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Education in Israel:

The Challenges Ahead

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ABSTRACT

The purpose of this paper is to increase the awareness by outsiders of the challenges faced education in Israel as well as to impact on the policy dialogue within Israel. The paper argues that Israel's economic growth and social cohesion are threatened by the mediocre performance of its primary and secondary schools as well as by the division of schooling into four almost completely separate sub-systems each of them dependent on religious observance and/or affiliation. The paper reviews the reasons for Israel's poor performance, the demographic challenges faced by the school system, and recent initiatives by the government to improve education.

The approach of the paper is that of synthesizing a wide variety of secondary sources, including Israel's performance on both international and national achievement tests, research articles and reports on the state of Israel's education system, statements and proposals by stakeholders, and conclusions of an international seminar on education in Israel held in May 2012 and attended by leading policy makers and analysts. The paper compares Israel's education policies with best practice worldwide. It concludes that Israel needs to do more to improve education, through articulating clear, consistent and long term goals agreed upon by all stakeholders, ensuring more equitable distribution of resources, recruiting teachers with higher knowledge and competence, and breaking down the barriers between the separate systems.

This is the first English language review of education in Israel that combines educational, economic, social, and demographic perspectives. It shows how Israel's education challenges are similar to those of many other countries yet also unique within the complex reality of Israeli society

I. INTRODUCTION: ISRAEL'S KNOWLEDGE CAPITAL

Israel's greatest resources are the knowledge, abilities, and creativity of its population. Yet, its future competitiveness as well as its social cohesion are at risk because of the inadequacies of its primary and secondary education system, which Israelis discovered beginning twelve years ago when their school children scored relatively poorly on international tests of achievement in language and mathematics. The education challenge for Israel is made more complex by the realities of demography, such that the Haredi and Arab communities together will soon constitute a majority of Israel's primary school students.

Those outside Israel who are committed to its success and stability as a country need to be aware of the issues facing its education system. Yet there is little systematic information available to them. The few English language overviews of Israeli education are written from an economic perspective rather than one that links economic, social and pedagogical issues. Both inside and outside Israel most education discussions revolve around the interests of specific groups. While the combination of successes, failures, and issues in educational development Israel faces are its own, many of these problems can be found elsewhere in the world. International experience and research can therefore play a critical role in identifying policies that can put Israel on a path to sustainable educational reform.

This paper seeks to provide an overview of Israeli education from an international perspective, with a main but not exclusive focus on primary and secondary education. It is based on a wide variety of sources as well as visits to schools and discussions with teachers, principals, leading educators and researchers. Its principal audience is Diaspora Jews and others wishing to understand and in some way help to meet the education challenges facing Israel. The paper reviews the status and challenges of primary and secondary education in Israel that might account for its low level of achievement on both national and international tests that runs contrary to the image of Israel as the "Start-Up Nation" of entrepreneurship and high tech. It reviews current efforts at improving Israel's education system from the point of view of international best practice in education reform and suggests approaches that could improve education quality. The paper pays particular attention to issues related to the divided school system and to disadvantaged and minority groups.

At the outset, it should be recognized that Israel's achievements in higher education, science, technology, and culture are impressive. Sixty percent of Israel's youth enter higher education institutions and an additional 26% take post-secondary training or short courses, figures significantly higher than the OECD average.[1] Israel ranks third in the world in the number of academic degrees per capita (28% of the population).[2] While Arabs still lag in higher education attendance, especially in science and technology, their higher education participation has accelerated since 1995.

While they do face significant challenges and issues (see Annex 1), Israel's higher education institutions overall rank high in international estimates of quality. The Hebrew University, the Technion, the Weizmann Institute of Technology, and Tel Aviv University are ranked among the world's 200 top universities.[3] Some of its colleges are leaders in technology, graphic arts, and other areas. Israel has one of the highest ratios in the world of scientists and engineers in its labor force.[4] Its ratios of patents, scientific papers published, and Nobel prizes awarded compared to population are among the highest in

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[1] OECD, *Education at a Glance 2010*, p. 57
[2] OECD, *Education at a Glance 2010*, p. 34
[3] Ministry of Industry, *Intellectual Capital of the State of Israel*, p. 22.
[4] *Ibid.* The ratio of science and engineering personnel among Jews is even higher since Arabs are under-represented in science and technology.

the world. Israel invests the highest portion in the world of its GDP in R&D (4.65%), of which 75% comes from the private sector.[5] Government policy has created an "enabling environment" for innovation through linking university and private sector research. The early success of this approach has led to a "virtuous" cycle, where more youths are attracted to science and technology because of the successful experiences of the past.

Seven million Israelis buy 12 million books every year, making them one of the highest consumers per capita of books in the world. More than 90% of Israelis read a newspaper at least once week.[6] The figures for film production, concerts attended, dance companies, and adult education classes offered are all very high compared to Israel's population. Israelis regularly win international awards in graphic arts, entertainment, and music.

Why is there such a striking difference between Israel's successes and achievements in science, technology and culture, and its mediocre primary and secondary schools? One argument is that military service in the Israel Defense Force (IDF) plays a major role in building intellectual discipline, emphasizing achievement, and encouraging creativity and risk-taking.[7] After youth leave the army they are more mature and career-oriented, become more serious in furthering their education, and are perhaps better able to link the practical with the theoretical in their studies. The IDF's custom of selecting the best and brightest high school graduates to work in the intelligence field has created a cadre of future high tech leaders. These young people have become the leaders in the high tech revolution.

The transforming experience of the army will touch a decreasing proportion of Israel's youth, in part because of the growing Arab and ultra-orthodox population. Israel depends excessively on a small cadre of innovative workers in high tech industries. In fact, the overall productivity of Israel's work force has not increased compared with its competitors.[8] The relatively low quality of schooling, as well as the sharp ethnic and religious divisions within its education system, is likely to be a "time bomb" threatening Israel's future. A higher quality and more equitable primary and secondary school system is essential to build a productive labor force and ensure Israel's economic and social viability.

II. Description of the Education System

Israel's education system consists of six years of primary education, six years of secondary education (divided into three years of middle school and three years of upper secondary education) and three to five years of higher education. Pre-schooling includes one compulsory year of kindergarten, which is state funded, and one to two years of pre-schooling. Primary and secondary education in Israel is divided into four distinct and separate school systems—secular Jewish, religious Jewish, Arab, and ultra-orthodox (discussed in detail below).

The Ministry of Education is responsible for school curricula, educational standards, supervision of teaching personnel, and construction of school buildings. Local authorities are charged with school maintenance as well as acquisition of equipment and supplies. Teaching personnel at the kindergarten and primary school level are ministry employees, while those in the upper grades are employed by local

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[5] OECD, *Science, Technology, and Industry Outlook.* 2008. Paris. p. 170.
[6] Ministry of Industry, Intellectual *Capital of the State of Israel*, p. 25.
[7] Senor and Singer, Chapter 4.
[8] Ben David, "A Macro Perspective on Israel's Society and Economy," 2009, p.31

authorities, which receive funding from the Ministry according to the size of the school population. This arrangement is probably a result of concerns at the time the state was established aimed at ensuring universal primary schooling, as well as a common core, for purposes of national cohesion. School principals are responsible for pedagogical issues in their schools and, especially in secondary schools, play a significant role in selecting staff.

