1

Characteristics of High-Achieving and Low-Achieving Schools in Science and Mathematics

Overview

The purpose of this chapter is to search for indicators of school effectiveness by examining those school, class, and student characteristics that distinguish between schools with the highest average achievement and those with the lowest average achievement in science and mathematics at the eighth grade. While variables identified using this approach are not necessarily characteristics of effective schools, this procedure does provide an opportunity to review attributes of high-achieving schools as a prelude to the more analytic approach in Chapter 2.

What Is the Achievement Difference Between the High-Achieving and Low-Achieving Schools in each Country?

The contrast between high- and low-achieving schools is likely to be most informative in countries where the gap between the two groups is greatest. In countries where the differences between schools are small, there are likely to be few variables that can distinguish between high- and low-performing schools. Since the extent of differences between schools is likely to vary across countries, this chapter begins with a brief examination of the differences between the two groups of schools in each country.

Average achievement for eighth-grade students overall, as well as the mean for the highest-achieving one third and the lowest-achieving one third of the schools in the sample for each country and the difference between these two groups, is shown in Exhibits 1.1 and 1.2 for science and mathematics, respectively. These exhibits show that while the average achievement of the high- and the low-achieving schools clearly differs in every country in both subjects, the difference in some countries is very much greater than in others. In science, the difference ranges from as little as 51 scale score points in Japan to as much as 138 points in Germany and Singapore. In mathematics, the range is slightly greater, from a low of 56 in Iran to a high of 152 in the Netherlands. Although differences between the high- and low-achieving schools were slightly greater in mathematics than in science, generally countries with a big difference in mathematics also had a big difference in science. Belgium (both French and Flemish parts) and Sweden were exceptions to this, with considerably smaller differences in science than in mathematics.

It might be expected that the smallest differences between high- and low-achieving schools would be in countries where the average achievement was generally low; and while that was true in countries such as Colombia, Cyprus, Iran, Latvia(LSS), Lithuania, Portugal, and Romania, it was not always the case. Japan and Korea were among the highest-achieving countries in both mathematics and sci-

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Exhibit 1.1 Average Science Achievement for all Students, and for Students in the Lowest-Achieving and Highest-Achieving Schools at the Eighth Grade*

Country	Average Science Achievement All Schools	Average Science Achievement Lowest Achieving Third of Schools	Average Science Achievement Highest Achieving Third of Schools	Difference Between Highest and Lowest Third of Schools
Australia	545 (3.9)	494 (4.6)	600 (3.7)	106 (5.9)
Austria	558 (3.7)	509 (6.6)	624 (3.5)	115 (7.4)
Belgium (Fl)	550 (4.2)	509 (4.9)	600 (2.3)	91 (5.4)
Belgium (Fr)	471 (2.8)	429 (3.0)	519 (2.0)	89 (3.6)
Canada	531 (2.6)	480 (2.2)	566 (2.3)	86 (3.2)
Colombia	411 (4.1)	373 (3.8)	453 (3.6)	80 (5.2)
Cyprus	463 (1.9)	435 (2.8)	493 (3.1)	58 (4.2)
Czech Republic	574 (4.3)	531 (3.6)	611 (5.2)	80 (6.3)
England	552 (3.3)	500 (2.2)	605 (4.2)	105 (4.7)
France	498 (2.5)	466 (4.0)	531 (2.8)	65 (4.9)
Germany	531 (4.8)	456 (5.8)	594 (2.9)	138 (6.4)
Hong Kong	522 (4.7)	467 (4.7)	574 (3.6)	108 (5.9)
Hungary	554 (2.8)	512 (3.5)	592 (2.6)	80 (4.3)
Iceland	494 (4.0)	460 (4.2)	526 (4.0)	66 (5.8)
Iran, Islamic Rep.	470 (2.4)	439 (2.3)	500 (2.6)	61 (3.4)
Ireland	538 (4.5)	465 (5.2)	595 (3.0)	130 (6.0)
Japan	571 (1.6)	546 (1.6)	596 (2.7)	51 (3.2)
Korea	565 (1.9)	533 (2.1)	594 (2.1)	61 (2.9)
Latvia (LSS)	485 (2.7)	450 (2.9)	520 (2.7)	70 (4.0)
Lithuania	476 (3.4)	434 (2.8)	520 (4.3)	87 (5.1)
Netherlands	560 (5.0)	502 (5.2)	616 (3.6)	114 (6.4)
New Zealand	525 (4.4)	464 (3.3)	583 (3.7)	119 (5.0)
Norway	527 (1.9)	498 (2.8)	553 (1.9)	54 (3.4)
Portugal	480 (2.3)	449 (2.1)	509 (2.3)	60 (3.2)
Romania	486 (4.7)	421 (3.6)	555 (4.4)	135 (5.6)
Russian Federation	538 (4.0)	481 (2.3)	588 (3.5)	108 (4.2)
Scotland	517 (5.2)	461 (3.8)	571 (6.2)	110 (7.2)
Singapore	607 (5.5)	530 (2.9)	669 (4.2)	138 (5.1)
Slovak Republic	544 (3.2)	504 (2.2)	588 (3.8)	84 (4.4)
Slovenia	560 (2.5)	531 (2.1)	589 (3.0)	58 (3.6)
Spain	517 (1.7)	485 (1.9)	546 (1.6)	60 (2.5)
Sweden	535 (3.0)	501 (2.7)	567 (2.7)	67 (3.8)
Switzerland	522 (2.5)	467 (3.3)	578 (2.4)	112 (4.1)
United States	534 (4.7)	458 (3.8)	585 (3.1)	126 (4.9)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedure (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

Exhibit 1.2 Average Mathematics Achievement for all Students, and for Students in the Lowest-Achieving and Highest-Achieving Schools at the Eighth Grade*

Country	Average Mathematics Achievement All Schools	Average Mathematics Achievement Lowest Achieving Third of Schools	Average Mathematics Achievement Highest Achieving Third of Schools	Difference Between Highest and Lowest Third of Schools
Australia	530 (4.0)	453 (2.5)	604 (3.8)	151 (4.5)
Austria	539 (3.0)	489 (4.3)	618 (2.5)	129 (5.0)
Belgium (Fl)	565 (5.7)	492 (5.3)	637 (3.0)	145 (6.1)
Belgium (Fr)	526 (3.4)	460 (6.1)	583 (2.5)	123 (6.6)
Canada	527 (2.4)	476 (3.3)	564 (3.4)	88 (4.8)
Colombia	385 (3.4)	351 (3.3)	425 (3.7)	74 (5.0)
Cyprus	474 (1.9)	440 (1.9)	507 (2.3)	67 (3.0)
Czech Republic	564 (4.9)	509 (2.8)	612 (6.4)	103 (7.0)
England	506 (2.6)	461 (2.1)	555 (4.7)	94 (5.2)
France	538 (2.9)	492 (3.8)	581 (3.6)	88 (5.3)
Germany	509 (4.5)	438 (3.8)	578 (3.2)	140 (4.9)
Hong Kong	588 (6.5)	508 (7.4)	660 (4.4)	151 (8.6)
Hungary	537 (3.2)	489 (3.1)	584 (2.9)	95 (4.2)
Iceland	487 (4.5)	450 (5.2)	519 (5.3)	69 (7.4)
Iran, Islamic Rep.	428 (2.2)	400 (2.7)	455 (2.2)	56 (3.5)
Ireland	527 (5.1)	448 (3.8)	592 (3.5)	144 (5.1)
Japan	605 (1.9)	574 (2.2)	638 (2.3)	64 (3.2)
Korea	607 (2.4)	568 (2.5)	646 (2.9)	78 (3.8)
Latvia (LSS)	493 (3.1)	450 (3.1)	533 (3.9)	83 (5.0)
Lithuania	477 (3.5)	428 (2.5)	526 (3.8)	98 (4.5)
Netherlands	541 (6.7)	465 (7.3)	617 (5.6)	152 (9.2)
New Zealand	508 (4.5)	447 (3.6)	569 (4.6)	122 (5.8)
Norway	503 (2.2)	472 (2.1)	531 (2.6)	59 (3.4)
Portugal	454 (2.5)	426 (1.5)	485 (2.7)	59 (3.1)
Romania	482 (4.0)	420 (2.3)	543 (3.3)	123 (4.1)
Russian Federation	535 (5.3)	469 (2.1)	588 (4.0)	119 (4.5)
Scotland	499 (5.5)	444 (3.3)	552 (6.6)	108 (7.4)
Singapore	643 (4.9)	570 (3.3)	698 (3.0)	129 (4.5)
Slovak Republic	547 (3.3)	505 (2.1)	595 (4.9)	90 (5.3)
Slovenia	541 (3.1)	506 (2.3)	574 (3.8)	68 (4.4)
Spain	487 (2.0)	453 (2.2)	521 (2.5)	68 (3.3)
Sweden	519 (3.0)	449 (3.8)	562 (2.4)	113 (4.5)
Switzerland	545 (2.8)	480 (4.1)	611 (1.9)	131 (4.5)
United States	500 (4.6)	421 (2.1)	563 (3.8)	142 (4.3)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedure (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

continued from page 15

ence, and yet the high- and low-achieving schools differ very little, in relative terms. This implies that these countries not only have high achievement on average, but that this high achievement is characteristic of most, if not all, of their schools.

Several countries with high average achievement, including Belgium (Flemish), the Czech Republic, Hong Kong, and Singapore in mathematics, and Austria, the Netherlands, and Singapore in science, had comparatively large differences in the achievement levels of the high- and low-achieving schools. All of these countries employ some form of streaming or tracking for eighth-grade students, either within schools or between school types.

What are the Distinguishing Characteristics of High- and Low- Achieving Schools?

As described in the introduction, all TIMSS variables pertaining to school, teacher, and student factors were first screened to identify those that were associated with student achievement in mathematics or science. The variables that survived this initial screening were further examined to isolate those that discriminated between high-achieving and low-achieving schools (see Appendix A for more details). The surviving variables were grouped into the following six categories:

- *Home Background*. This category consists of variables that are indicative of material and literacy resources in the home, including having a range of family possessions, a selection of study aids, lots of books, and having parents with high levels of education.

- *Home-School Interface*. Included here are variables that may be influenced by both home and school factors, such as student aspirations and maternal and peer pressure for achievement.

- *School Size and Location*. These variables operate at the school level. They include the degree of urbanicity of the school, and the size of the school and of the class sampled.

- *School Social Climate*. The school social climate consists of factors that are conducive to a safe, orderly, and productive learning environment. Included are school discipline problems, both "administrative" problems such as dress code violations and more serious misbehavior.

- *Student Attitude towards Science or Mathematics*. This category consists of student attitudinal factors, including attitude towards science, attitude towards mathematics, and a belief in the efficacy of science.

- *Instructional Activities in Science or Mathematics Class.* This includes variables that describe aspects of classroom instruction, such as frequency of experiments in science, and the frequency with which the teacher checks homework in mathematics.

Home Background

Previous studies of schools effectiveness[1] have emphasized the need to take into account the effects of student home background and the composition of the student body when studying the effects of school factors on achievement. Student home background in this context includes not only socioeconomic factors, but also indices of parental emphasis on and support for academic achievement.[2]

In the present study the home background category includes indicators of both academic emphasis and socioeconomic status. There are five variables in all:

- number of books in the home
- presence of study aids (dictionary, study desk, computer)
- possessions in the home
- level of educational attainment of parents
- number of hours spent working at home

Books in the Home

The number of books in the home is a very useful indicator of home literacy support, and is one of the few variables that correlates positively with student achievement in practically all TIMSS countries. Common sense would support the notion that educational benefits flow from the availability of a range of reading materials within students' homes. Students can strengthen and deepen their understanding of concepts covered in class through the use of encyclopedias and other reference books at home; and more generally, a wide range of reading material at home can be thought to foster academic interests and serve to encourage learning.

Students were asked to estimate the number of books in their homes. This variable discriminated very effectively between high-achieving and low-achieving schools. In almost all countries, as shown in Exhibits 1.3 and 1.4, substantially greater percentages of students in the high-achieving schools reported having at least 100 books at

[1] Coleman, J. (1966). *Equality of Educational Opportunity.* Washington, U.S. Government Printing Office.

Jencks, C. S., Smith, M., Acland, H., Bane, M. J., Cohen, D., Ginter, H., Heyns, B., and Michelson, S. (1972). *Inequality: A Reassessment of the Effect of the Family and Schooling in America.* New York: Basic Books.

Blakey, L.S., and Heath, A.F. (1992). "Differences Between Comprehensive Schools: Some Preliminary Findings." In D. Reynolds and P. Cuttance (Eds.) *School Effectiveness: Research, policy and practice.* London: Cassell.

[2] Hanson, S.L., and Ginsburg, A.L. (1988). "Gaining Ground: Values and High School Success," *American Educational Research Journal*, Vol. 25, 334-365.

homes. This difference was significant in all countries except Iceland, Iran, and Latvia for science, and Canada, Iceland, Iran, and Hong Kong for mathematics. Across countries, the average difference was 23 percentage points for both mathematics and science.

