be statistically different from the non-TFA teachers. Moreover, the group of TFA teachers appears to be more homogeneous than the other group. In a more recent study, Decker, Mayer and Glazerman (2004) find that TFA teachers have a positive impact on students' achievement in mathematics and also in reading.

Turnover among TFA teachers appears to be higher than for certified teachers at the beginning of their career. This has been pointed out by critics of the program who also claim that the lack of formal teaching certifications is likely tower the overall teaching quality.

[19] Kopp (1994).

3.C Virtual Schools

Distance learning is not a recent phenomenon in the United States. However, the contextual development of the computer technology on the one hand and the expansion of charter schools have led to a growth in educational options related to virtual learning. These schools rely on the provision of instruction through internet-based methods (Morando Rhim et al., 2005), with teacher and student separated by distance and/or time. The main agents operating in the sector are either charter schools (which represent the largest share), or regional agencies or consortia of educational organizations, or State or local agencies. As of 2007, 24 States had adopted State-run virtual learning programs, providing instruction to nearly 700,000 students (Tucker, 2007).

So far, two models of online schooling have developed. In the first model, virtual schools receive State funding, are regulated by the State, offer courses that supplement regular coursework and they do not award diplomas. Examples of States that adopted this kind of virtual schools include Florida and Wisconsin. On the other hand, charter virtual schools in Florida and Wisconsin are veritable public schools that grant diplomas

The State-run Florida Virtual School has grown rapidly. In the academic year 2008-09, approximately 84, 000 students enrolled, which is 10 times greater than the number of students who enrolled in the 2002-03 school year (Tucker, 2009). As reported by a FLVS student survey, more than 50 percent of students reported as main reason for enrolling at FLVS, the need for improving their performance in the public system (i.e., taking a course to graduate in time, raising a course grade, balancing academic and curricular activities); approximately 13 percent chose this schooling option for Advanced Placement and only 12 percent for being a homeschooler. The recent expansion has been largely driven by the increased enrollment of minority students (Tucker, 2009). The program offers personalized instruction, and daily interaction with a teacher, who checks students' participation and performance.

It is not possible at the moment to provide estimates for the effect on students' achievement, and ultimately the measure the overall impact on the public schooling system. The only study currently available has been provided by Morando Rhim and Kowal (2000) on FVLS, without finding any significant learning difference between virtual learners and their counterparts enrolled in public schools.

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APPENDIX

Table 1 Descriptive Statistics of the Education System and the Student Population in the United States[20]

Education System

Educational Institutions

Number of educational institutions, by level and control of institution: Selected years, 1980-81 through 2006-07

Level and control of institution	1980-81	1990-91	1995-96	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Elementary and secondary schools	106,746	109,228	122,059	---	130,007	---	130,407	---	132,436	---
Public	85,982	84,538	87,125	93,273	94,112	95,615	95,726	96,513	97,382	98,793

Source: NCES (2008)

Expenditure

Current expenditure per pupil in fall enrollment in public elementary and secondary schools: 1990, 2000, 2005

School Year	Current expenditures in unadjusted dollars	Current expenditures in constant 2006-07 dollars[1]
1990	4,902	7,472
2000	7,380	8,604
2005	9,154	9,391

Source: NCES (2009)

[20] Source: NCES Digest of Education, *various years.*

Teacher Qualifications

Percentage of public high school-level teachers who reported a major and a certification in their main assignment, by selected main assignments: 2003-04

Selected main assignment	Total Certified	Major in main assignment		No major in assignment	
		Total	Certified	Total	Certified
English	80.2	84.5	71.1	15.5	9.1
Mathematics	77.2	76.0	64.5	24.0	12.7
Science	80.0	87.2	71.7	12.8	8.3
Social Science	81.8	83.6	70.7	16.4	11.1

Source: NCES (2008)

Student Population

Enrollments

Enrollment in elementary and secondary schools, by level and control of institution: 1990, 2000, and 2005

Year	Total	Public			Private		
		Total	Grades Pre K-8	Grades 9-12	Total	Grades Pre K-8	Grades 9-12
1990	46,864	41,217	29,878	11,338	5,648	4,514	1,134
2000	53,373	47,204	33,688	13,515	6,169	4,906	1,264
2005	55,187	49,113	34,205	14,908	6,073	4,723	1,350

Source: NCES (*various years*)

Educational Attainment

Educational attainment of 25-years old and over by ethnic group: 2006

	Percent with high school completion or higher	Percent with bachelor's degree or higher
Total	84.1	27.0
White	88.9	29.9
Black	79.5	16.9
Hispanic	60.3	12.3