With the exception of a few private Christian schools, nearly all elementary and secondary schools are public or publicly financed. Over the last decade, the government has allowed considerable diversity in the actual provision of schooling, with many schools acting to some extent as "charter" schools, in addition to an "experimental" school program wherein the Ministry funds alternative schools. At the secondary level, NGOs are often contracted to play a role in managing schools

Attendance is by catchment areas for primary schools in the desired stream (religious, state, Arab), although parents often find ways to circumvent this regulation, and by parental choice in secondary schools. A national completion examination, the "Bagrut," is given in the last years of secondary education. National diagnostic testing (the "Meitsav") is given in selected primary and lower secondary grades.

Institutions of higher education consist of seven universities (Haifa, Hebrew, Tel Aviv, Bar Ilan, and Ben Gurion Universities, the Technion, and the Weizmann Institute of Science), 50 colleges, about half of which are teacher training institutes, and an "Open University" providing distance and part-time education. The approximately fifteen fully private higher education institutions are growing but account for a low overall percentage of enrollments. A Council for Higher Education, which is chaired by the Minister of Education, provides oversight.

Israel's school-age population (aged 5-24) as a percentage of the population as a whole is 33.5%,[9] a figure which is higher than nearly all OECD countries, where the average is 26 %,[10] a result of high birth rates in Israel, especially among Arabs and ultra-orthodox. The total number of students enrolled in the education system in 2010 was over 1.4 million, with 828,000 in primary education, 259,000 in secondary education, and 358,000 (including part-time students) in higher education. Nearly all children attend primary and secondary schools. Ninety percent of school-age children in Israel complete secondary education, compared to the average of 80% for the OECD.[11]

Israel overall spends around 8% of its GDP on education. This ratio is higher than most OECD countries, where the average is 6%.[12] Israel's "demographic burden" that is, the high percentage of the population aged 5-24, as well as high enrollment rates, is one reason that it spends more as a percentage of GDP than many OECD countries. In contrast, Israel's expenditures per student are 23% lower than the OECD average.[13]

The breakdown of expenditures for 2006 (the last year available in public documents), shown below, serves to illuminate how the system operates.

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[9] CBS, Statistical Abstract of Israel, No 62 (2011) Table 2.1 and Table 2.19.
[10] www.stats.oecd.org
[11] OECD, *Education at a Glance* 2010, p.54.
[12] Hemmings.
[13] OECD, *Education at a Glance* 2009, p. 202.

Table 1. Percentage of Current Expenditure by Source and Level of Education, 2007

	Households and Private Non-Profit	Public Non-Profit and Local Authorities	Central Government
Pre-primary	22.1	22.3	55.6
Primary	6.5	5.9	87.6
Secondary	26.3	4.3	69.4
Higher--university	36.9	**-14.0**	77.1
Higher--colleges	46.4	12.2	41.3
Total	22.0	8.1	69.9

Source: CBS, Statistical Abstract of Israel, No 62 (2011), Table 8.2. Public universities are heavily subsidized by the central government and so have negative net expenditures.

The central government provides 69.9% of all financing, local authorities (municipalities) cover 8.1% of total, and households, individuals, and private non-profit institutions account for 22% of total expenditures. Cities like Tel Aviv, with a strong tax base, supplement central government financing. Parents, especially those in higher income brackets, pay for items such as afternoon pre-schooling (the Government only covers morning pre-schools), tutoring, textbooks, and enrichment in primary and secondary schools (the "grey" education market), as well as tuition and books in higher education.

III. Divided Society, Divided Schools

Four Separate School Systems

Israel's overall population in 2009 was 7.55 million, of which 74.5% was Jewish, 20.3% Arab Muslim, Christian, or Druze, and 4.2% classified as "other." [14] The number of ultra-orthodox[15] was estimated in 2006 at 700,000, or 9% of the population.[16] These deep social, religious and ethnic divisions are reflected in Israel's education system, which consists of four separate and distinct streams. Israel is not the only country in the world with separate school systems, which are common in many multi-cultural societies, especially in those in which there is little separation between the state and the predominant religious denomination in the country. [17] The situation in Israel is complicated by the fact that segments of the ultra-orthodox and Arab populations question the authority of the state.

Enrollments in the four systems in 2000, 2009, and projected to 2016 are as follows:

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[14] CBS, Statistical Abstract of Israel, No 62 (2011) Table 2.1. "Others" are neither Jewish nor Arab.
[15] This term is used interchangeably with "Haredi."
[16] There is a great deal of uncertainty about the exact number of ultra-orthodox. See Yair Ettinger, *Haaretz*, April 21, 2011.
[17] Even in the Netherlands, the school system has for centuries been managed by religious organizations, mainly Dutch Reformed and Catholic but now including Jewish, Muslim, and other groups.

Table 2. Enrollments by Stream Primary and Secondary Education, as % of Total

	2000 Total	2009			2016 Total*
		Primary	Secondary	Total	
State	52.0	38.0	52.0	44.0	41.5
State-religious	14.5	14.0	14.0	14.0	14.0
Arab	21.5	27.0	25.0	26.5	27.0
Ultra-orthodox	12.0	20.0	9.0	15.5	17.5

* Projections estimated based on Central Bureau of Statistics data
Source: CBS, Statistical Abstract of Israel, No 62 (2011), Tables 8.11 & 8.21

Public state schools ("mamlachti") serving secular Jews accounted for 44% of primary and secondary enrollment in 2009 down from 52% only nine years earlier. The language of instruction in these schools is Hebrew, although Arabic is taught as a required subject in lower secondary school and later as an optional subject in upper secondary schools. [18] These schools offer a typical general curriculum of language, math, science, history, civic education, etc., and include instruction in "Bible study." An estimated 1% of Arabs attend these schools, which are formally defined as "Hebrew-speaking" rather than as "Jewish." Their participation is believed to be growing, since Arabs in urban areas such as Jaffa, Lod, Nazareth Illit, and Haifa may wish to attend state Jewish schools where they perceive academic instruction to be better and where their children's Hebrew language skills could be improved.

Public state "religious" ("mamlachti dati") schools, serving religious but not ultra-orthodox Jews, account for 14% of enrollment in both primary and secondary education, down from 14.5% a decade ago. These schools follow the same general curriculum as secular schools, but also include additional intensive religious study. For the most part, students come from observant ("modern orthodox") families following traditions such as Kashrut and Shabbat, although many students come from what is called "traditional" families (usually "Mizrachi," originally immigrants from Arab countries) which are less observant. By law, the state must make religious schooling available to parents on demand, a situation which, in smaller communities, leads to smaller schools and lower student teacher ratios.

Public Arab (or Arabic-speaking) schools enroll 26.5% of primary and secondary students (27% primary, 25% secondary), up from 21.5% in 2000. These schools serve Muslims, Christians, Bedouin, and Druze. The language of instruction is Arabic, although Hebrew is taught as a subject. These schools have been historically underfunded compared to Jewish schools, although recent governments have taken actions to redress the balance, including building new classrooms to meet the needs of a growing population. Student-teacher ratios are higher in these schools than in secular Jewish schools. Nearly all teachers are Arab. The curriculum, except for language, is nearly the same as that of Jewish schools. Arab educational leaders believe that sensitive subjects, such as history, should more openly discuss the historical experiences of the Arab population. Since the language of instruction in Arab schools is Arabic, Arab graduates of secondary schools find it difficult to succeed in higher education, where the language of instruction (with the exception of one or two teacher training institutions) is Hebrew. They are also put at a disadvantage in higher education compared to Jews, who have spent 2-3 years in the army, are more mature, and receive financial support from the Government to prepare for the Bagrut and university entrance exams.