In many countries, the percentage of students that reported having at least 100 books at home was indeed much higher among high-achieving schools. For example, in Austria, England, Germany, the Netherlands, Scotland, Switzerland, and the United States, the percentage of students in the high-achieving schools in science that reported having at least 100 books was more than twice the percentage in the low-achieving schools. In mathematics, the situation was similar, with these seven countries also among those with the greatest difference in book ownership.

Not surprisingly, perhaps, the countries with the greatest difference in book ownership between high- and low-achieving schools also had very large differences in mean achievement in science and mathematics between the two groups of schools. Conversely, the 15 countries with the smallest disparities in the percentages of students with at least 100 books also had relatively small differences between the high- and low-achieving schools in science achievement. A notable exception to this trend was Hong Kong.[3] A similar trend was noticeable in the mathematics results, although here the exceptions were Belgium (Flemish), the Czech Republic, Hong Kong, Singapore, and Sweden, where the difference in book ownership was small, but the achievement difference was large.

Study Aids in the Home

The availability of specific resources that promote learning in the home can help develop a positive attitude toward learning and enhance study practices. The presence of a study desk, dictionary, and computer are indicators not only of the importance placed upon education, but also of the economic resources available to the family. Taken together, the presence of these study aids in students' homes serves as a powerful discriminator between high- and low-achieving schools, second only to the number of books in the family home in this study.

The percentages of eighth-grade students having all three study aids (study desk, dictionary, and computer) in their homes are presented in Exhibits 1.5 and 1.6 for science and mathematics, respectively. For most countries, significantly greater percentages of students in the high-achieving schools reported having all three aids than did students in the low-achieving schools. The difference was most pronounced in Hungary, Singapore, and the United States. The average difference was 14 percentage points for both science and mathematics.

[3] In Hong Kong, high population density and high property values combine to keep living quarters and storage space small, and consequently, high levels of book ownership are not usual.

Possessions in the Home

The material possessions of a family can be a useful indicator of the socioeconomic status of the family. The student questionnaire included a section in which each country presented a list of items that would be likely to be found in the homes of affluent families in that country. Students were asked to indicate which of the items they had in their own homes. The list varied from country to country; for example, the Swedish list had 12 items, including a sauna, a video camera, a sail or motor boat, and access to a summer house. Norway also had 12 items, but included both educational supports (an encyclopedia, an atlas, and a globe) and recreational elements (video camera, more than one TV, and more than one car).

Exhibits 1.7 and 1.8 show the percentages of students in the high- and low-achieving schools in each country that reported having in their homes at least half of the items on the list for their country. Across countries, the average difference was 11 percentage points for both science and mathematics. The greatest differences between the high- and low-achieving schools were found in Colombia and Singapore. Countries with no significant difference in either science or mathematics included Canada, the Czech Republic, Hong Kong, Iceland, Lithuania, Norway, Romania, Slovenia, and Sweden.

Educational Attainment of Parents

Homes where parents have attained a high level of education are likely to place high value on academic achievement in children, and to be relatively affluent. As reported in Exhibits 1.9 and 1.10, in almost all countries significantly greater percentages of students in the high-achieving schools reported that they had at least one parent who had completed a university education, than did students in the low-achieving schools. The average difference was 17 percentage points in science and 18 points in mathematics. The four countries with the greatest differences in both mathematics and science included Australia, Belgium (both Flemish and French), Hungary, and the Russian Federation. Countries with no significant difference in either mathematics or science included Iceland, Iran, and Norway.

Students Doing Jobs at Home

However desirable it may seem that children perform their share of household chores, and regardless of the intuitive notion that such activities foster children's development, the TIMSS data show a negative association in most countries between time spent on chores and student achievement. It seems that, despite the positive aspects of children helping in the home, a student who spends considerable time doing household chores is less likely to have time available for study, and that spending as little as one hour per day in such activities may be associated with lower achievement in mathematics and science.

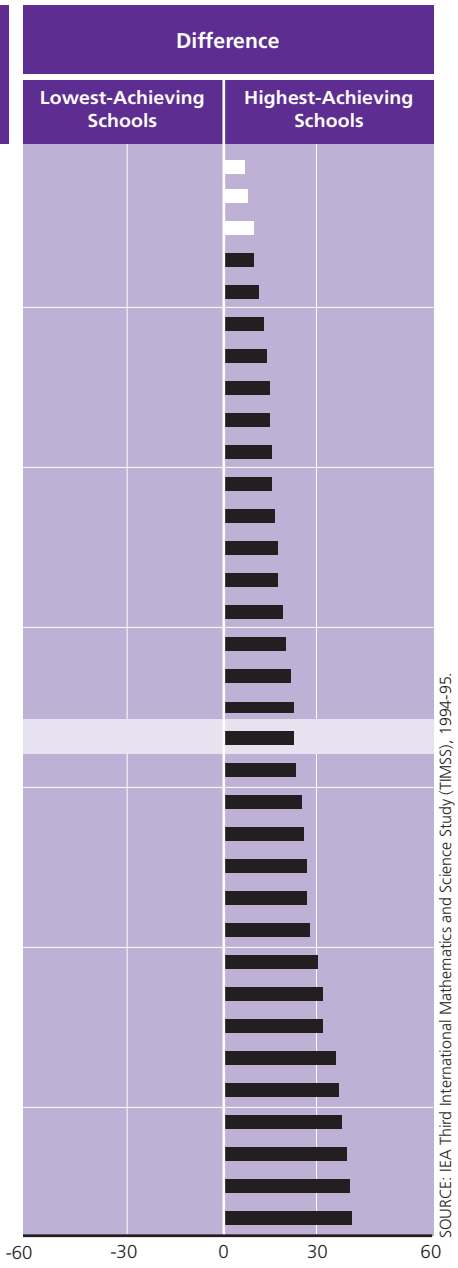
In many countries, significantly greater percentages of students in the low-achieving schools reported that they spent one or more hours daily working at home than did students in the high-achieving schools (see Exhibits 1.11 and 1.12). On average across countries, the difference was greater by 9 percentage points in science and 11 points in mathematics. The difference was particularly pronounced in Singapore, and was also large in Belgium (Flemish and French), the Netherlands, and Switzerland for both science and mathematics. These countries also had large differences in average mathematics achievement (120 points or more) and at least moderate differences in science achievement (89 points or more).

Exhibit 1.3 - 1.12 Overleaf

Exhibit 1.3

Percent of Students Having at Least 100 Books in the Home
Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Iran, Islamic Rep.	12 (1.8)	18 (2.2)	6 (2.8)
Latvia (LSS)	75 (2.3)	82 (1.4)	8 (2.7)
Iceland	62 (3.4)	71 (1.9)	9 (3.9)
Norway	61 (1.4)	71 (1.9)	10 (2.3)
Hong Kong	14 (1.5)	25 (2.9)	11 (3.3)
Colombia	11 (1.9)	24 (2.9)	13 (3.5)
Slovenia	38 (2.8)	52 (2.2)	14 (3.6)
Cyprus	35 (2.0)	50 (1.5)	15 (2.5)
Sweden	56 (2.6)	71 (2.1)	15 (3.4)
Belgium (Fl)	31 (1.6)	47 (2.3)	16 (2.8)
France	34 (2.9)	50 (3.3)	16 (4.4)
Korea	37 (2.2)	53 (2.3)	17 (3.2)
Slovak Republic	34 (2.3)	51 (2.9)	17 (3.7)
Canada	48 (2.2)	65 (2.0)	18 (3.0)
Czech Republic	57 (1.7)	76 (2.6)	19 (3.1)
Romania	25 (3.2)	45 (4.8)	20 (5.8)
Australia	56 (2.0)	78 (1.4)	22 (2.5)
Singapore	15 (1.3)	37 (2.1)	22 (2.5)
International Avg.	36 (0.4)	59 (0.4)	23 (0.6)
Portugal	21 (2.0)	44 (2.9)	23 (3.5)
Spain	34 (2.6)	59 (2.3)	25 (3.5)
Russian Federation	37 (2.9)	63 (3.0)	26 (4.2)
Lithuania	31 (2.0)	58 (2.5)	26 (3.2)
Ireland	29 (1.9)	55 (2.7)	27 (3.3)
New Zealand	52 (2.2)	80 (1.6)	27 (2.7)
Belgium (Fr)	40 (1.5)	71 (2.5)	30 (2.9)
Hungary	46 (2.5)	78 (2.2)	32 (3.4)
United States	32 (2.0)	64 (1.8)	32 (2.7)
Netherlands	24 (2.2)	61 (2.9)	37 (3.6)
England	36 (2.3)	73 (2.4)	37 (3.3)
Austria	27 (2.1)	65 (3.9)	38 (4.5)
Scotland	23 (2.0)	62 (3.4)	39 (3.9)
Germany	31 (2.9)	72 (2.1)	41 (3.5)
Switzerland	27 (2.3)	68 (1.8)	41 (3.0)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

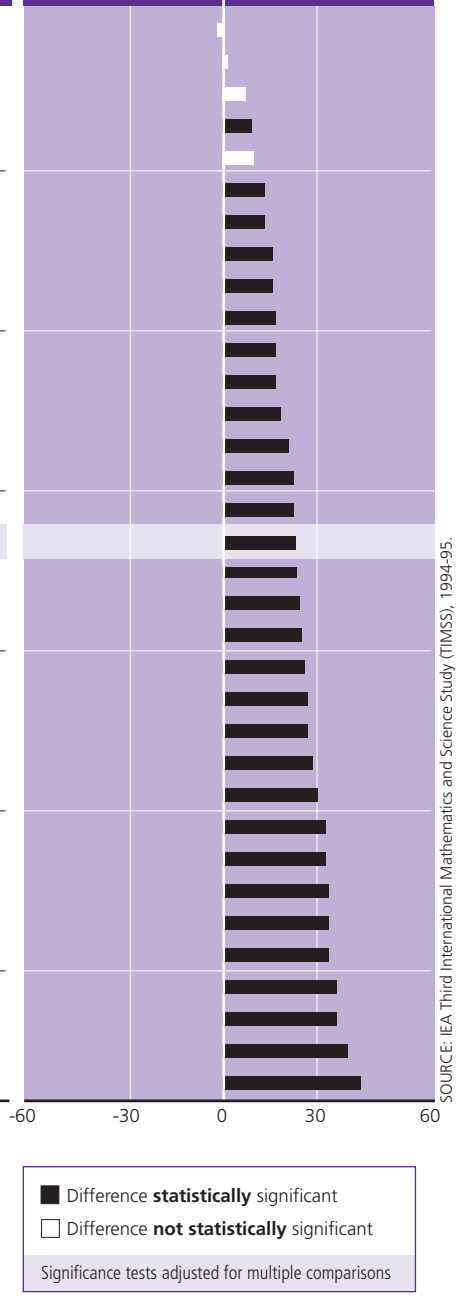
Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

Japan: Question not administered or data not available.

Exhibit 1.4

Percent of Students Having at Least 100 Books in the Home
Schools with the Lowest and Highest Achievement – Eighth Grade* – Mathematics

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Canada	56 (3.0)	54 (1.8)	-2 (3.5)
Iceland	67 (2.9)	69 (2.2)	2 (3.8)
Iran, Islamic Rep.	11 (1.3)	19 (2.3)	8 (2.9)
Norway	61 (1.5)	71 (2.0)	9 (2.5)
Hong Kong	15 (1.6)	25 (3.1)	11 (3.6)
Latvia (LSS)	70 (2.7)	84 (1.5)	14 (2.9)
Colombia	10 (2.1)	24 (3.0)	14 (3.7)
Slovenia	34 (2.5)	51 (2.6)	16 (3.8)
Belgium (Fl)	30 (2.1)	47 (2.2)	17 (3.0)
Slovak Republic	35 (2.5)	52 (2.7)	17 (3.9)
Cyprus	33 (1.6)	51 (1.8)	17 (2.4)
France	33 (2.7)	51 (3.1)	18 (4.2)
Czech Republic	56 (2.0)	75 (3.9)	19 (4.4)
Singapore	15 (1.4)	36 (2.2)	21 (2.8)
Sweden	51 (2.6)	74 (2.1)	23 (3.3)
Korea	33 (2.3)	56 (2.1)	23 (3.1)
International Avg.	35 (0.4)	59 (0.5)	23 (0.6)
Australia	54 (1.4)	78 (1.3)	24 (1.8)
New Zealand	53 (2.4)	78 (1.9)	25 (3.1)
Portugal	21 (1.9)	46 (2.8)	25 (3.5)
Ireland	28 (1.9)	55 (2.7)	27 (3.3)
Spain	33 (2.3)	60 (2.6)	27 (3.3)
Russian Federation	34 (2.6)	61 (4.2)	28 (5.9)
Lithuania	28 (1.8)	58 (2.7)	29 (3.3)
Romania	20 (2.7)	51 (4.7)	31 (5.4)
Hungary	46 (2.8)	79 (2.2)	33 (3.7)
Belgium (Fr)	35 (2.3)	69 (2.2)	34 (3.2)
United States	32 (1.8)	66 (1.7)	34 (2.5)
England	36 (2.0)	71 (2.7)	34 (3.3)
Switzerland	28 (2.6)	62 (2.1)	35 (3.4)
Netherlands	25 (2.3)	62 (2.7)	37 (3.6)
Scotland	26 (2.0)	63 (3.2)	37 (3.9)
Austria	26 (2.1)	67 (3.1)	41 (3.8)
Germany	29 (2.2)	73 (2.0)	44 (3.0)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