Source: NCES (2007)

Dropout Rates

Dropout rates of 16-24-year olds by ethnic group: 1990, 2000, and 2005			
	1990	2000	2005
Total	12.1	10.9	9.4
White	9.0	6.9	6.0
Black	13.2	13.1	10.4
Hispanic	32.4	27.8	22.4

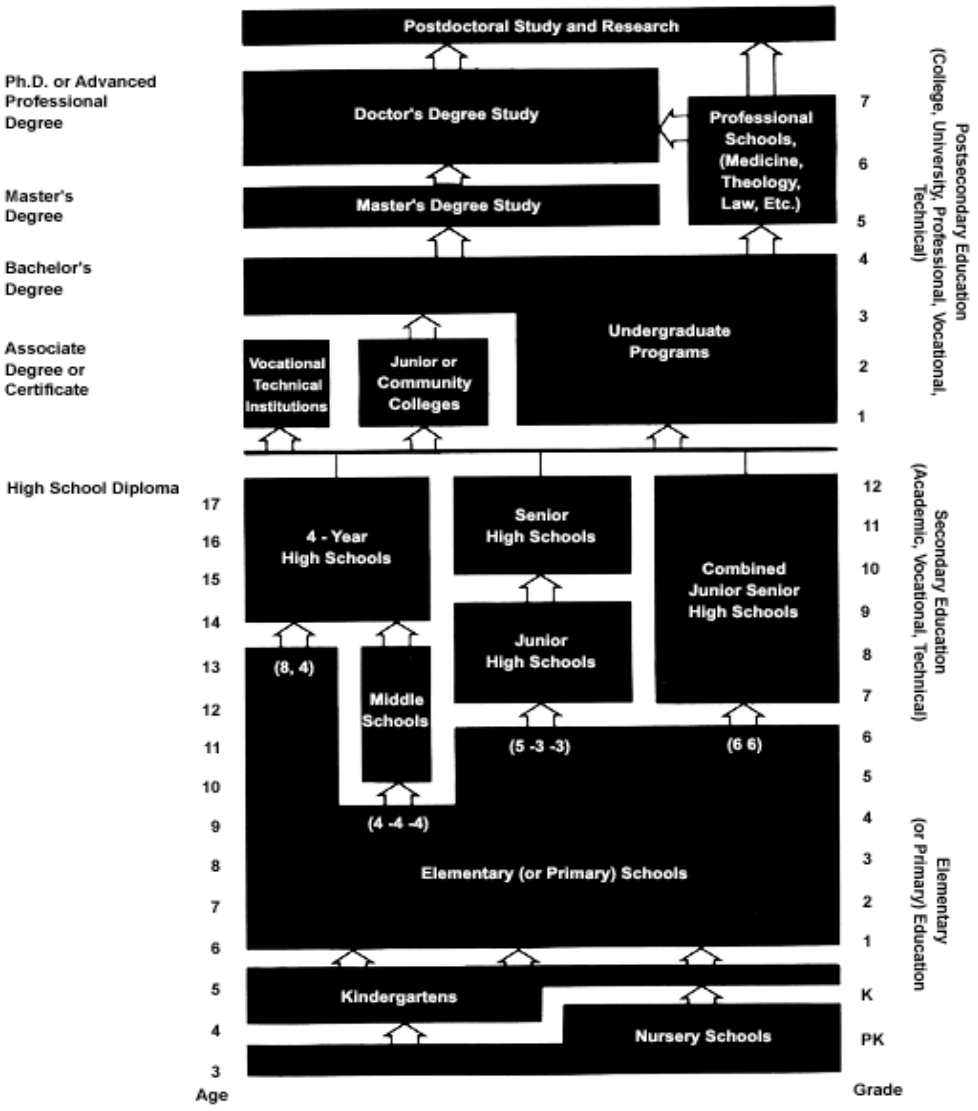
Source: NCES (*various years*)

Vocational Education

Percentage of public high school graduates taking different types of career and technical education (CTE) coursework: 1990, 2000, and 2005			
CTE coursework	1990	2000	2005
Took any CTE courses	98.0	96.6	96.6
Took any occupational courses	90.6	90.9	92.0
Completed an occupational concentration, total	22.8	21.8	20.8

Source: NCES (2008)

Figure 1.1 Structure of the Education System in the United States



Source: U.S. Department of Education, National Center for Education Statistics