[18] Secular Jewish Israelis are generally not observant, in the sense of attending synagogue services, practicing Kashrut, and traveling on Shabbat, but they celebrate and/or observe national Jewish holidays. A small but increasing number of "secular" Jews attend or celebrate milestone events such as weddings and Bar Mitzvah festivities in reform and/or conservative synagogues.

"Private" but publicly funded "ultra-orthodox" or Haredi, schools account for 15.5% of primary and secondary school enrolment (20% primary, 9% secondary). Haredi schools do not follow the national curriculum and, except for some girls' schools, do not study math, science, English, social studies, or civics. Male graduates do not join the army and 60% of male graduates do not enter the labor market (unlike ultra-orthodox groups in the US and Canada, who are more integrated into the general economy). For the most part the schools do not take part in any national or international exams and little research is available on them. There are actually four separate ultra-orthodox systems, some of which are not overseen by the Ministry of Education.

Impact and Challenges of a Divided School System

The divided school system leads to inefficient management and deployment of teachers, resulting in lower student teacher ratios especially in state religious and ultra-orthodox schools, since the state is required to provide them at the request of parents. Only a very small percentage of Jews teach in Arab schools or Arabs in Jewish schools.

A divided school system as well as residential segregation leads to lack of respect and understanding for the "other." Along with 29 other countries, Israel participated in the 2000 IEA Civic Education study of knowledge and attitudes of eleventh graders with regard to citizenship, democracy, national identity, etc. Not surprisingly, the study found major differences between Arabs and Jews in pride in Israel's achievements, history, national symbols, rights of Jewish immigrants, and the legitimate uses of military power. Arab students were also less likely than were Jewish students to identify the strengths and threats for democracy and had lower levels of efficacy, trust, and support for "altruistic" patterns of citizenship.[19]

"School choice" in Israel, while important for allowing communities and social groups to strengthen their own identity, leads to increased social segregation and, indirectly, to lower achievement for disadvantaged children. In Israel, only 40% of eighth graders attend schools that have a "mixed" socio-economic composition, compared to the average of 50% for OECD countries. Over 50% of disadvantaged students attend schools which are predominately disadvantaged. Disadvantaged students in Israel attending predominately-advantaged schools score more than 50 points higher than would be expected given their background.[20]

Differential population growth will have a profound impact on the nature of schooling and on Israeli society as a whole. Current birth rates are 6.0 children per ultra-orthodox woman, compared to 2.1 for secular and "modern orthodox" women. Among Arabs, there are 3.l children per woman, a rate that has been declining rapidly, but it is still 5.0 for Bedouins in the south of Israel. The birth rates of Haredi and Arabs are likely to continue to decline, and it is possible in the future that there will be "leakage" out of the ultra-orthodox to modern orthodox or secular. Nonetheless, and taking these declines into account, as can be seen above, by the year 2016 "secular" primary and secondary school enrollment is expected to decline to 41.5%%, with Haredi and Arab enrollments combined reaching 44.5%. At the primary level Haredi enrollment will reach 22.3% of total and Arab enrollment 26.2%, for a total of 48.5%. By 2030 the school age population (5-24) will be 28% Arab.[21] One study estimates that if fertility rates remain at

[19] See Ichilov (2000), pp. 371-395.
[20] PISA II, pp. 93-94.
[21] CBS, Statistical Abstract of Israel, No 62 (2011), Table 2.26.

6.0 per woman, then Haredi children aged 0-14 will account for 44% of Israel's total 0-14 population by 2028.[22]

The educational challenge of serving a school population in a divided system that is majority Haredi and Arab, to say nothing of the political, social, and economic implications of a future majority Haredi and Arab population, are daunting. In terms of the economy, there will likely be increased numbers of young adult Haredim who are neither prepared nor willing to enter the labor market, thus requiring the rest of society to subsidize ever-larger numbers of Haredi families. While Arabs are increasingly completing secondary education and entering higher education, inadequate technical and scientific knowledge, inadequate knowledge of Hebrew by Arabs, and discrimination in the labor market will make it difficult to utilize fully the Arab labor force, with negative impacts on the prospects for increased productivity of Israel's labor force as a whole.

IV. Learning Achievement in Primary and Secondary Education

Disappointing Performance in International Assessments

Israel's public had been led to believe that Israel was a leader in educational achievement, based on the international testing programs in which it participated in 1967 and 1970, in which Israel scored the highest in the world among 12-15 participating countries. But, beginning in 1999, Israelis were shocked to discover that their students did much more poorly than they expected. Israeli opinion leaders as well as the general public now believe that the education system at primary and secondary levels is of low and declining quality.[23] Psychometricians confirm that the tests 1960's and 1970's did not have adequate oversight of sampling frames,[24] and Israeli Arabs as well as immigrants who had arrived up to two years before did not participate in them. Therefore, the nostalgic impression that in the past "things were great" cannot be objectively confirmed. What is clear is that Israel's primary and secondary school students have done relatively poorly in international assessments of learning and achievement since 1999. Box 1 summarizes the nature of these assessments.

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[22] Israel 2028, p. 268.

[23] Recent reports by the Taub Center highlight the learning and achievement issues faced by Israel. A commission report (Dovrat), completed in 2004, recommended a wide variety of reforms, only some of which have been implemented. An NGO, Hakol Chinuch, established a few years ago, lobbies for increased financial support as well as a national curriculum, and a number of other NGOs seek increased financing of schooling for under-privileged groups.

[24] In the international mathematics and reading test in which Israel participated in 1967, Israel was first among 12 participating countries. Israel was also first in a reading test in 1970, in which 15 countries participated. 3336 students from 154 schools were tested in 1967 (Husen 1968). Just a few substitutions or replacements of schools and/or classrooms participating in the exam could have had a major impact on average scores. Recent declines in scores in IDF literacy test scores for entering soldiers cannot be used to confirm that the quality of schooling has gone down, since these tests are not calibrated to allow for comparisons of test difficulty from year to year.

International Achievement Tests

In the 1960's the International Association for the Assessment of Education (IAAE) was formed as a non-profit international agency with membership by countries and educational institutions with the purpose of measuring reading, mathematics, and science achievement in participating countries.

By the early 1990's many countries became interested in comparative achievement tests, in part because of a growing belief that higher order learning and knowledge of a country's labor force could result in increased productivity and hence economic growth (see for example Hanushek and Woessman). Since then increasing numbers of countries participate in IEA studies, especially in the TIMSS (Trends in Mathematics and Science Study), given to fourth and eighth graders, and PIRLS (Progress in Reading and Literacy Study), given to fourth graders, as well as studies on civic education and computer literacy.

In the early 1990s, OECD countries set up the PISA (Progress in Student Achievement) program measuring achievement of 15 year olds in reading, mathematics, and science based less on national curricula and more on an assessment of basic skills and knowledge needed in the labor force. The PISA tests soon were opened to non-OECD countries.

All of these tests are cooperatively designed, and include rigorous oversight of sample survey methodologies and field work, as well as methodologies to ensure that assessments given in different years can be compared. Along with over 50 countries, Israel has been participating since 1999 in the TIMSS eighth grade and PISA assessments of 15 year olds, as well as the PIRLS fourth grade reading assessment and the Civic Education assessment in 2000.