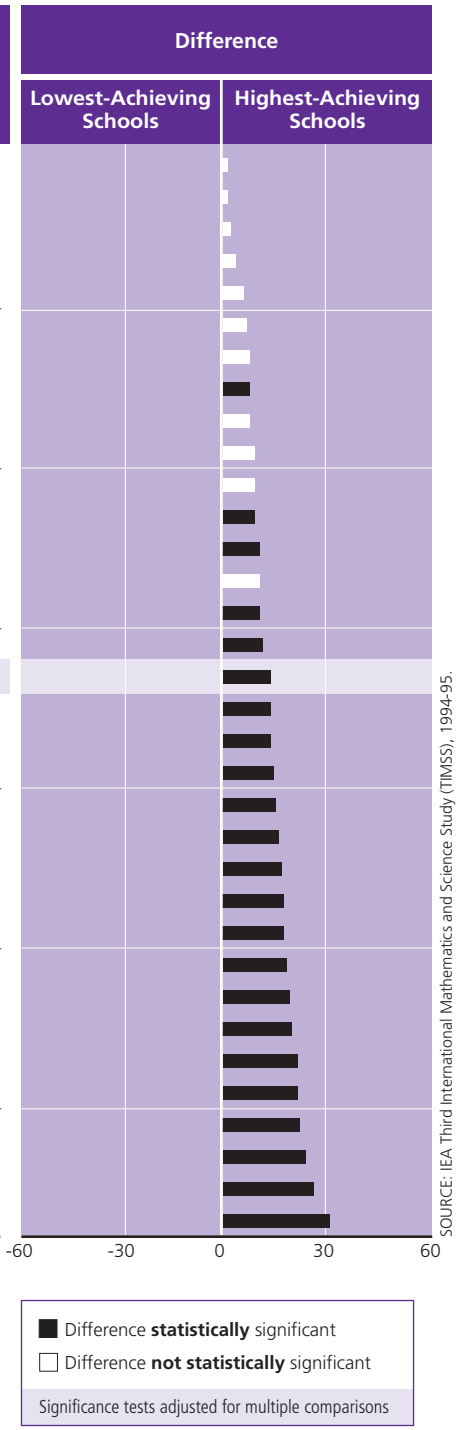
Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

Japan: Question not administered or data not available.

Exhibit 1.5

Percent of Students Having a Study Desk, Dictionary, and Computer in the Home
Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Latvia (LSS)	13 (1.6)	14 (1.5)	1 (2.2)
Iran, Islamic Rep.	1 (0.3)	2 (0.6)	2 (0.7)
Iceland	71 (3.9)	73 (2.0)	2 (4.3)
Norway	59 (1.9)	63 (2.3)	4 (3.0)
Netherlands	81 (3.1)	88 (1.4)	7 (3.4)
Lithuania	30 (2.5)	38 (2.2)	7 (3.3)
France	44 (2.5)	52 (2.0)	8 (3.2)
England	77 (1.7)	85 (1.6)	8 (2.4)
Czech Republic	29 (2.3)	37 (2.5)	8 (3.5)
Russian Federation	26 (2.6)	35 (2.2)	9 (3.4)
Slovak Republic	22 (1.6)	31 (2.7)	9 (3.1)
Romania	3 (0.7)	13 (2.4)	10 (2.5)
Sweden	54 (2.6)	65 (2.2)	11 (3.4)
Colombia	6 (2.4)	17 (2.6)	11 (3.5)
Slovenia	38 (2.4)	50 (2.4)	12 (3.4)
Germany	58 (1.9)	71 (1.6)	12 (2.5)
International Avg.	40 (0.4)	54 (0.4)	14 (0.5)
Scotland	65 (2.5)	79 (1.7)	14 (3.0)
Ireland	59 (2.9)	73 (2.2)	14 (3.7)
Austria	52 (2.3)	68 (2.8)	15 (3.6)
Australia	59 (2.3)	75 (2.1)	16 (3.1)
Belgium (Fr)	51 (2.1)	67 (1.5)	17 (2.6)
Canada	46 (2.9)	64 (1.9)	17 (3.5)
Spain	32 (2.2)	50 (2.4)	18 (3.2)
Switzerland	53 (1.8)	71 (1.7)	18 (2.5)
New Zealand	47 (2.1)	66 (2.3)	19 (3.1)
Belgium (Fl)	55 (1.7)	75 (1.5)	20 (2.3)
Cyprus	27 (1.7)	48 (1.2)	21 (2.1)
Hong Kong	23 (1.5)	46 (3.2)	22 (3.5)
Korea	28 (1.8)	50 (2.0)	23 (2.7)
Portugal	24 (2.2)	47 (3.0)	23 (3.8)
Singapore	33 (1.7)	58 (2.6)	25 (3.1)
Hungary	17 (1.5)	45 (2.7)	27 (3.1)
United States	37 (1.9)	69 (1.7)	32 (2.6)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

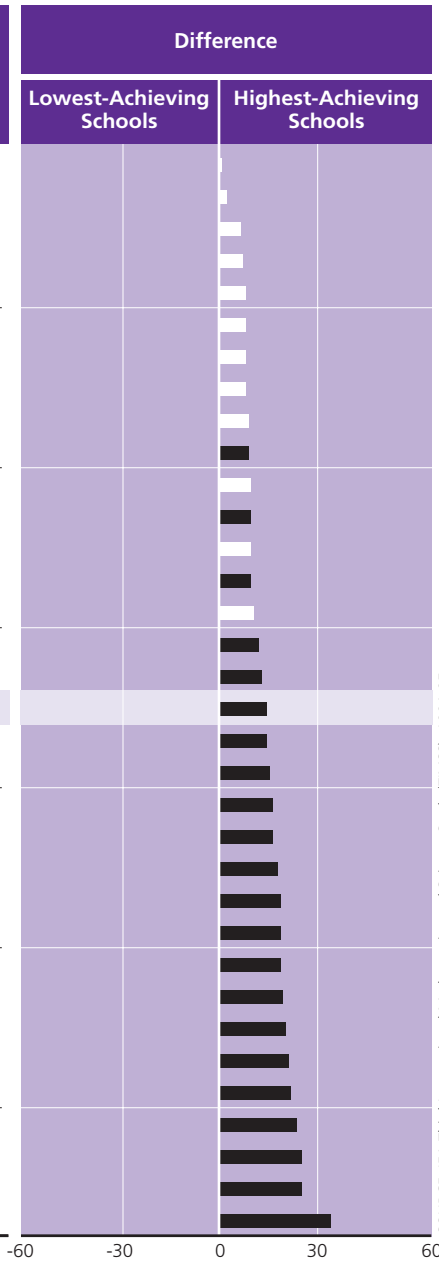
Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

Japan: Question not administered or data not available.

Exhibit 1.6 Percent of Students Having a Study Desk, Dictionary, and Computer in the Home

Schools with the Lowest and Highest Achievement – Eighth Grade* – Mathematics

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Latvia (LSS)	11 (1.5)	12 (1.4)	1 (2.2)
Iran, Islamic Rep.	1 (0.3)	3 (0.8)	2 (0.8)
Iceland	68 (3.8)	74 (2.0)	6 (4.4)
Norway	59 (2.1)	66 (1.8)	8 (2.8)
Canada	50 (1.8)	58 (2.3)	8 (2.6)
France	44 (2.5)	52 (2.4)	8 (3.6)
Netherlands	80 (3.2)	88 (1.5)	8 (3.5)
Russian Federation	24 (2.2)	33 (3.1)	8 (4.3)
Slovak Republic	22 (1.8)	32 (2.7)	9 (3.3)
Germany	62 (2.0)	71 (1.6)	9 (2.7)
Lithuania	29 (2.3)	39 (2.2)	10 (3.4)
Romania	4 (0.7)	14 (2.3)	10 (2.4)
Colombia	7 (2.5)	17 (2.6)	10 (3.6)
England	75 (1.9)	86 (1.5)	10 (2.4)
Scotland	68 (2.8)	78 (1.8)	10 (3.5)
Slovenia	36 (2.2)	48 (2.6)	12 (3.6)
Czech Republic	24 (2.1)	38 (2.4)	13 (3.4)
International Avg.	40 (0.4)	54 (0.4)	14 (0.6)
Ireland	59 (2.9)	74 (2.1)	15 (3.8)
Austria	55 (2.6)	70 (2.0)	15 (3.3)
Cyprus	30 (2.1)	47 (1.5)	16 (2.4)
Spain	33 (2.1)	49 (2.6)	17 (3.5)
Switzerland	53 (2.0)	70 (1.6)	18 (2.5)
Sweden	46 (2.0)	65 (2.0)	19 (2.7)
Belgium (Fr)	47 (2.6)	66 (2.3)	19 (3.7)
Belgium (Fl)	54 (1.9)	74 (1.7)	19 (2.5)
Portugal	28 (2.7)	48 (2.7)	20 (4.1)
Australia	56 (2.0)	76 (1.3)	21 (2.3)
Korea	28 (1.9)	50 (2.1)	22 (2.9)
New Zealand	45 (2.1)	67 (2.5)	22 (3.4)
Hong Kong	22 (1.4)	46 (2.7)	24 (3.0)
Singapore	33 (1.9)	58 (2.4)	25 (3.3)
Hungary	20 (1.9)	46 (2.9)	26 (3.7)
United States	36 (2.2)	71 (1.6)	35 (2.8)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

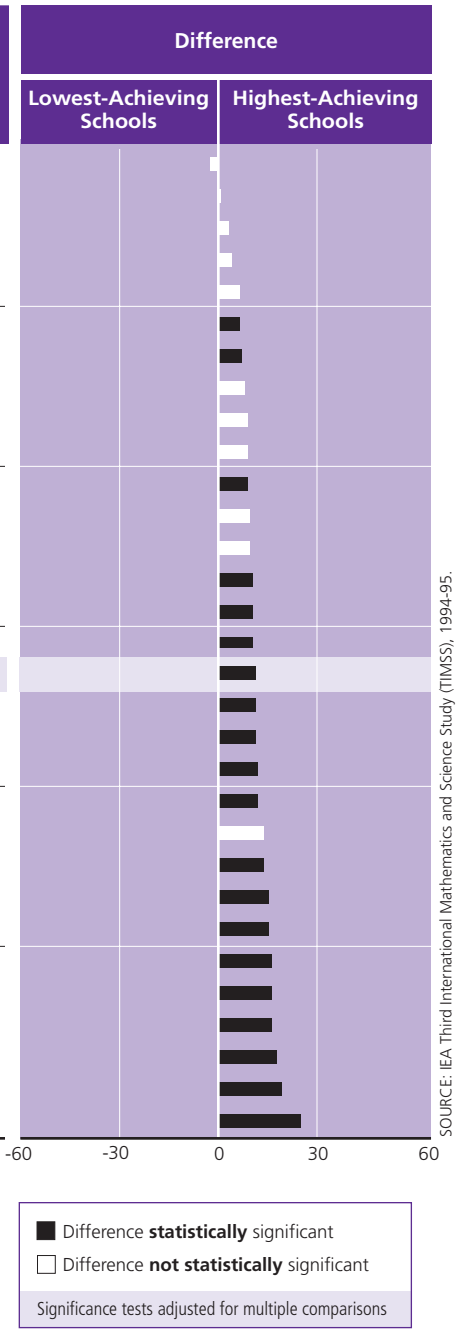
Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking classrooms only.

Japan: Question not administered or data not available.