Many teachers, parents, and academics argue that scores on international tests are not a fair measure of the quality of an educational system. They are certainly right that international as well as national tests measure only a small portion of what schools are supposed to do. In fact these tests do not measure achievements in history, arts, music, and foreign language. Except for the civics test, they do not measure attitudinal or behavioral changes which could be brought about by schooling, such as citizenship, creativity, working with others, problem solving, and self-discipline. Furthermore there is a lot of "noise" in test taking, because of the fact that they are based on samples with significant "margins of error." As these tests become more important for countries and for political leaders, the temptation to drill students on sample tests, as well as to bend the rules in something like sampling, can grow. Sometimes students do not do their best on their test, especially if students do not consider them "high stakes." Some argue that a one hour test cannot measure the full set of reading or mathematics skills taught over time, or that the tests measure only rote learning. In fact, at least half of the TIMSS and PISA items require constructed rather than multiple choice responses, and through extensive pilot testing the items have been shown to accurately measure achievement. In short, while assessments of mathematics and language achievement in no way measure the totality of what schools do, to date they are the best measure of comparative quality of an education system.

Since 1999, Israel has scored 50-70 points below the international mean (which now includes a number of developing countries), behind nearly all OECD[25] countries, with the exception of Turkey and Mexico, and lower than expected given its per capita income and the amount of money it spends per student. These tests are based on an international mean of 500 and a "standard deviation" of 100. Country scores range from a high of 560-600 to a low of around 330. Half a standard deviation in scores is often considered the equivalent of a grade year. Table 3 summarizes Israel's overall scores as well as by ethnic group since 1999.

Table 3. Israel's Scores on International Tests, 1999 to 2009

	PISA Math			PISA Reading			TIMSS Math		
	Arabic*	Hebrew*	National	Arabic	Hebrew	National	Arabic	Hebrew	National
1999							397	482	466
2002	344	449	418	378	465	452			
2003							465	505	496
2006	372	460	442	372	456	439			
2007							408	484	463
2009	367	470	447	392	498	474			

*Schools are defined formally as Hebrew speaking or Arabic speaking.
Source: Jewish/Arab breakdowns provided by RAMA based on international reports. National scores are from PISA and TIMSS reports. Scores on the PIRLS 4th grade-reading test were 509 in 2001 and 512 in 2007. Israel's score in science achievement in PISA 2009 was 455.

25 countries (or regions of countries) score 20 points or more than Israel in PISA reading (around the average of Israeli Jewish students)--starting from the highest, Shanghai China, Korea, Finland, Hong Kong China, Canada, New Zealand, Japan, Australia, Netherlands, Belgium, Norway, Estonia, Switzerland, Poland, Iceland, USA, Liechtenstein, Sweden, Germany, Ireland, France, Taiwan, Denmark, United Kingdom, and Hungary. In math, all of these countries, as well as ten additional countries--Lithuania, Latvia, Italy, Spain, Portugal, Luxembourg, Hungary, Czech Republic, Slovakia, and Slovenia--score 20 points or higher than Israel. 39 countries scored 20 points or higher than Israel in PISA science achievement.

Equally important, Israel's students do not do very well on its own internal assessments. The "Meitsav" test shows that on average eighth graders are mastering 36-68% of items based on learning objectives as reflected in the national curriculum, with the lowest scores in mathematics.

[25] The OECD, the Organization for Economic Cooperation and Development, is a cooperative organization of 28 member states which undertakes studies and analyses to improve the economic and social well-being of people around the world. Originally restricted to developed countries of Europe, North America, and Asia, the OECD now includes Mexico (joined in 1994) , Chile (2010), Turkey (1961), Korea (1996), Israel (2010), and six Central and Eastern European countries.

Table 4. Meitsav Scores 2007-2008 for Eighth Grade (percentage of official curriculum mastered)

	Hebrew Education	Arabic Education
Mathematics	46.9	36.4
Language	67.9	58.6
English	46.7	46.9
Science and Technology	59.1	50.8

Source: CBS, Statistical Abstract of Israel, No 62 (2011) Table 8.22

There was an improvement in 2003 on TIMSS, but scores went back close to the level of 1999 in the 2006 eighth grade test. Israel also improved modestly from 2006 to 2009 on PISA. It is likely that these increases were due in part to students being encouraged since 2006 to take the tests more seriously, rather than to real learning improvements. Jewish students alone score below the international average of nearly all OECD countries. Israel does best on reading tests for the fourth grade (PIRLS).[26] Arabs score 75 to 100 points below Jewish students. Arab students in Israel scored better in TIMSS 2007 (404) than West Bank/Gaza (367), Saudi Arabia (329), and Syria (395), but worse than Lebanon (449) and Jordan (427).

Twenty-three percent of all Israeli schoolchildren were not part of the sampling framework for the TIMSS 2007 test, which reflects the lowest participation rate in the world.[27] Ultra-orthodox children do not participate in national and international tests, with the exception of a few girls' schools.[28] Arab residents of East Jerusalem, defined as permanent residents of Israel rather than citizens, continue to follow a Jordanian curriculum and are not tested.

There is a moderate correlation between a country's wealth, as well as its per student expenditures, and the quality of its education system. From this point of view, Israel scores lower than expected compared to its GDP per capita, especially in mathematics (TIMSS 2007). The USA, Italy, and Norway were three countries with similar disappointing results in the 2007 TIMSS. Israel's "competitors," richer countries whose levels of per capita income it aspires to, as well as countries such as Slovakia, Poland, and Estonia, which have lower per capita income than it has, do better in terms of learning achievement in their schools.[29]

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[26] There is evidence that in the past, Israeli students did not take international tests seriously, since they were not "high stakes." In the 2007 TIMSS, Israel had the highest percentage of children among OECD countries that did not complete the test, perhaps because students wanted to leave school early.

[27] TIMSS 2007. Chapter 9, Exhibit 9.4.

[28] Interestingly, the girls' schools in the international test score at around the same level as their secular counterpart. Including ultra-orthodox in international tests might increase reading scores, but lower math and science scores, since most ultra-orthodox do not formally study mathematics and science.

[29] It could be argued that keeping scores relatively stable over the last 12 years is a positive achievement given the increase in the numbers of underprivileged students in schools. "Simpson's paradox" is a statistical situation in which individual sub-groups can improve performance at the same time that performance in an entire population declines. In Israel, while underprivileged students and middle and upper class Jewish students could improve their test scores, the overall country average could decline since there would be a higher percentage of underprivileged students in the system.

Israel's dispersion of scores is among the highest of OECD countries. The differences between the poorest and highest performing students are greater than nearly all OECD countries (just above Mexico, which recently joined the OECD), as can be seen below:

Table 5. International Tests: Score Spreads on PISA 2009

PISA Reading	Israel	OECD	Finland
Top 5%, Average Score	643	637	666
Bottom 5%, Average Score	227	332	382
Point Spread	416	305	284

PISA Math	Israel	OECD	Finland
Top 5%, Average Score	615	643	669
Bottom 5%, Average Score	272	343	399
Point Spread	343	300	270

Source: RAMA PISA Assessments, 2009

What Accounts for the Mediocre Results

Socio-Economic Stumbling Blocks

In Israel, as elsewhere, factors external to the education system have a strong impact on learning. Israel has a large gap in income between the rich and the poor, which is higher than nearly all OECD countries, although comparable to the US. In 2008, 32% of Israeli families, many of them ultra-orthodox or Arab, had gross income below the poverty line.[30] Single parent households, large family size, crime, violence, illiteracy, etc. in Israeli families below the poverty line militate against parental relationships with their children that could lead to increased readiness for learning. Pressures to work in low-income communities lead to school absences and dropout. It could be argued that a more equitable distribution of income could by itself lead to increased learning, since it would reduce family pressures and dislocations.

Children from more educated (or wealthier) families score significantly higher than do those in poorer circumstances. In the PISA test, children from the top quarter of the population in terms of s.e.s. (socio-economic status) scored 100 points higher than did those in lowest quarter.[31] On the Ministry of Education's Meitsav sample test of eighth graders, children in the lowest 20% of s.e.s mastered 36% of the mathematics curriculum compared to 55% in the highest 20%.[32] This can also be seen in the score spread on the international tests described above.

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[30] Ben David, State of the Nation 2009 pp. 41-42. Transfer payments from the state reduce this figure to 19.9%.
[31] PISA 2009, Volume II, p.165
[32] CBS, Statistical Abstract of Israel, No 62 (2011)Table 8.22

Lower education levels affect cultural attitudes, e.g. how parents approach education and the extent to which they provide learning opportunities to their offspring (e.g., reading aloud to young children). Especially in Bedouin areas, parents may be illiterate. Large family size reduces the time available for parents to interact with each child. Written Arabic is disglossic, i.e. it does not reflect colloquial Arabic,[33] so children need, in effect, to learn a "foreign" language for literacy in their native tongue, as well as learning Hebrew (and later English) while they are learning to read. Native Arabic speakers also face a social stumbling block in the low status of the Arabic language, especially in urban areas. Arab boys do more poorly than girls--31.7 compared to 40.7 on the Meitsav mathematics test-- one of the rare cases around the world where boys score significantly lower than girls do in math. There is little available research on why Arab boys do more poorly than do Arab girls.

Jewish minorities such as Ethiopians as well as immigrants from some Central Asian countries face similar disadvantages. Ethiopian students score about three quarters of a standard deviation below other Jewish students.[34] While the gap has been decreasing, "Mizrachi" children (whose families originate from Middle Eastern countries) reportedly do more poorly in schooling than those with European (Ashkenazi) origins.

Inequality in Resource Allocation

Resource allocation is one element that affects learning, although **how** resources are used is as important as their amount. Most OECD countries allocate the same or more resources to disadvantaged schools compared with advantaged schools. The exceptions are Israel, Turkey, Slovenia, and the United States.[35]

Per student public funding in Israel varies in Israel by location as well as by ethnicity. Arab schools are significantly underfunded compared to Jewish schools, although the actual amount of difference is widely debated. Since formal levels of training as well the salaries of Arab teachers are the same as that of Jewish schools, much of the difference in funding comes from differential student-teacher ratios in Arab schools, as can be seen below.

Table 6. Pupils per Class by Type of School, 2008

	Primary student teacher ratio	Primary cost differential based on s/t ratio	Secondary student teacher ratio	Secondary cost differential based on s/t ratio
Arab	31		33	
State	28	+9%	30	+9%
State Religious	24	+23%	25	+26%
Haredi	20	+35%	N.A.	

*Data estimated from Blass, "Education: A Domestic Perspective," fig. 13 and 15.

Disadvantaged schools are reported to have lower levels of educational quality in terms of resources such as physical facilities, books, and school atmosphere.[36] The government is now utilizing a "socio-

[33] Written (classical) Arabic for the most part is not spoken in the modern Arabic world. Learning to read and write in Arabic might be comparable to English speakers having to read and write Chaucerian English.
[34] RAMA. "Ethiopian Students in Israel's Education System."
[35] 2009 PISA Volume II, p. 13.

economic index" to direct funding toward underprivileged areas in the entire country, although it only accounts for 5% of total primary school funding. While these and other recent affirmative action policies have helped to reduce the gap, poorer municipalities as well as parents continue to have inadequate resources compared to Jewish families in more affluent cities.

PISA 2009 confirms that Israeli children with two or more years of pre-schooling score 120 points higher in reading than do those with one year or less of pre-schooling.[37] Middle and upper class parents seek to advantage their children by spending their own funds for expanded pre-schooling during the day, as well as for additional years of pre-schooling.[38] Middle class families spend money on private tutoring and afternoon schooling, especially in primary schools where the state finances the school day only through 1 pm, as well as in preparation for the secondary school leaving examinations ("Bagrut"), a system known as "the grey education market." 52.9% of Israeli 15 year olds report that they receive after-school tutoring in mathematics.[39] Ten percent of all secondary school seniors take "cram courses" for university entrance exams. While recent affirmative actions are having an impact, these opportunities for the most part are not available to poor children.

Teachers and Teaching

Good teachers are an essential component of a well-performing school system. In Israel it is reported that teachers suffer from a decline in prestige and a questioning of their classroom authority.[40] Teachers' salaries (in PPP terms) are lower in Israel than in most OECD countries, although the difference is mitigated by the number of part-time teachers and "bonuses," which are not included in international data. After accounting for adjustments in basic statistics as well as recent increases in teachers' salaries (16-24% through the New Horizons program), teachers' salaries are equivalent to 87% of GDP per capita compared to an average of 116% in OECD countries.[41] Teacher satisfaction with their job is higher in poor townships compared to better-off townships.[42] This difference is likely to be a result of the fact that the cost of living varies greatly while teachers' salaries are uniform nationwide. Research is needed to determine the extent to which teachers have lower learning expectations for disadvantaged children, whether they prepare lesson plans with clear learning objectives, and whether their repertoire of teaching approaches is adequate for different learning goals, as well as for children with different learning needs.

It is also commonly believed that the Israeli classroom is "chaotic," with discipline problems as well as lack of respect for teachers by students as well as parents.[43] The effect of this "chaos" is to reduce time available for learning, since so much time is spent on discipline or on clerical activities. A review of recent studies (Shavit and Blank) suggested that improvements in the level of discipline to the average of other OECD countries (as reported in the TIMSS 2007 study) could reduce the gap between Israeli scores and the OECD average by one quarter.

Other potential reasons for Israel's poor performance could include: (a) Israel's "crowded" curriculum, where students, especially in seventh to tenth grades, take as many as nine subjects, and many subjects are

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[36] 2009 PISA Volume II, p.157
[37] 2009 PISA Volume II, p.97
[38] Recent government efforts to expand compulsory pre-schooling have focused on access for disadvantaged groups.
[39] 2009 PISA Volume IV, p. 237.
[40] Volansky, p. 17.
[41] Blass (5), p. 266.
[42] Blass (1), pp. 190-191.
[43] This is not a problem unique to Israel. Among OECD countries 32% of students report significant noise and disorder in their classroom (PISA IV, p. 91)

offered for the Bagrut; (b) relatively low numbers of hours spent on mathematics and science compared to as other OECD countries; (c) union rules which make it difficult to fire poorly performing teachers; and (d) possibly, a cultural emphasis on children's personal welfare rather than academic excellence, since most children will face two-three years of rigor and possible danger in army service.

V. Israel's Education Reform Initiatives and Challenges

Israeli educational leaders and policy makers, well aware of the challenges, have over the last five years taken significant steps towards education reform, including seeking to improve the quality of teachers, building an effective assessment system, and addressing the problems of disadvantaged students.

This section examines Israel's experience in these areas in the light of international consensuses on "what works." But it should be understood that factors external to every school system account for much of the "variance" in learning achievement. As noted above, poverty, malnutrition, parental illiteracy, indifference, and violence and disruption at home strongly influence how children learn. The best schools can help some, but not all, children to overcome these obstacles. It is also important to recognize that, within and between countries, "inputs" to the schooling process such as funding per student, student teacher ratios, and higher teacher qualifications do not always result in increased learning. As stated by the latest PISA report, "How resources are allocated in schools matters more than overall spending."[44] Education policy should focus not only on equity in "inputs" but also and more importantly, on equity in "outputs" in the form of higher levels of achievement.