Exhibit 1.7 Students' Report of Possessions in the Home[1]

Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Canada	52 (2.2)	50 (1.7)	-2 (2.7)
Norway	63 (1.8)	63 (1.7)	1 (2.5)
Slovenia	77 (1.9)	80 (2.0)	4 (2.7)
Hong Kong	48 (1.7)	52 (2.6)	4 (3.1)
Czech Republic	22 (2.0)	29 (2.1)	6 (2.9)
Russian Federation	9 (1.0)	15 (1.6)	7 (1.9)
Slovak Republic	79 (1.8)	86 (1.4)	7 (2.3)
Iceland	34 (3.5)	42 (2.7)	8 (4.4)
England	81 (2.3)	89 (1.8)	9 (2.9)
Lithuania	59 (2.8)	68 (2.0)	9 (3.4)
Belgium (Fr)	82 (2.0)	91 (1.1)	9 (2.3)
Latvia (LSS)	66 (2.5)	76 (2.7)	10 (3.7)
Sweden	54 (3.9)	64 (2.2)	10 (4.4)
New Zealand	67 (1.9)	77 (1.7)	10 (2.5)
Ireland	82 (1.8)	93 (1.1)	10 (2.2)
Korea	73 (1.9)	84 (2.1)	10 (2.9)
International Avg.	58 (0.4)	69 (0.4)	11 (0.6)
Austria	53 (2.2)	64 (2.4)	11 (3.2)
Germany	71 (2.2)	82 (1.4)	11 (2.6)
Australia	58 (1.8)	70 (1.7)	12 (2.5)
Netherlands	59 (2.4)	71 (2.9)	13 (3.7)
Romania	60 (4.1)	74 (3.6)	14 (5.5)
Belgium (Fl)	56 (2.5)	70 (1.5)	14 (2.9)
United States	66 (2.0)	81 (1.0)	15 (2.3)
Switzerland	66 (1.9)	82 (1.3)	15 (2.3)
Cyprus	51 (1.6)	67 (1.8)	16 (2.4)
Spain	57 (2.3)	73 (1.4)	16 (2.7)
Portugal	74 (2.2)	90 (1.6)	17 (2.7)
Hungary	53 (2.3)	71 (1.9)	18 (3.0)
Colombia	51 (4.7)	70 (2.2)	19 (5.2)
Singapore	29 (1.7)	54 (3.4)	25 (3.8)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 Each country was given the option of asking students if the family owned certain items. Students with at least 50% of the items on the country-specific list are presented.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

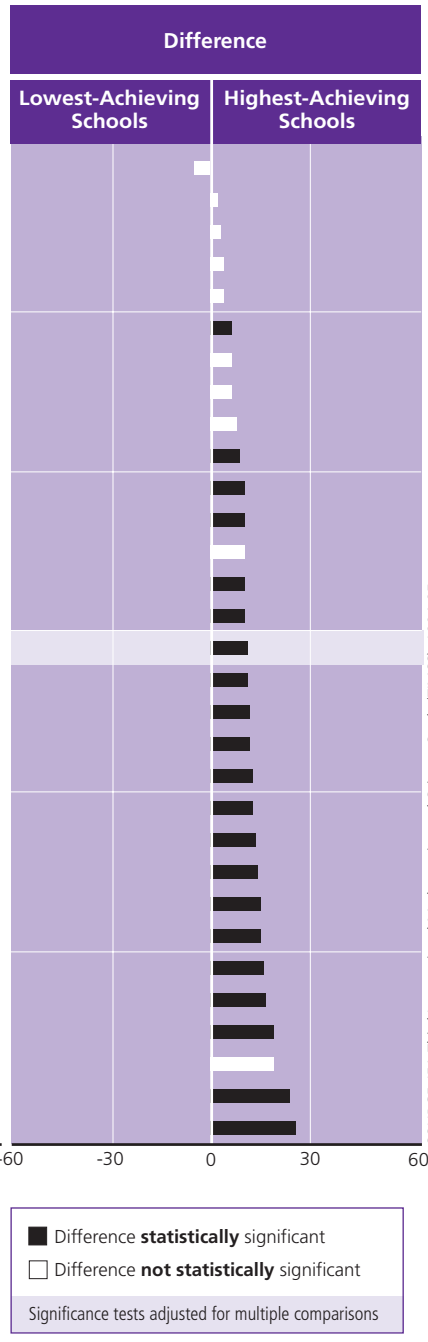
Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

France, Iran, Japan, and Scotland: Question not administered or data not available.

Exhibit 1.8 Students' Report of Possessions in the Home[1]

Schools with the Lowest and Highest Achievement – Eighth Grade* – Mathematics

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Canada	53 (1.7)	49 (1.9)	-5 (2.6)
Slovenia	77 (2.1)	79 (1.9)	2 (3.0)
Iceland	40 (3.9)	43 (3.1)	3 (5.1)
Hong Kong	48 (1.8)	53 (2.8)	4 (3.3)
Norway	60 (1.9)	64 (1.8)	4 (2.6)
Russian Federation	8 (0.9)	14 (1.3)	6 (1.7)
Czech Republic	23 (2.0)	29 (1.8)	6 (2.8)
Slovak Republic	79 (1.8)	86 (1.5)	7 (2.4)
Sweden	55 (3.0)	63 (2.0)	8 (3.5)
New Zealand	67 (1.9)	76 (1.6)	9 (2.7)
Belgium (Fr)	80 (2.5)	91 (1.5)	10 (2.9)
Germany	72 (2.4)	82 (1.4)	10 (2.7)
Lithuania	58 (2.9)	69 (2.1)	11 (3.5)
England	79 (2.3)	90 (1.5)	11 (2.8)
Ireland	82 (1.8)	93 (1.2)	11 (2.2)
International Avg.	58 (0.5)	70 (0.4)	11 (0.6)
Austria	55 (2.8)	66 (2.3)	12 (3.6)
Australia	57 (1.5)	69 (1.4)	12 (2.0)
Netherlands	59 (2.6)	71 (2.8)	12 (3.8)
Cyprus	53 (2.2)	66 (1.9)	13 (2.8)
Portugal	78 (2.1)	91 (1.5)	13 (2.8)
United States	66 (1.9)	80 (1.1)	14 (1.8)
Belgium (Fl)	54 (3.0)	69 (1.6)	15 (3.4)
Spain	58 (2.2)	73 (1.6)	15 (2.6)
Latvia (LSS)	62 (2.6)	77 (2.3)	15 (3.7)
Korea	70 (2.3)	86 (1.3)	16 (2.7)
Switzerland	66 (1.8)	82 (1.1)	17 (2.1)
Hungary	54 (2.2)	73 (2.1)	19 (3.2)
Romania	58 (4.2)	78 (3.8)	20 (6.3)
Colombia	45 (4.6)	69 (2.3)	24 (5.1)
Singapore	29 (2.1)	55 (3.0)	26 (3.7)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 Each country was given the option of asking students if the family owned certain items. Students with at least 50% of the items on the country-specific list are presented.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

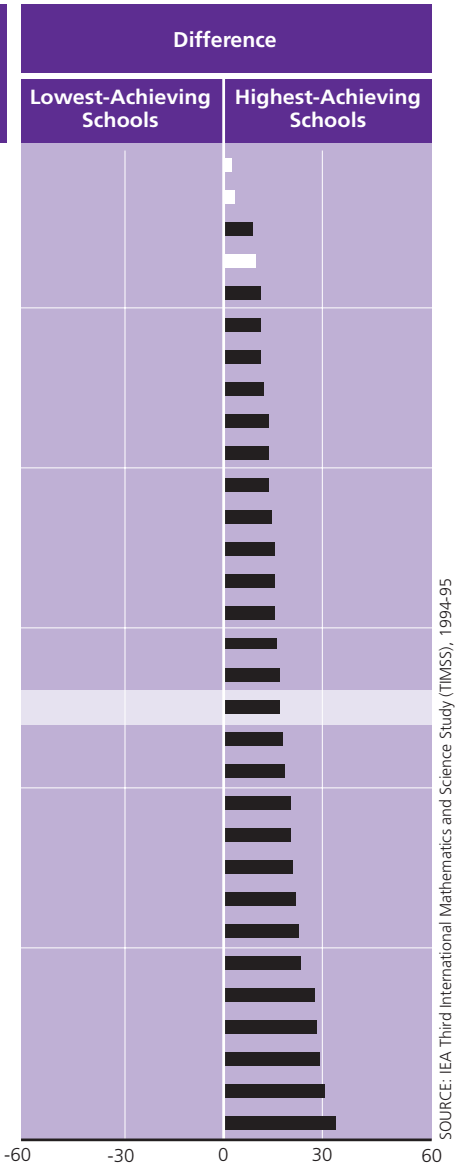
Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

France, Iran, Japan, and Scotland: Question not administered or data not available.

Exhibit 1.9

Percent of Students Having at Least One Parent Who Finished University
Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Norway	s 33 (2.4)	s 36 (3.1)	3 (3.9)
Iran, Islamic Rep.	s 3 (0.9)	r 6 (1.3)	3 (1.6)
Hong Kong	r 3 (0.6)	12 (2.6)	9 (2.7)
Iceland	r 26 (2.1)	36 (5.0)	9 (5.4)
Slovenia	15 (1.7)	26 (2.2)	11 (2.8)
Singapore	2 (0.5)	14 (2.2)	12 (2.2)
Romania	r 5 (1.3)	r 17 (3.1)	12 (3.4)
Germany	s 8 (1.8)	r 20 (1.8)	12 (2.6)
Canada	r 34 (3.0)	47 (2.9)	13 (4.2)
Netherlands	s 9 (1.7)	r 22 (3.6)	13 (4.0)
Portugal	3 (0.9)	17 (2.4)	14 (2.6)
Sweden	s 28 (2.8)	s 42 (2.5)	15 (3.7)
Switzerland	r 6 (0.9)	21 (2.2)	15 (2.4)
Czech Republic	16 (1.5)	31 (3.3)	15 (3.6)
Latvia (LSS)	s 25 (2.6)	r 40 (3.3)	16 (4.2)
Ireland	r 12 (1.6)	29 (2.7)	16 (3.1)
Colombia	r 10 (1.6)	r 26 (3.8)	17 (4.1)
International Avg.	15 (0.3)	32 (0.5)	17 (0.6)
Slovak Republic	14 (1.5)	32 (3.3)	18 (3.7)
Korea	16 (1.4)	34 (3.6)	18 (3.9)
Cyprus	s 7 (1.4)	s 27 (1.7)	20 (2.2)
Spain	r 9 (1.2)	29 (3.4)	20 (3.6)
Austria	r 5 (0.9)	26 (2.9)	21 (3.0)
United States	24 (1.5)	46 (2.3)	22 (2.7)
Lithuania	s 32 (3.3)	s 54 (3.6)	23 (4.9)
New Zealand	s 22 (1.9)	r 45 (2.7)	23 (3.3)
Russian Federation	23 (2.2)	51 (3.5)	28 (4.1)
Australia	r 18 (1.6)	47 (2.6)	29 (3.0)
Belgium (Fl)	s 13 (2.8)	r 42 (2.8)	29 (4.0)
Hungary	r 9 (1.4)	r 40 (3.7)	31 (3.9)
Belgium (Fr)	s 21 (2.2)	r 55 (2.9)	34 (3.7)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

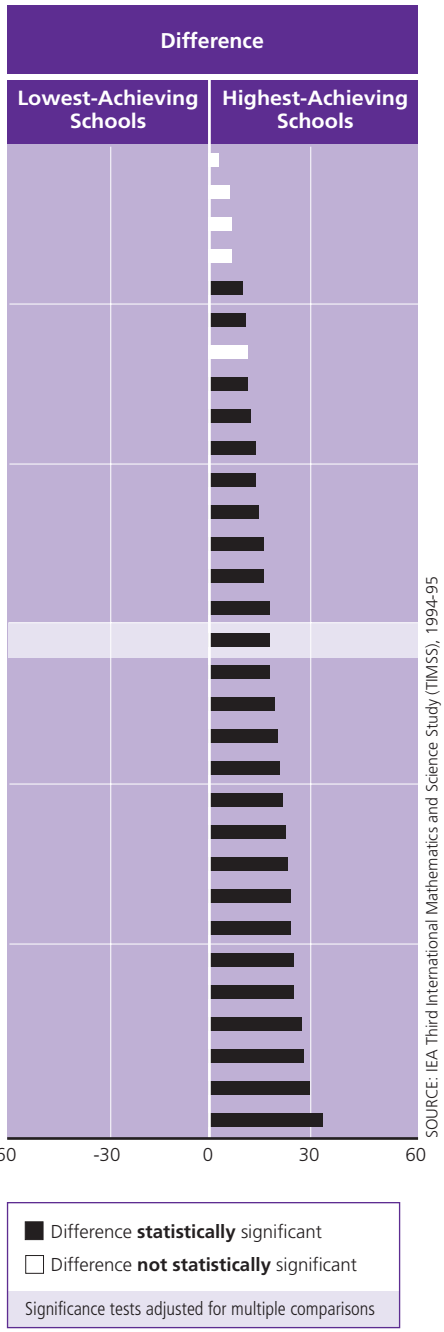
An "r" indicates response data available for 70-84% of students. An "s" indicates response data available for 50-69% of students.

England, France, Japan and Scotland: Question not administered or data not available.

Exhibit 1.10 Percent of Students Having at Least One Parent Who Finished University

Schools with the Lowest and Highest Achievement – Eighth Grade* – Mathematics

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Iran, Islamic Rep.	s 3 (0.6)	r 6 (1.3)	4 (1.5)
Norway	s 30 (2.1)	s 37 (3.3)	7 (4.0)
Iceland	r 29 (2.8)	r 36 (5.1)	7 (6.0)
Canada	r 34 (3.6)	41 (2.1)	7 (3.9)
Hong Kong	r 3 (0.6)	13 (2.5)	10 (2.7)
Romania	r 5 (1.2)	r 16 (3.0)	11 (3.1)
Netherlands	s 11 (2.3)	r 23 (3.8)	12 (4.4)
Germany	s 9 (2.1)	r 22 (1.7)	12 (2.8)
Singapore	2 (0.4)	14 (2.0)	13 (2.0)
Switzerland	r 6 (1.0)	20 (2.0)	14 (2.2)
Slovenia	13 (1.3)	28 (2.8)	14 (3.0)
Portugal	3 (0.8)	19 (2.4)	15 (2.6)
Ireland	r 11 (1.5)	28 (2.5)	17 (3.1)
Colombia	r 10 (2.1)	r 27 (3.8)	17 (4.3)
Czech Republic	13 (1.3)	31 (3.5)	18 (3.7)
International Avg.	14 (0.3)	32 (0.5)	18 (0.7)
Slovak Republic	14 (1.4)	32 (3.4)	18 (3.8)
Sweden	s 21 (2.2)	s 40 (2.6)	20 (3.1)
Spain	r 9 (1.1)	30 (3.4)	21 (3.7)
Cyprus	s 5 (1.0)	s 27 (2.0)	22 (2.2)
Austria	r 4 (0.8)	27 (2.6)	22 (2.7)
Latvia (LSS)	s 18 (2.1)	r 41 (3.0)	23 (3.7)
Korea	13 (1.2)	36 (3.3)	24 (3.5)
Lithuania	s 29 (3.1)	s 54 (3.4)	25 (4.7)
New Zealand	s 20 (1.8)	r 45 (2.7)	25 (3.5)
United States	23 (1.6)	48 (2.1)	25 (2.7)
Russian Federation	22 (2.0)	48 (4.1)	26 (5.5)
Belgium (Fl)	s 13 (2.8)	r 41 (3.3)	28 (4.4)
Australia	r 18 (1.5)	47 (2.1)	29 (2.5)
Hungary	r 9 (1.4)	r 40 (3.7)	31 (4.0)
Belgium (Fr)	s 17 (1.9)	r 52 (3.2)	34 (3.8)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

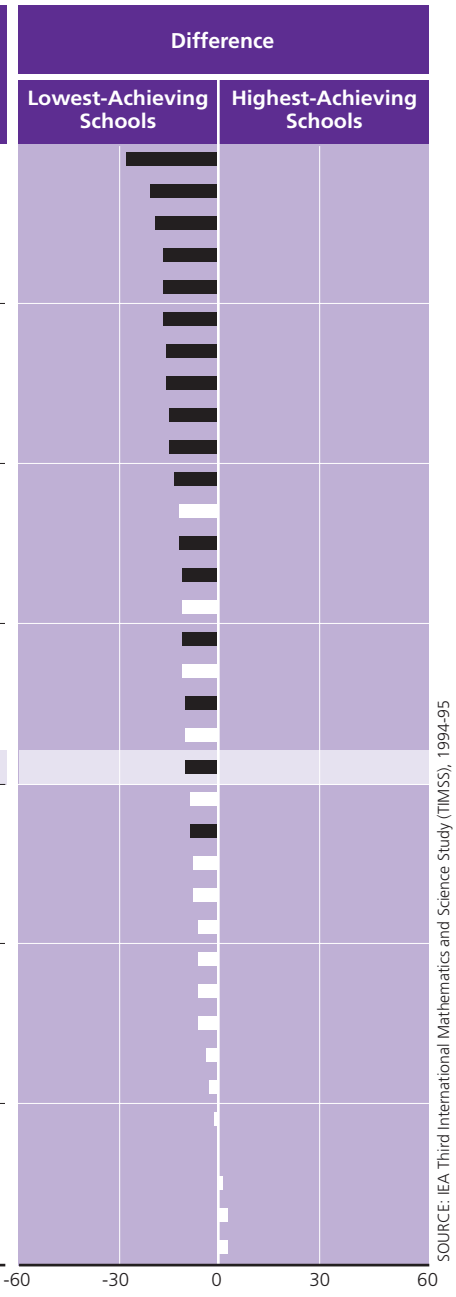
An "r" indicates response data available for 70-84% of students.

England, France, Japan and Scotland: Question not administered or data not available.

Exhibit 1.11 Percent of Students Who Work One or More Hours at Home

Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Singapore	61 (2.0)	34 (2.0)	-27 (2.9)
Belgium (Fl)	44 (2.0)	24 (1.9)	-20 (2.7)
Switzerland	42 (2.0)	23 (1.4)	-19 (2.4)
Netherlands	29 (2.8)	13 (1.8)	-16 (3.4)
Belgium (Fr)	33 (2.6)	17 (1.4)	-16 (3.0)
Cyprus	43 (1.5)	27 (1.3)	-16 (2.0)
United States	49 (1.8)	34 (1.6)	-15 (2.4)
Hungary	76 (1.7)	61 (1.9)	-15 (2.5)
Austria	29 (2.3)	15 (1.4)	-14 (2.7)
Iran, Islamic Rep.	70 (2.0)	56 (1.8)	-14 (2.7)
Ireland	34 (2.0)	21 (1.8)	-13 (2.7)
Romania	61 (3.3)	50 (3.4)	-11 (4.7)
Korea	20 (1.6)	9 (1.2)	-11 (2.0)
Germany	33 (1.9)	22 (1.4)	-11 (2.4)
Slovak Republic	59 (2.3)	49 (3.0)	-11 (3.8)
New Zealand	35 (1.9)	24 (1.7)	-10 (2.5)
Czech Republic	54 (4.4)	44 (2.6)	-10 (5.1)
Australia	34 (1.6)	25 (1.1)	-10 (2.0)
Slovenia	61 (2.6)	52 (2.4)	-9 (3.5)
International Avg.	42 (0.4)	33 (0.3)	-9 (0.5)
Spain	47 (2.1)	38 (1.9)	-8 (2.8)
Hong Kong	25 (1.6)	17 (1.6)	-8 (2.2)
England	31 (2.6)	24 (2.0)	-7 (3.3)
France	30 (1.6)	23 (1.7)	-7 (2.3)
Portugal	33 (2.1)	27 (2.0)	-6 (2.9)
Lithuania	46 (2.5)	40 (2.1)	-5 (3.2)
Latvia (LSS)	62 (2.4)	57 (2.1)	-5 (3.1)
Sweden	32 (1.8)	27 (1.9)	-5 (2.6)
Canada	38 (1.7)	36 (1.6)	-3 (2.4)
Japan	16 (1.0)	14 (0.9)	-2 (1.4)
Norway	40 (2.0)	39 (1.7)	-1 (2.6)
Russian Federation	58 (2.0)	58 (2.2)	0 (2.9)
Colombia r	70 (2.4)	72 (2.5)	1 (3.4)
Scotland	21 (2.0)	24 (1.9)	3 (2.8)
Iceland	25 (2.4)	29 (3.1)	3 (3.9)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

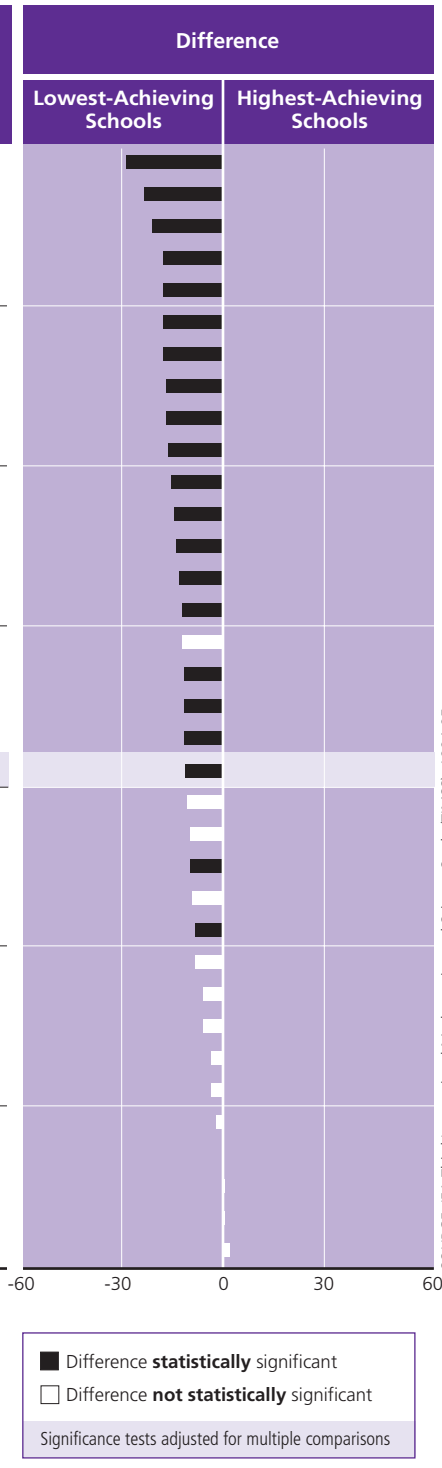
( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

An "r" indicates response data available for 70-84% of students.

Exhibit 1.12 Percent of Students Who Work One or More Hours at Home
Schools with the Lowest and Highest Achievement – Eighth Grade* – Mathematics

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Singapore	62 (2.0)	33 (1.8)	-28 (3.1)
Belgium (Fl)	47 (1.9)	24 (1.9)	-23 (2.7)
Switzerland	43 (1.9)	23 (1.3)	-20 (2.3)
Belgium (Fr)	36 (3.1)	18 (1.4)	-18 (3.4)
Netherlands	31 (2.9)	13 (1.9)	-18 (3.4)
Romania	61 (3.4)	44 (3.2)	-17 (4.9)
Iran, Islamic Rep.	71 (1.9)	54 (1.8)	-17 (2.7)
Cyprus	43 (1.8)	26 (1.2)	-16 (2.2)
Austria	31 (2.0)	15 (1.5)	-16 (2.6)
United States	50 (1.3)	34 (1.7)	-16 (2.3)
Hungary	76 (2.1)	61 (1.7)	-15 (2.9)
Ireland	34 (1.8)	20 (1.6)	-14 (2.6)
Czech Republic	57 (2.9)	44 (2.6)	-13 (3.8)
Germany	33 (2.1)	20 (1.2)	-13 (2.4)
Australia	35 (1.6)	23 (1.1)	-12 (1.8)
Slovak Republic	60 (2.3)	48 (3.1)	-12 (3.9)
Latvia (LSS)	67 (2.5)	55 (2.0)	-11 (3.3)
New Zealand	36 (2.1)	25 (1.5)	-11 (2.6)
Sweden	34 (1.9)	24 (1.3)	-11 (2.2)
International Avg.	44 (0.4)	33 (0.3)	-11 (0.5)
Slovenia	62 (2.6)	52 (2.5)	-10 (3.3)
Lithuania	50 (2.6)	40 (1.8)	-10 (3.3)
Korea	19 (1.7)	10 (1.0)	-9 (1.9)
Portugal	34 (1.7)	26 (1.9)	-8 (2.6)
Hong Kong	25 (1.6)	16 (1.2)	-8 (2.1)
Spain	48 (2.0)	40 (1.7)	-8 (2.6)
England	31 (2.5)	25 (2.1)	-6 (3.3)
France	29 (1.8)	23 (1.6)	-5 (2.4)
Iceland	30 (3.1)	27 (3.1)	-3 (4.4)
Japan	17 (1.1)	14 (0.8)	-3 (1.4)
Canada	38 (2.1)	36 (1.6)	-1 (2.6)
Scotland	23 (2.1)	24 (2.1)	0 (3.1)
Colombia r	72 (2.4)	73 (2.1)	0 (3.1)
Russian Federation	60 (2.2)	61 (2.6)	1 (3.0)
Norway	38 (2.1)	41 (1.3)	2 (2.3)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

An "r" indicates response data available for 70-84% of students.

Home-School Interface

Whereas indicators of resources in the home such as those presented in the previous section clearly belong in the home-background category, there are other, often affective, variables that are jointly influenced by both home and school factors. The home-school interface category represents this area of interaction between the home and school. This category includes:

- maternal press for academic success
- student press for academic success
- student aspirations for university education
- homework frequency

Maternal Press for Academic Success
Parents serve as the primary educators of their children. They guide and mold a student's attitudes and work practices, and they inculcate values about school and learning. To probe the influence of maternal press for academic achievement, TIMSS asked eighth-grade students how important their mother thought it was for them to do well in science, mathematics, and language. The percentages of students in the high- and low-performing schools who reported that their mother thought it was important to do well in all three areas are shown in Exhibits 1.13 and 1.14.

Students' reports of maternal press were consistently high in both high- and low-achieving schools, indicating that, almost universally, students thought their mothers wanted them to do well at school. In many countries, more than 90% of students reported this in both groups of schools. Because of the generally high perception of maternal press among students, there was not much scope for differences between the two school types. The countries with the greatest reported difference in both mathematics and science included France, Hong Kong, Hungary, and Ireland. Irish students (16% for science and 14% for mathematics) reported the largest differences.

Student Press for Academic Success
Although maternal press may well be influential in the initial formation of student attitudes, students' own predilections and their experiences in school play a major role also. As students grow older, their own internal press for achievement more and more determines the academic effort they invest and the choices they make. In addition to maternal academic press, therefore, students were asked how important they themselves thought it was to do well in science, mathematics, and language. Exhibits 1.15 and 1.16 present the percentages of students in high- and low-achieving schools in each country that thought it was important to do well in all three areas.

As with maternal academic press, students' reported level of academic press were generally high in both groups of schools, and for most countries the differences between them were not statistically significant. Only in Hong Kong, Ireland, and Singapore were the differences between high- and low-achieving schools significant for both science and mathematics. Although there was a few countries where maternal and student academic press were fairly effective in discriminating between high- and low-achieving schools, in general the level of academic press reported was so high as to leave little scope for differences between schools. Within the home-school interface category, therefore, differences between the top and bottom one-third of schools are better explained by students' aspirations and homework practices than by academic press (see next sections).