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Building a Quality Education System

Improving the Quality of Teachers

What is being done: the New Horizons program. In 2007, the New Horizons program was launched in primary and lower secondary schools. In 2011 the government negotiated with the secondary school union a similar program for upper secondary schools (called "Courage to Change") and implementation is underway. The New Horizons program has the following components:

- Teacher working time in school is increased from 30 to 36 hours per week, which includes four to five hours of small group teaching
- The starting pay for new teachers nearly doubles although growth in pay is flattened out. Promotion is based in part on completion of compulsory additional training, and at senior levels on further assessments.
- A separate and more generous pay scale is introduced to principals, who are given more powers over hiring and firing teachers. A separate training college for principals has been established.
- All primary teachers are supposed to acquire, within the next five years, an academic degree. (There were approximately 17,000 teachers without a degree, mostly older teachers and some new immigrants). Future primary school teachers are now expected to develop areas of expertise in literacy, math, etc.

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[44] 2009 PISA, Volume IV, p. 106.

In addition to this program, the funding formula for teacher training colleges now encourages teacher training colleges to attract good students, since they bring more funding to the college. Efforts are being made to close down smaller and weaker teacher training colleges. An experimental teacher evaluation program is underway. In fact, over the last few years, the formal qualifications of teachers have improved. Applications for teacher colleges have increased, allowing colleges to screen the applicants and choose better candidates, and scores of entering student teachers in entrance exams to higher education have increased over time.[45] This process will likely continue in the next few years.

What remains to be done. High teacher quality, beginning with recruitment, is fundamental to increased learning, but teacher quality is not solely related to salaries. Two of the highest scorers in recent tests, Shanghai, China and Finland, recruit teachers with high knowledge and competence, pay them reasonably well, and then expect these teachers to ensure that every child meets learning objectives on a daily basis. Higher learning expectations, well-structured lesson plans, classroom order, differential approaches to children with different learning needs, and increased "time on task" increase learning. "Time on task" means not only the formal numbers of hours per week devoted to a subject but also how much real time is spent learning in class, as opposed to time spent on clerical tasks and keeping the classroom in order.

The New Horizon program moves in the right direction, increasing salaries, time working in schools, and teacher subject knowledge, and strengthening the role of the principal. While these are important, in the light of international research more should be done if learning is to be increased. The most recent review of progress[46] shows that while teacher satisfaction and school climate have improved, there have been only modest gains in mathematics achievement, and only in the state secular system.

International experience points to the need to encourage the school itself to foster an environment of collaboration, where teachers can share their experiences and mentor weaker peers. It is not clear whether such collaboration has increased in the Israeli context. Because of union opposition, the reform has shied away from teacher evaluation. While not a panacea, a well-functioning school system should have the ability to terminate non-performing teachers when and if efforts to improve their performance do not succeed. Evaluation can also have a positive impact if it is accompanied by an environment for improved teaching. It also appears that not enough of the reform effort focuses on designing and implementing learning standards by grade. The focus on small group learning may be a less effective means of improving the learning process than increased "time on task" within the classroom using differentiated pedagogical approaches International experience has also shown that teacher training colleges often do not "align" their curriculum with national education objectives or policies, which may also be the case in Israel. Given the relatively poor performance of eighth graders in mathematics and science in both PISA and Meitsav tests, training should focus on strengthening teachers' knowledge of mathematical and scientific concepts and of effective pedagogy. Efforts to improve learning of mathematics, science, and language should not be done in such a way as to shortchange attention to social studies, art, music, and other fundamental elements of the learning process.

Israel may wish to consider undertaking structured video studies of how much time is actually spent in the Israeli classroom in active and higher order learning compared to discipline, clerical duties, and routine learning. These studies, which have been undertaken in countries as diverse as Japan, Germany, USA, Chile and Cuba[47] could illuminate the extent to which the "implemented" curriculum is aligned with the formal curriculum. In successful reform efforts around the world, teachers unions have been partners,

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[45] Blass, "Mind the Gap."
[46] RAMA, "Evaluation of the 'New Horizons' Reform."
[47] See Stigler and Hebert, and Carnoy ed.

rather than protagonists, in programs that professionalize and raise the quality of teachers. In addition, teachers' salaries even after the latest improvements are still inadequate to attract the best students.

Israel has high student class ratios compared to OECD countries--27.6:1 compared to 21:1 in OECD countries in primary education[48]. Paradoxically the absolute number of teachers per student is significantly lower—16.9:1, similar to that of the OECD. The reasons for this divergence include teachers working part-time although paid full time, teachers sometimes sharing portions of existing classes, low number of teaching hours per week compared to relatively high student learning hours, especially in secondary education, lower student teacher ratios in small outlying communities, and lower student teacher ratios in ultra-orthodox schools.[49] Israel should therefore seek ways to utilize its existing teaching force more effectively.

Informed Decision Making

What is being done. Until only five years ago, Israel did not have a reliable system of measuring learning progress from year to year. The establishment in 2006 of the National Authority for Measurement and Assessment in education (known by its Hebrew acronym RAMA), an autonomous institute that could measure evaluate and assess education progress, was a major step forward. RAMA now has the technical ability to compare scores on national achievement tests from one year to another. Its main task is to manage the "Meitsav" (Hebrew acronym for "Growth and Efficiency of Measures of Schools"), a set of tests focusing on the core subjects of mathematics, language, English, and science and technology, administered to fifth and eighth grades.[50] An additional test on language reading proficiency is given to second graders.

RAMA also supports teacher and classroom based formative assessments, in part through "school based assessment coordinators" who receive special training. In 2010, RAMA developed a tool for teacher and principal evaluation that is being tested in the field. It is also responsible for measuring the effectiveness of the New Horizons program. One of its mandates is to manage Israel's participation in international tests, and it regularly publishes reports on Israel's performance vis-à-vis other countries. RAMA's leadership recognizes the dangers of excessive focus on test scores, as well as the fact that standardized tests measure a relatively small portion of knowledge gained in school and applied as adults. Its policy is to ensure that "assessment serves the learning process" rather than the opposite.

What remains to be done. A strong system of pedagogic applied research and assessment as well as statistical capability is needed not only to inform curriculum developers, teacher trainers, teachers, parents, and other stakeholders whether policies have had any impact, but also to be used positively in changing classroom practice, revising curriculum, and improving teacher training.[51] In Israel, while there has been progress, more relevant, timely and reader friendly information on learning should be provided to teachers, parents, stakeholders, curriculum developers, teacher trainers, and opinion leaders. Results should be presented in terms not of achievement levels alone but also compared with the expected scores based on children's socio–economic status, to get a better estimate of the "value added" of schooling.

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[48] Ben David, *2010 State of the Nation*, p. 133

[49] Blass (5), pp. 251-263

[50] This section is based on Beller, "Assessment for Learning." Schools are now tested externally once every two years on two of the subject areas. In other years, teachers give "internal Meitsav" tests and are free to use the results for their pedagogical purposes.

[51] "Without data there is only opinion," but it is unfortunate that many education reform efforts around the world are based on faith rather than facts and do not revise reform programs based on feedback from the field.

Teacher training colleges should train teachers to understand and appropriately utilize assessment results. Efforts to evaluate teachers and to train school based assessment coordinators, need to be expanded and generalized.

RAMA may also wish to consider initiating or supporting pilot studies to measure skills and attitudes beyond those of reading, mathematics, and science, such as creativity, artistic knowledge, risk taking, and civic responsibility, including participation in the next round of the IEA Civic Education study.