Students' University Aspirations

Just as students' attitudes to school are likely to be shaped by a combination of their experience in school and in the home, students' aspirations for further education also are likely to be influenced by both home and school factors. Research shows that effective schools are characterized by high academic expectations for students,[4] and the data in Exhibits 1.17 and 1.18 seem to support this finding. These exhibits show that in most countries, the majority of eighth-grade students in the low-achieving schools do not intend to go to university, while many more in the high-achieving schools have university plans. On average across countries, more than half of the students in high-achieving schools reported that they are planning to attend university, compared with less than one third in low-achieving schools. This difference is even more pronounced in countries such as Belgium (Flemish and French), Ireland, and Singapore, where the percentage in the high-achieving schools was more than twice that in the low-achieving schools. Countries with little or no difference between the two groups of schools in terms of university aspirations included Canada, Colombia, Iceland, Iran, and Norway.

It is likely that students' aspirations for university education are more directly influenced by tracking and streaming than any other variables presented in this report, and yet it is noticeable that in several of the countries where tracking is well established, including Austria, Germany, the Netherlands, and Switzerland, the percentage of students in the high-achieving schools planning to attend university is relatively low. This may reflect the existence of a more differentiated tertiary education system in these countries, and in particular a well-developed system of technical and vocational institutions that attracts a proportion of the more able students.

Students' Homework Practices

The role of homework at the eighth grade varies considerably from country to country. In more than half of the TIMSS countries, very high percentages of students in both high- and low-achieving schools reported doing daily homework in science, mathematics, and other

[4] Purkey, S.C., and Smith, M.S. (1982). "Too Soon to Cheer? Synthesis of Research on Effective Schools," *Educational Leadership*, Dec., 64-69.

subjects, and there was little or no difference between the two school types. In Singapore, for example, where average student performance on the TIMSS eighth-grade mathematics and science tests was among the highest, 87% of students in the low-achieving schools reported completing homework daily in all three areas. This percentage was greater than that reported by students in high-achieving schools in many of the other TIMSS countries. By way of contrast, the percentages of students in Japan, also a country with high average student achievement, that reported doing homework in the three subjects was lower than in most countries. Consequently, while doing homework in a range of subjects may be important, the type, efficiency and amount of homework may also be important. Japanese parents frequently provide a specific study area, even when space is limited in the family home, so that the child may complete homework with minimal distractions.[5]

In about one third of the countries, the percentage of students that reported doing daily homework was significantly less in the low-achieving schools (see Exhibits 1.19 and 1.20). In these countries, homework is more characteristic of the high-achieving schools. Countries with the greatest differences in both mathematics and science included Australia, Ireland, Hong Kong, and United States. In these countries, the difference was at least 20 percentage points in each subject.

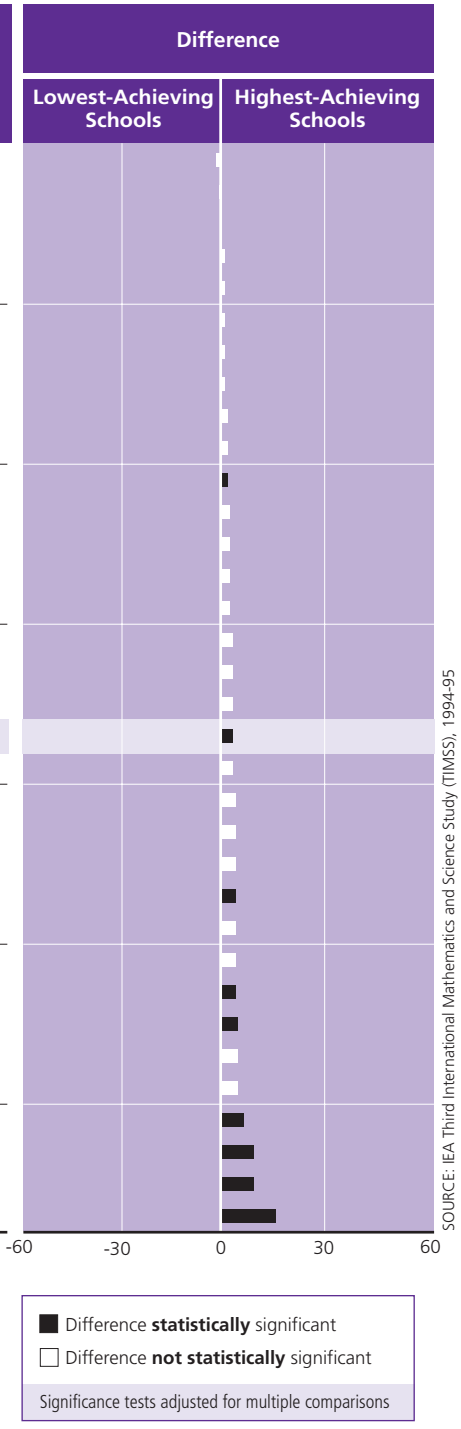
[5] Stevenson, H. W., and Stigler, J. W. (1992). *The Learning Gap: Why Our Schools Are Failing and What We Can Learn from Japanese and Chinese Education*, New York: Summit Books.

Exhibit 1.13 - 1.20 Overleaf

Exhibit 1.13 Percent of Students Believing That Their Mother Thinks It Is Important to Do Well in Science, Mathematics, and Language

Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Switzerland	68 (2.1)	66 (1.7)	-1 (2.7)
Lithuania	75 (1.8)	74 (1.6)	-1 (2.4)
Austria	77 (1.5)	77 (2.2)	0 (2.7)
Iran, Islamic Rep.	91 (1.4)	91 (0.9)	0 (1.6)
Russian Federation	91 (0.9)	92 (1.1)	1 (1.4)
Latvia (LSS)	82 (2.3)	83 (1.5)	1 (2.8)
Spain	98 (0.5)	99 (0.3)	1 (0.6)
Romania	85 (2.9)	86 (2.7)	1 (4.0)
Slovenia	78 (1.2)	79 (1.5)	2 (2.0)
Colombia	97 (1.1)	99 (0.4)	2 (1.1)
Singapore	98 (0.5)	99 (0.2)	2 (0.5)
England	94 (0.8)	96 (0.9)	2 (1.2)
Belgium (Fl)	90 (1.8)	93 (0.8)	2 (1.9)
Belgium (Fr)	96 (1.0)	98 (0.4)	2 (1.1)
Sweden	89 (1.0)	92 (0.9)	2 (1.3)
Canada	95 (0.9)	98 (0.3)	3 (1.0)
Germany	67 (2.2)	70 (2.5)	3 (3.4)
Portugal	92 (1.0)	95 (0.8)	3 (1.3)
International Avg.	87 (0.3)	90 (0.2)	3 (0.3)
Slovak Republic	91 (0.9)	94 (0.7)	4 (1.2)
Korea	87 (1.1)	91 (0.9)	4 (1.4)
Scotland	90 (1.3)	94 (0.9)	4 (1.6)
Norway	91 (1.3)	95 (0.7)	4 (1.5)
Australia	91 (0.9)	95 (0.6)	4 (1.1)
Cyprus	84 (1.4)	88 (1.1)	4 (1.8)
Netherlands	89 (1.3)	93 (1.0)	4 (1.6)
New Zealand	91 (1.0)	95 (0.6)	4 (1.2)
United States	93 (0.6)	97 (0.4)	4 (0.7)
Iceland	90 (3.8)	95 (0.8)	5 (3.9)
Czech Republic	88 (2.1)	94 (1.1)	5 (2.3)
Hungary	79 (1.4)	85 (1.2)	6 (1.8)
Hong Kong	79 (1.3)	89 (1.4)	9 (2.0)
France	82 (1.7)	92 (1.0)	10 (2.0)
Ireland	79 (2.3)	95 (0.8)	16 (2.4)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

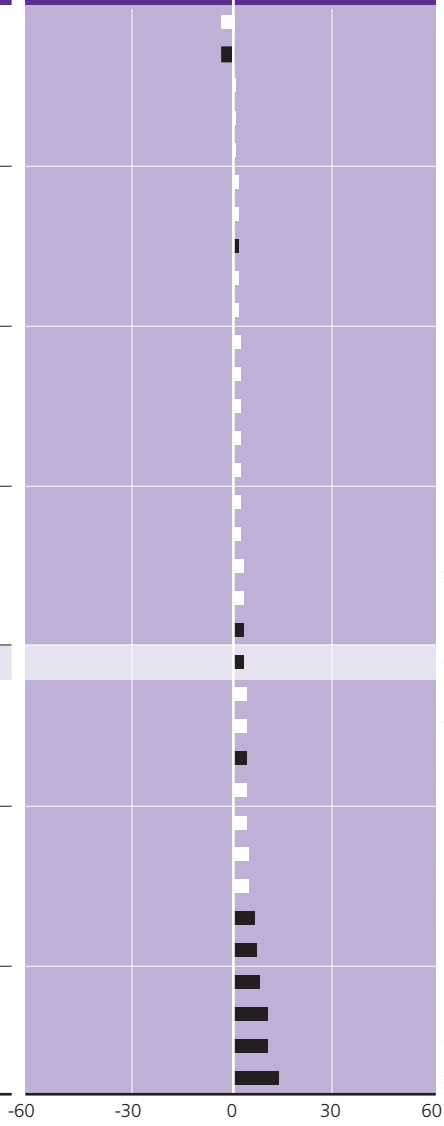
Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

Japan: Question not administered or data not available.

Exhibit 1.14 Percent of Students Believing That Their Mother Thinks It Is Important to Do Well in Science, Mathematics, and Language

Schools with the Lowest and Highest Achievement – Eighth Grade* – Mathematics

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Switzerland	69 (1.6)	65 (1.8)	-4 (2.4)
Austria	78 (1.7)	75 (2.1)	-3 (2.7)
Lithuania	74 (2.1)	75 (1.8)	1 (2.8)
Spain	98 (0.5)	99 (0.2)	1 (0.5)
Romania	85 (3.0)	87 (2.6)	1 (4.5)
Latvia (LSS)	82 (2.2)	84 (1.6)	2 (2.7)
Canada	96 (0.8)	98 (0.3)	2 (0.9)
Singapore	98 (0.5)	99 (0.2)	2 (0.5)
Iran, Islamic Rep.	90 (1.6)	92 (0.9)	2 (1.7)
Belgium (Fl)	90 (1.8)	92 (0.6)	2 (1.8)
Colombia	96 (1.1)	99 (0.3)	2 (1.2)
Slovenia	78 (1.1)	80 (1.5)	2 (1.8)
Russian Federation	90 (1.2)	92 (1.1)	3 (1.8)
Norway	92 (1.2)	95 (0.6)	3 (1.3)
Belgium (Fr)	95 (1.1)	98 (0.4)	3 (1.2)
Slovak Republic	92 (0.8)	95 (0.6)	3 (1.1)
England	94 (1.0)	97 (0.7)	3 (1.4)
Czech Republic	91 (1.6)	94 (1.2)	3 (2.0)
Korea	88 (1.1)	92 (0.9)	4 (1.4)
New Zealand	92 (1.0)	95 (0.4)	4 (1.1)
International Avg.	87 (0.3)	91 (0.2)	4 (0.4)
Netherlands	89 (1.3)	93 (1.2)	4 (1.8)
Germany	65 (2.5)	69 (2.6)	4 (3.6)
Portugal	91 (0.9)	95 (0.8)	4 (1.2)
Sweden	87 (1.1)	92 (1.0)	5 (1.5)
Cyprus	84 (1.7)	89 (1.1)	5 (2.1)
Scotland	90 (1.2)	94 (0.8)	5 (1.5)
Iceland	90 (4.4)	95 (0.8)	5 (4.5)
United States	92 (0.5)	98 (0.3)	6 (0.6)
Australia	88 (0.9)	96 (0.5)	8 (0.9)
Hungary	79 (1.7)	87 (1.2)	8 (2.1)
France	81 (1.8)	92 (1.0)	11 (2.1)
Hong Kong	78 (1.5)	89 (1.1)	11 (2.0)
Ireland	81 (2.3)	95 (1.0)	14 (2.4)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

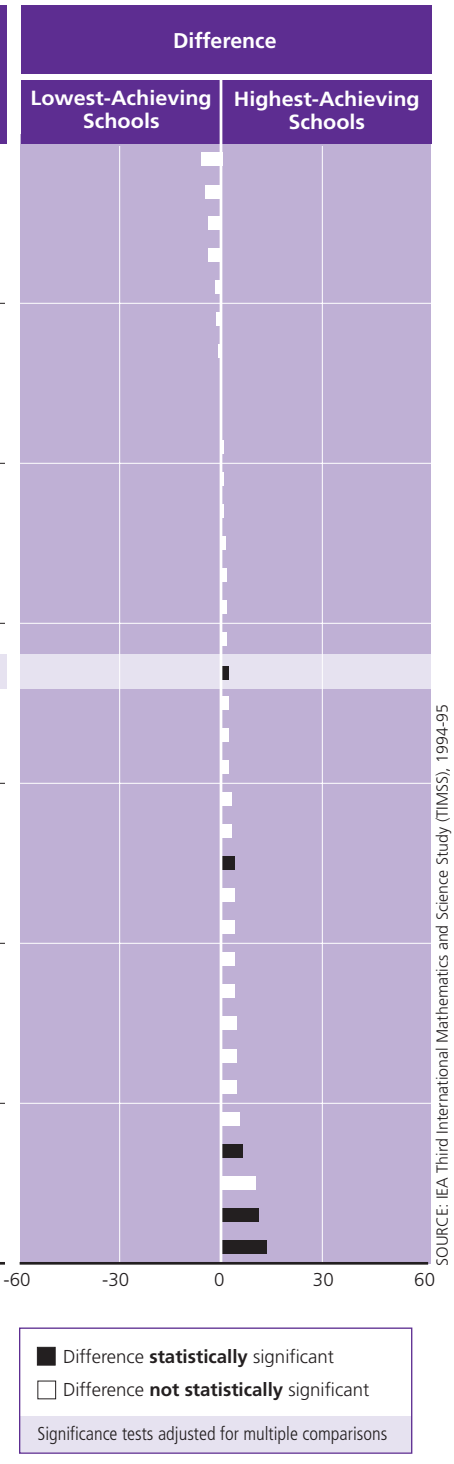
Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

Japan: Question not administered or data not available

Exhibit 1.15 Percent of Students Believing That It Is Important to Do Well in Science, Mathematics, and Language

Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Germany	71 (2.1)	65 (2.1)	-6 (3.0)
Austria	77 (2.4)	73 (2.4)	-4 (3.4)
Switzerland	67 (1.9)	63 (2.0)	-4 (2.7)
Slovenia	86 (1.5)	83 (1.6)	-4 (2.2)
Latvia (LSS)	81 (2.0)	80 (1.7)	-2 (2.6)
Iran, Islamic Rep.	95 (0.6)	94 (1.0)	-1 (1.2)
United States	94 (0.6)	94 (1.2)	-1 (1.3)
Spain	98 (0.5)	98 (0.5)	0 (0.7)
Slovak Republic	83 (1.3)	83 (1.6)	0 (2.0)
Belgium (Fl)	92 (1.2)	92 (1.1)	0 (1.6)
England	95 (1.1)	96 (1.0)	1 (1.5)
Japan	83 (1.1)	84 (1.1)	1 (1.6)
Portugal	94 (0.8)	96 (0.7)	1 (1.1)
Colombia	98 (0.6)	99 (0.2)	1 (0.6)
Lithuania	75 (1.9)	77 (1.7)	2 (2.6)
Russian Federation	90 (1.0)	91 (1.1)	2 (1.5)
International Avg.	86 (0.3)	88 (0.2)	2 (0.4)
New Zealand	88 (1.2)	90 (1.0)	2 (1.5)
Netherlands	92 (1.2)	94 (1.2)	2 (1.6)
Sweden	80 (1.4)	83 (1.4)	3 (2.0)
Hungary	81 (1.5)	84 (1.2)	3 (1.9)
Korea	86 (1.2)	89 (1.2)	3 (1.7)
Singapore	96 (0.7)	99 (0.2)	4 (0.7)
Belgium (Fr)	92 (1.1)	95 (1.0)	4 (1.5)
Romania	75 (4.4)	79 (3.7)	4 (5.7)
Norway	88 (1.4)	92 (1.2)	4 (1.9)
Canada	90 (2.6)	94 (0.6)	4 (2.6)
Cyprus	83 (2.4)	87 (1.4)	4 (2.8)
Czech Republic	84 (2.1)	88 (1.2)	4 (2.4)
Iceland	86 (4.1)	91 (1.3)	5 (4.3)
Australia	85 (1.5)	90 (0.9)	5 (1.8)
Scotland	88 (1.7)	94 (0.9)	6 (1.9)
France	75 (2.8)	85 (1.6)	10 (3.2)
Hong Kong	83 (1.8)	94 (1.2)	11 (2.2)
Ireland	77 (2.4)	91 (1.0)	13 (2.6)



* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

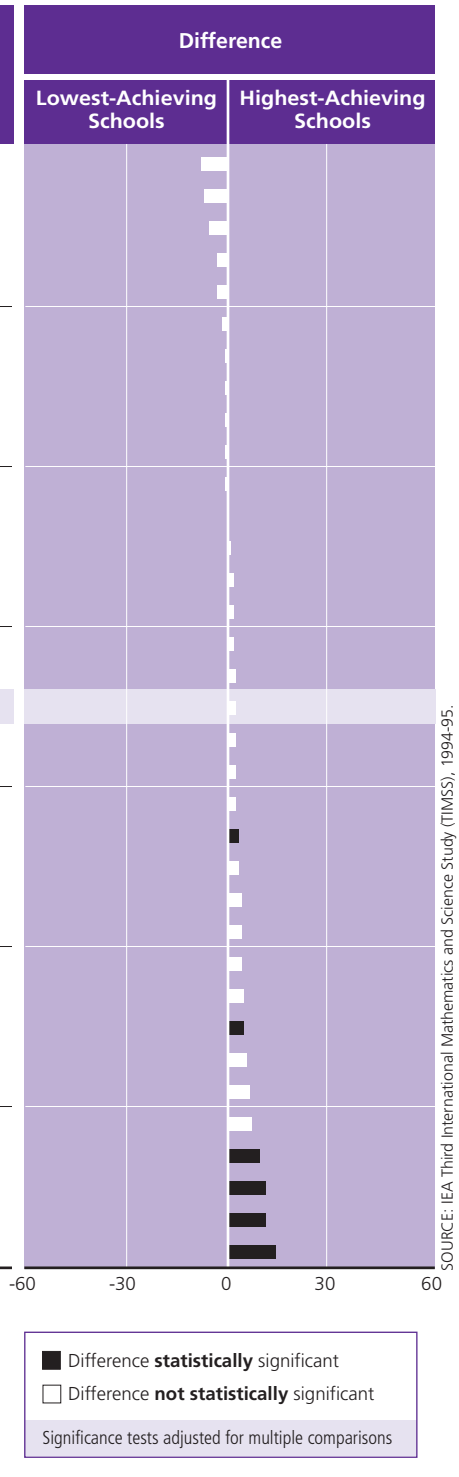
( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

Exhibit 1.16 Percent of Students Believing That It Is Important to Do Well in Science, Mathematics, and Language

Schools with the Lowest and Highest Achievement – Eighth Grade* – Mathematics

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Austria	79 (1.9)	71 (2.5)	-8 (3.1)
Switzerland	68 (1.5)	61 (2.1)	-7 (2.5)
Germany	70 (2.0)	65 (2.1)	-5 (3.0)
Latvia (LSS)	82 (2.0)	79 (1.6)	-3 (2.6)
Slovenia	85 (1.8)	82 (1.4)	-2 (2.4)
Iran, Islamic Rep.	95 (0.7)	94 (1.0)	-1 (1.3)
Spain	98 (0.5)	97 (0.6)	-1 (0.8)
Lithuania	77 (2.0)	76 (2.1)	-1 (3.0)
Japan	84 (1.2)	84 (1.2)	0 (1.8)
England	96 (0.9)	96 (0.9)	0 (1.3)
Slovak Republic	84 (1.3)	84 (1.6)	0 (2.0)
Canada	92 (2.0)	93 (0.6)	1 (2.2)
Belgium (Fl)	92 (1.1)	93 (0.8)	1 (1.4)
New Zealand	89 (1.3)	91 (0.9)	2 (1.5)
United States	93 (0.7)	95 (1.1)	2 (1.4)
Portugal	94 (0.9)	96 (0.6)	2 (1.1)
Colombia	97 (0.6)	100 (0.2)	2 (0.6)
International Avg.	85 (0.3)	88 (0.2)	3 (0.4)
Czech Republic	86 (1.6)	88 (1.2)	3 (2.0)
Korea	87 (1.1)	90 (1.2)	3 (1.6)
Netherlands	92 (1.2)	95 (1.2)	3 (1.7)
Singapore	96 (0.7)	99 (0.2)	3 (0.7)
Hungary	81 (1.5)	85 (1.3)	3 (1.8)
Russian Federation	88 (1.2)	92 (1.3)	4 (1.8)
Romania	76 (4.5)	80 (3.6)	4 (6.4)
Cyprus	83 (2.4)	87 (1.4)	5 (2.8)
Belgium (Fr)	90 (1.4)	95 (1.0)	5 (1.7)
Norway	89 (1.1)	94 (1.0)	5 (1.5)
Scotland	88 (1.8)	94 (0.8)	6 (1.9)
Iceland	84 (3.4)	91 (1.4)	6 (3.7)
Sweden	77 (1.8)	84 (1.4)	7 (2.3)
Australia	81 (1.5)	91 (0.7)	10 (1.6)
Hong Kong	83 (1.6)	94 (1.1)	11 (2.0)
Ireland	78 (2.6)	90 (1.2)	12 (2.8)
France	73 (2.9)	87 (1.3)	15 (3.2)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

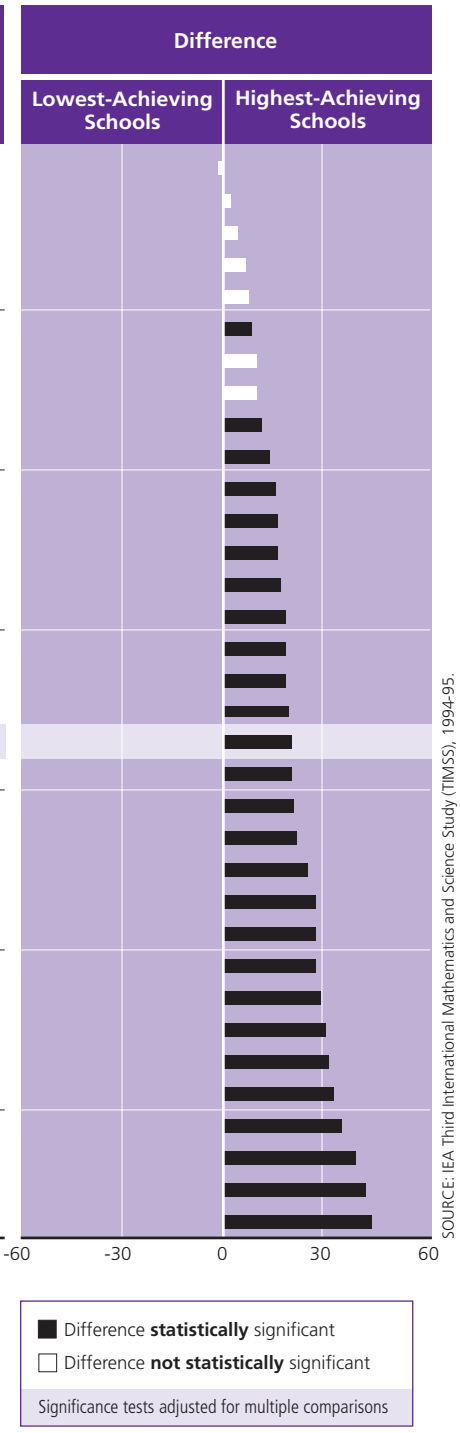
( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

Exhibit 1.17 Percent of Students Planning to Attend University

Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Iran, Islamic Rep.	r 40 (3.5)	39 (3.1)	-1 (4.7)
Norway	33 (2.1)	36 (2.3)	3 (3.1)
Iceland	38 (2.1)	44 (2.3)	6 (3.1)
Canada	66 (2.8)	74 (1.8)	7 (3.3)
Korea	58 (1.9)	65 (1.8)	8 (2.6)
Sweden	26 (1.6)	35 (2.1)	9 (2.6)
Latvia (LSS)	s 21 (2.5)	r 32 (2.9)	11 (3.8)
Colombia	37 (9.9)	48 (4.0)	11 (10.7)
Japan	51 (1.5)	63 (1.8)	12 (2.4)
Germany	r 3 (0.9)	18 (1.8)	15 (2.0)
Switzerland	r 3 (0.5)	19 (2.3)	16 (2.4)
United States	54 (2.0)	71 (1.6)	17 (2.5)
Slovenia	31 (2.2)	48 (2.5)	17 (3.3)
Spain	45 (1.5)	63 (2.2)	18 (2.7)
Portugal	r 37 (2.0)	56 (2.4)	19 (3.1)
Slovak Republic	36 (1.8)	55 (3.0)	19 (3.5)
Romania	r 16 (2.4)	r 35 (3.4)	20 (4.2)
Cyprus	s 24 (2.3)	r 44 (2.7)	20 (3.5)
International Avg.	30 (0.5)	51 (0.5)	21 (0.7)
Scotland	r 22 (1.7)	44 (2.2)	21 (2.8)
Lithuania	s 21 (2.2)	r 43 (3.1)	22 (3.8)
Russian Federation	41 (3.0)	64 (3.9)	23 (4.9)
Australia	38 (2.8)	64 (2.2)	26 (3.6)
Netherlands	r 6 (1.4)	34 (4.0)	28 (4.2)
Czech Republic	19 (2.5)	47 (4.1)	29 (4.8)
New Zealand	31 (1.9)	60 (2.0)	29 (2.7)
France	r 30 (2.4)	61 (2.3)	30 (3.3)
Austria	9 (1.2)	41 (3.5)	32 (3.7)
Hong Kong	r 39 (3.2)	71 (2.0)	33 (3.7)
Hungary	s 20 (2.4)	r 54 (3.2)	34 (4.0)
Ireland	25 (3.0)	61 (2.4)	37 (3.8)
Belgium (Fr)	40 (2.7)	80 (2.1)	40 (3.4)
Singapore	22 (1.5)	65 (2.9)	43 (3.3)
Belgium (Fl)	r 14 (2.9)	60 (2.6)	45 (3.9)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

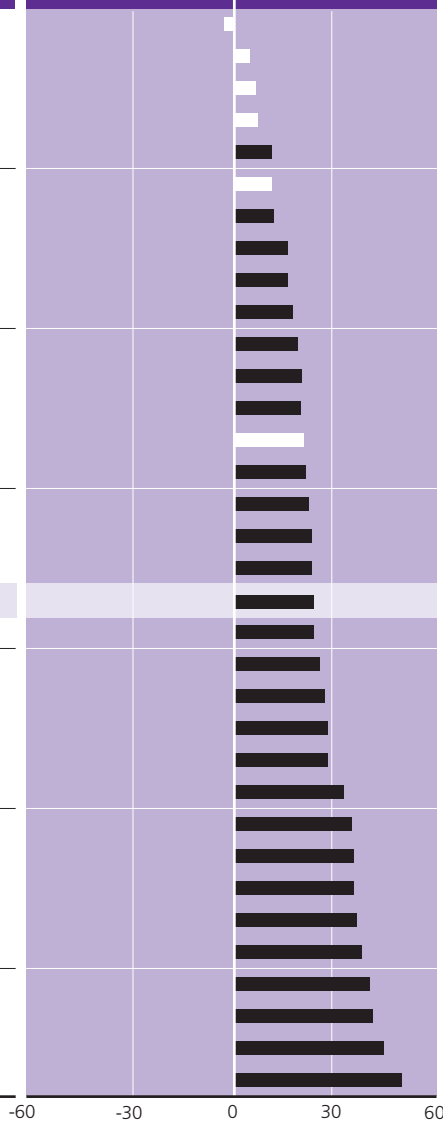
Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

An "r" indicates response data available for 70-84% of students. An "s" indicates response data available for 50-69% of students.