Ministerial action should not subvert the idea that assessment "serves the learning process." In 2009-10, all eighth graders were required to take additional hours of mathematics studies, with a heavy dose of practice tests, in preparation for the 2010 TIMSS. It is likely that some proportion of any increases in test scores will not be authentic representations of learning achievement of the school population, especially since the 2010-11 eighth graders had neither additional hours nor practice tests and the curriculum has not been changed. The impact could be that parents, teachers, and students alike will take a cynical and counter-productive view of the value of learning assessments.

In addition to assessment results, education statistics, especially enrollment and completion rates, education costs and financing, and information on educational levels in the labor force, play a major role in designing and evaluating education policy. The Central Statistics Bureau provides a set of statistics on enrollments and teachers, but information on education financing, completion rates, enrollment percentages is not readily available. The latest education financing information is from 2007-2008 and is not broken down by education sub-systems. There is no regular publication or analysis of trends of statistics and assessment results. A yearly reader friendly publication of up to date statistics and assessment results, including enrollment and completion rates, financial statistics by education subsystems, and trend analysis, is needed.

As recommended by the NGO Hakol Chinuch,[52] an independent, academic research institute is also needed to assist government educational policy strategists, both in the Knesset and in the Ministry of Education, in the advancement of the education system, through high quality applied research, testing especially the extent to which international best practice can be applied in the Israel context. The Taub Center for Social Policy Studies, a non-profit think tank, has filled part of this gap through its analyses of national and international educational statistics. But the Taub Center is mainly focused on the economics of education and a broader approach is needed, including monitoring the extent to which the Government fulfills its promises and examining what goes on within the classroom as well as in teacher training colleges.

Serving Minorities and the Disadvantaged and Building Social Cohesion

Improving Learning and Achievement among Disadvantaged Minorities

[52] See www.hakoled.org.il

What is being done. The most successful school systems around the world are able to reduce the gap between the lowest and highest performing students. Equity in "inputs' for disadvantaged children — increased money, teachers, materials, classrooms, etc.--is one part of the process. Access to quality early childhood education for underprivileged children, as well as smaller class size in the lower grades, appears to have an especially important long term impact not only on learning but also on social and family stability. Even in the best of conditions, experience has shown that improved learning outcomes of under-privileged children takes a long time.

Israel is making significant "affirmative action" efforts for its disadvantaged groups. In 2008, the Government announced it would initiate programs to raise the basic skills of Arab, Druze and Bedouin children, especially in mathematics, science and English, as well as build new classrooms to meet the needs of the growing Arab population.[53] In 2010 the government pledged additional funding for all Arab third graders to receive supplemental classroom hours in math, science and Arabic, and more tutors were to be assigned to those subjects in 20% of schools. There is more funding to improve Hebrew-language instruction and to reduce school violence and dropout rates in Arab schools. Other programs include strengthening Arabic language skills, developing new syllabuses, and supporting schools that require special attention. Several magnet secondary schools focused on improving Arab performance in science, technology, and math are in place, supported by both the Ministry of Education and by the private sector.[54]

Because of the Government's willingness to encourage local initiatives, as well as external financing, Israel has numerous pilot programs to improve learning among disadvantaged populations. These include an experimental "personal education program" in Bat Yam, intensive literacy for Ethiopian children in Netanya (supported by the Moriah Foundation), pilot programs to establish primary school libraries, a "College for All" program which identifies promising students from poor families and prepares them for entrance into higher education.

A "socio-economic index" is being used to direct funding toward underprivileged areas in the entire country, although it only accounts for 5% of total primary school funding. Within each education system, the Ministry of Education has acted to reduce class size in communities at lower socio-economic levels and to increase instructional hours. In 2008 the Government stated that it would increase pre-schooling to a full day (it currently goes up to 1 pm) and ensure that it was free, with a focus on underprivileged populations.[55] Expanded government support of pre-schooling as well as increased learning opportunities in the afternoon for children aged 3-9 was also the major education recommendation of the Trajtenberg commission convened after the 2011 social protests.

What needs to be done. While the actions Israel has taken recently are positive, it is not certain that the government has adequately followed up its rhetoric with action. For example, DIRASAT, a University of Haifa based think tank, alleged in 2011 that promised school construction efforts in Arab education had not begun. Objective monitoring mechanisms are needed to confirm that Government intentions are followed up with funding, school construction, and enrichment targeted toward difficult populations.

It will be necessary to evaluate the extent to which various interventions have an impact on learning within the poorer communities, keeping in mind that real improvement in learning achievement will take a decade or longer to come to fruition. The focus should be on what actually happens in the classroom to

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[53] Hemmings, p. 19
[54] Kraft, p. 2
[55] This paragraph is based on Hemmings, pp 16-17 and Blass (1), pp. 196-197.

increase learning. Among other subjects, research is needed to identify why Arab boys are underperforming and then to identify appropriate targeted remedial programs. Efforts should also be made to determine how to encourage risk-taking and creativity among disadvantaged youths.

Many programs serving the poor have not been adequately evaluated and some are too costly to replicate. A mechanism is needed to evaluate the cost-effectiveness of these many pilot programs and to expand and generalize the best of them.

PISA 2009 strongly confirms the importance of pre-schooling, since disadvantaged children in Israel with two or more years of pre-schooling increase their reading scores by 90 points. The government's stated commitment to increased pre-schooling should therefore be especially carefully monitored and disadvantaged children should be assured of at least two years of pre-schooling.

Continued efforts are needed to increase the level of educational attainment of minorities, since that will lead to increased learning of children, as can be seen from the results of the Meitsav fifth and eighth grade math tests:

Table 7. Test Scores in Meitsav 2007-8 Math Test by Arab/Jewish and by Mother's Education, as Percentage of Curriculum Mastered

5th Grade Meitsav.

	Mothers with 16+ years education	Mothers with 0-8 years education	Average for All
Arabic	64.6*%	44.2	48.3
Hebrew	71.1	50.2*	63.8

8th Grade Meitsav

	Mothers with 16+ years education	Mothers with 0-8 years education	Total
Arabic	57.2*	32.9	36.4
Hebrew	58.8	30.3*	46.7

Source: CBS, Statistical Abstract, No. 62 (2011), Tables 8.12 & 8.22

* Since these tests were sample based, the scores for Jewish mothers with 0-8 years of education and of Arab mothers with 16+ years of education are subject to a significant margin of error.

In the Meitsav test, Jewish children with mothers who had completed higher education had scores that were virtually the same as Arab mothers with higher education. Scores were also similar when comparing children of mothers with a primary or lower level of education. Based on the Meitsav results, if Arab mothers had the same level of education as Jewish mothers, then most of the discrepancy in scores between Arabs and Jews would disappear.

Building Bridges between the Different Education Streams

Haredi education: what is underway. Recent governments have sought to improve oversight, encourage teaching math, science and English in ultra-orthodox schools, and integrate more Haredim into the economy. In 2008, it was proposed to provide funding to ultra-orthodox schools based on the extent,

to which they taught the common core curriculum, but this approach was not followed through and ultra-orthodox schools now receive 60% of the funds that would be received by an equivalent mainstream school regardless of their curriculum.[56]

Pilot efforts are underway to provide secular schooling, such as law schools, to Haredi males after they have completed studies in the yeshiva, as well as to strengthen schooling for Haredi women, who traditionally study more of the common core curriculum than men and are more likely to enter the labor market. A pilot program to recruit Haredi males to the IDF is underway and recent job fares for Haredi men in Jerusalem have been successful.

What needs to be done. A deeper and more sustained effort at integrating Haredi education into the national education system is needed. Financial incentives should be put in place for the Haredi community to include English, math, and science in the curriculum of their schools, as well as to encourage Haredi men to enter the labor force. A broad based effort is needed to convince the large and growing Haredi electorate that these steps are necessary for their benefit as well as that of the state.

Linking the separate education systems: what is being done. The vast majority of Israelis are likely to continue to prefer to keep their children in separate schools so as to maintain each community's unique identity. Nonetheless, a number of initiatives to link Arabs and Jews, as well as religious and non-religious, mainly supported by NGOs, are underway. The Hand in Hand bilingual Hebrew-Arabic schools in Jerusalem, Wadi Ara, and Kfar Kara and an independent school in Beersheba[57] operate with co-principals, one Arab and one Jewish, classes taught jointly by Jews and Arabs, and students expected to become fluent in both languages.[58] Seeds of Peace sends Jewish and Arab teenagers to a summer camp in Maine where they learn to work together and understand the other's history. Arab teachers are being recruited to work in Jewish schools, especially to teach Arabic, which is a required subject in grades 7-9. An organization (Givat Haviva) sponsors encounters among Arab and Jewish students and teachers in the North. A program managed by AMAL (a non-profit operator of schools) sponsors an English language debating program for Arab and Jewish secondary school students. Curriculum and videos developed at the Center for Education Technology encourage youths to understand the others' experiences. At a mixed Jewish Arab school (Weizmann) in Jaffa, Arab and Jewish artists and musicians teach co-existence and values through the arts. Experiments are reported to link students in "modern orthodox" and secular schools.

In 1999 social studies textbooks were revised to say that Arabs did not simply flee Israel but were driven out, but the current Government has stopped the process of more honest depictions of the experiences of Arab Israelis in Israeli textbooks. Arab groups continue to lobby for a social studies curriculum which more accurately reflects their perceived experiences as citizens of Israel

What needs to be done. Israel's leadership should encourage efforts to link school systems and different ethnic groups. As a model, Hand in Hand works with only a small segment of the population (upper middle class liberal Jews and Arabs), and it is costly, but it plays an important role in building public awareness of the possibilities of collaboration among differing ethnic groups. It is also timely to take advantage of the increased number of spontaneously occurring mixed schools in places like Jaffa, Lod, Haifa, and Nazareth Illit, where Arab students increasingly attend Jewish schools. Efforts at building

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[56] Hemmings, p. 23.

[57] In 2011 the Minister of Education visited a Hand in Hand school and praised its accomplishments.

[58] While the schools receive basic support from the Ministry of Education, costs are twice as high as a traditional school. A recent review (Breit) suggests that the objective of Jewish students becoming fluent in Arabic has not succeeded and Jewish students quit Arabicafter primary education to focus on preparing for the Bagrut.

understanding could include improved teaching of Arabic to Jewish students and Hebrew to Arab students, joint celebration of holidays, learning values through the arts, and understanding common beliefs. Programs linking teenagers, especially those with leadership capabilities, can have a long-term impact in terms of leadership building.

Schools both reflect and reinforce social structures and attitudes, but they also can and ought to be used to create national cohesion. Israel's experience in civic education is not unique. For example the 2008-2009 IEA Civic Education and Citizenship Study examined eighth grade students' knowledge and attitudes about citizenship, democracy, participation, rights and obligations, critical and independent thinking, tolerance, and national institutions in 38 countries (Israel did not participate in this study). Most students endorsed democratic values, gender equality, and equal rights for ethnic or racial groups and immigrants, and many demonstrated knowledge and understanding of civic and citizenship concepts and had the ability to make judgments about the merits of policies and behaviors. However, substantial minorities of students had negative attitudes toward equal opportunities and freedom of movement, and, in some countries, less than full acceptance of democratic values and ideals.

It is likely that the divisions found in the 2000 civics education study, in which Israel participated, between different ethnic and socio-economic groups with regard to citizenship, democracy, and tolerance have increased. National cohesion should be built not simply through strengthening Zionism among Israeli Jews, but also through strengthening within the schools the democratic and pluralistic view embodied in Israel's Declaration of Independence, focusing on building shared values and acceptance of diversity. To strengthen communal understanding and build a stronger common identity, but without calling into question the reasons for the establishment of Israel as a Jewish state, the curriculum should more accurately reflect the experiences of Israel's minorities.

While one impact of linking students and teachers currently in separate school systems could be increased tolerance and understanding, an equally important result could well be to raise learning and achievement for the student population as a whole. As noted earlier, when disadvantaged children in Israel attend schools with more advantaged students, they improve their scores in PISA by 50 points.[59]

The Way Forward

The quality of learning in Israel's primary and secondary schools needs to be significantly improved, especially for Israel's minorities and disadvantaged groups. A divided, atomistic, and unequal school system threatens social stability as well as economic growth. Israel's efforts at education reform are in the right direction but they are inadequate.

Israel's' leadership focuses a great deal of its attention on the "conflict" and on external threats. Yet what Israel does for its children will create tomorrow's adult reality. The challenge is to build an education system that is effective, serves all of Israel's children, enables it to harness its human potential, and helps to build a cohesive society. In a country such as Canada, which has successfully improved learning, consensuses transcended political, ethnic and religious groupings, and there was full support from stakeholders, including teachers unions.[60] Learning improvement benefited from 10-20 years of consistent applied policies based on a "top down/bottom up" approach, with central authorities

[59] PISA 2009 II, p. 94.

[60] See Ontario Ministry of Education, "Reach Every Student: Energizing Ontario Education," for a description of Ontario's education reform program.

articulating clear goals, ensuring equity and measuring results, and schools, teachers, and communities working together to serve their students.

Israel's political system is such that strong national leadership, consensus building, and long term consistent policies are difficult to achieve. But Israel can no longer depend solely on individual and local initiatives or on the creativity of a small percentage of its population to build tomorrow's society. It must find a way to move forward as a nation.

Annex 1. Summary of Issues in Higher Education[61]

While this paper is not intended to review the status of higher education in Israel, it is important to be aware of issues at this level of education since they significantly affect the lower levels. It is reported that inadequate salary levels have led to a "brain drain" of high-level researchers and academics, mostly to the US. Increased tuition makes it difficult for needy students to continue their education (households and students pay 37% of the costs of attending universities and 46% of the costs for colleges). Higher student teacher ratios and inadequate financing of non-salary expenditures are reported to have eroded quality. Underprivileged students enter higher education with inadequate basic knowledge and skills. In response to these problems, the government has recently provided financial incentives for researchers to return to Israel and has increased teacher pay. Affirmative action for underprivileged students, such as a program to strengthen Arab students' capacities in science and technology at the Technion, and the "College for All" program preparing needy students for the Bagrut examination, are growing.

Major challenges include the need for stronger affirmative action to encourage college attendance by minorities, especially in science and technology, a more robust student loan scheme based on international experience, more transparent, flexible, and higher pay scales for teachers, increased attention to colleges and other post-secondary education institutions which the majority of Israel's future secondary school graduates will attend, and building partnerships with the growing numbers of private higher education institutions. In addition, it is reported that the Ministry of Education has inadequate presence and oversight in higher education and there is a lack of a broad vision for the sub-sector.

[61] Based on Hemmings and on US - Israel Science and Technology Commission and Foundation, "Israel 2028: Vision and Strategy for 2028." US - Israel Science and Technology Foundation, Tel Aviv 2008

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