England: Question not administered or data not available.

Exhibit 1.18 Percent of Students Planning to Attend University
Schools with the Lowest and Highest Achievement – Eighth Grade* – Mathematics

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Iran, Islamic Rep.	r 45 (3.2)	42 (2.9)	-3 (4.4)
Canada	66 (2.3)	71 (1.7)	5 (2.6)
Iceland	38 (2.2)	44 (2.8)	6 (3.6)
Norway	32 (1.9)	39 (2.5)	7 (3.1)
Korea	57 (1.8)	68 (1.7)	11 (2.5)
Colombia	37 (10.2)	48 (4.1)	11 (10.9)
Japan	51 (2.1)	64 (1.7)	12 (2.8)
Germany	r 4 (1.1)	20 (1.9)	16 (2.2)
Switzerland	r 3 (0.4)	r 19 (2.6)	16 (2.7)
Latvia (LSS)	s 15 (1.9)	r 33 (2.8)	18 (3.6)
Sweden	18 (1.5)	37 (2.0)	19 (2.1)
Spain	45 (1.7)	65 (2.2)	20 (2.9)
Slovenia	31 (2.1)	51 (2.5)	20 (3.3)
Russian Federation	39 (2.4)	59 (6.6)	21 (6.9)
Scotland	r 23 (2.1)	45 (2.1)	22 (2.9)
Cyprus	s 24 (3.2)	r 46 (2.5)	23 (4.2)
United States	51 (2.0)	75 (1.8)	23 (2.8)
Lithuania	s 20 (2.4)	r 44 (3.2)	24 (4.0)
International Avg.	28 (0.5)	53 (0.5)	24 (0.7)
Romania	r 11 (2.1)	36 (3.4)	25 (3.9)
Slovak Republic	33 (1.7)	59 (2.9)	26 (3.4)
Netherlands	r 6 (1.4)	34 (4.4)	27 (4.6)
Portugal	r 33 (2.2)	61 (2.6)	28 (3.6)
New Zealand	32 (1.9)	60 (2.0)	28 (2.8)
France	r 30 (2.4)	63 (2.6)	33 (3.7)
Hong Kong	r 37 (3.2)	72 (1.8)	36 (3.9)
Austria	8 (1.2)	44 (2.6)	36 (2.8)
Czech Republic	14 (2.2)	51 (3.6)	37 (4.1)
Hungary	s 20 (2.6)	r 57 (3.3)	37 (4.0)
Ireland	24 (3.0)	62 (2.5)	39 (3.8)
Australia	26 (1.4)	67 (1.7)	41 (2.1)
Singapore	23 (1.5)	64 (2.9)	42 (3.5)
Belgium (Fr)	34 (3.9)	79 (2.2)	45 (4.8)
Belgium (Fl)	r 10 (2.1)	61 (2.5)	50 (3.3)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

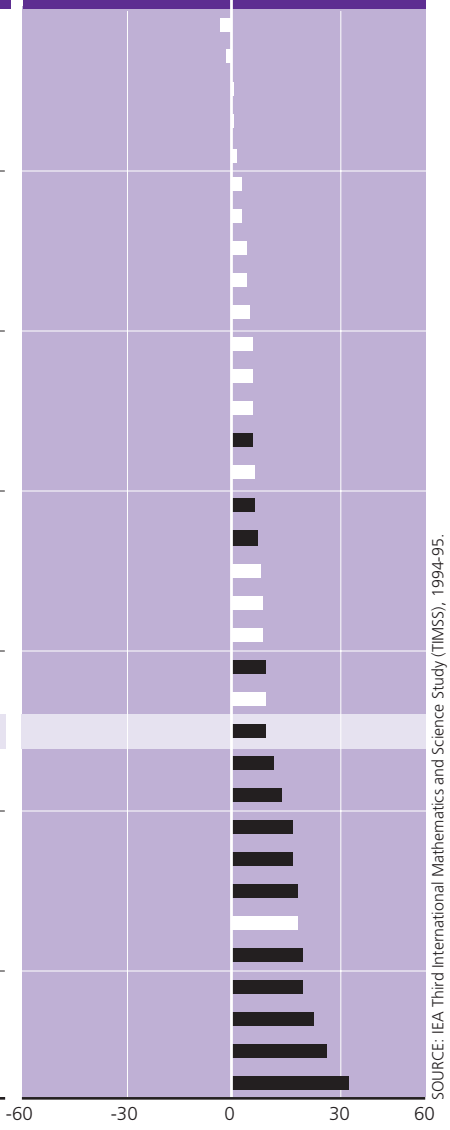
An "r" indicates response data available for 70-84% of students. An "s" indicates response data available for 50-69% of students.

England: Question not administered or data not available.

Exhibit 1.19 Percent of Students Daily Doing Homework in Science, Mathematics, and Other Subjects

Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Slovenia	87 (1.5)	85 (1.5)	-3 (2.2)
Belgium (Fl)	89 (1.5)	88 (1.9)	-1 (2.4)
Korea	64 (2.2)	65 (2.6)	0 (3.4)
Iran, Islamic Rep.	r 95 (0.8)	95 (1.1)	0 (1.4)
Latvia (LSS)	79 (2.4)	79 (2.2)	1 (3.2)
Slovak Republic	81 (1.8)	84 (1.5)	3 (2.4)
Lithuania	80 (2.2)	83 (1.6)	3 (2.7)
Switzerland	86 (1.5)	90 (1.2)	4 (1.9)
Sweden	79 (1.7)	84 (1.3)	5 (2.1)
Spain	89 (1.3)	94 (0.9)	5 (1.6)
Cyprus	72 (1.4)	77 (1.5)	6 (2.1)
Norway	83 (1.8)	89 (1.3)	6 (2.3)
Colombia	r 86 (2.0)	92 (1.4)	6 (2.4)
Portugal	86 (1.5)	92 (0.9)	6 (1.8)
Austria	67 (2.5)	74 (3.4)	7 (4.2)
Russian Federation	81 (1.4)	89 (1.5)	7 (2.0)
Singapore	87 (1.2)	95 (0.5)	8 (1.4)
Netherlands	86 (2.5)	94 (1.0)	8 (2.7)
Canada	66 (5.6)	74 (1.6)	9 (5.8)
Czech Republic	66 (2.8)	75 (2.5)	9 (3.7)
Hungary	83 (1.7)	93 (0.9)	9 (2.0)
Japan	68 (2.3)	77 (2.0)	10 (3.1)
International Avg.	75 (0.4)	85 (0.3)	10 (0.5)
Romania	70 (2.7)	82 (2.4)	12 (3.6)
Belgium (Fr)	80 (2.0)	94 (0.9)	14 (2.2)
Germany	67 (2.4)	85 (1.4)	18 (2.8)
France	69 (2.0)	87 (1.4)	18 (2.4)
New Zealand	66 (2.3)	85 (1.6)	18 (2.8)
Iceland	69 (5.8)	87 (2.2)	19 (6.2)
United States	59 (2.7)	79 (1.8)	20 (3.2)
Scotland	56 (2.9)	76 (2.4)	20 (3.7)
Hong Kong	58 (3.0)	81 (2.0)	23 (3.6)
Australia	58 (2.9)	85 (1.3)	27 (3.1)
Ireland	57 (3.5)	90 (1.4)	33 (3.8)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

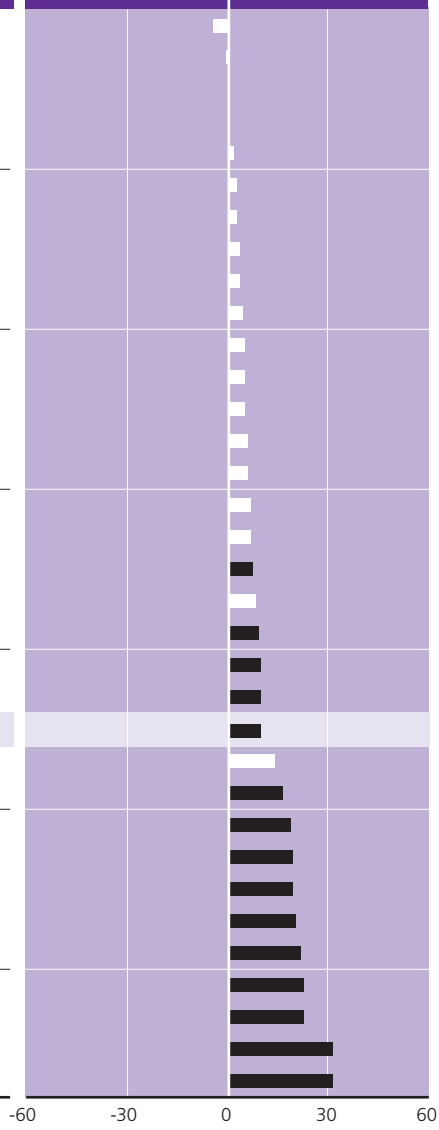
An "r" indicates response data available for 70-84% of students.

England: Question not administered or data not available.

Exhibit 1.20 Percent of Students Daily Doing Homework in Science, Mathematics, and Other Subjects

Schools with the Lowest and Highest Achievement – Eighth Grade* – Mathematics

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Slovenia	88 (1.6)	84 (1.5)	-4 (2.0)
Belgium (Fl)	88 (1.3)	88 (1.8)	0 (2.2)
Slovak Republic	82 (1.8)	83 (1.9)	0 (2.6)
Latvia (LSS)	80 (2.5)	80 (2.3)	0 (3.4)
Switzerland	85 (1.4)	87 (1.3)	2 (2.0)
Korea	64 (2.7)	67 (1.6)	2 (3.0)
Iran, Islamic Rep.	r 94 (0.7)	97 (0.7)	3 (1.0)
Spain	90 (1.3)	94 (0.9)	4 (1.5)
Colombia	r 89 (1.9)	93 (1.2)	4 (2.5)
Lithuania	80 (2.5)	84 (1.6)	4 (3.0)
Austria	66 (2.3)	71 (2.9)	5 (3.7)
Cyprus	73 (1.7)	78 (1.5)	5 (2.3)
Czech Republic	67 (2.1)	73 (3.6)	6 (4.2)
Portugal	86 (1.6)	92 (1.0)	6 (1.9)
Norway	83 (1.6)	89 (1.3)	6 (2.1)
Canada	66 (3.9)	73 (2.1)	6 (4.6)
Netherlands	86 (2.6)	93 (1.2)	7 (2.8)
Singapore	87 (1.4)	95 (0.6)	8 (1.5)
Japan	69 (2.3)	78 (2.0)	9 (3.4)
Sweden	76 (2.0)	85 (1.5)	9 (2.2)
Hungary	82 (1.9)	92 (1.0)	10 (2.1)
Russian Federation	79 (1.1)	89 (1.0)	10 (1.3)
International Avg.	74 (0.4)	85 (0.3)	10 (0.5)
Romania	69 (2.9)	82 (3.1)	14 (4.7)
Scotland	60 (3.1)	75 (2.5)	16 (4.0)
France	67 (1.9)	86 (1.4)	19 (2.3)
New Zealand	65 (2.4)	85 (1.6)	20 (3.0)
Belgium (Fr)	75 (2.8)	95 (0.7)	20 (2.9)
Germany	64 (2.5)	85 (1.3)	20 (2.8)
United States	57 (2.3)	79 (2.0)	22 (3.8)
Iceland	65 (5.0)	87 (2.2)	23 (5.3)
Hong Kong	57 (3.2)	80 (2.6)	23 (4.2)
Ireland	59 (3.7)	90 (1.4)	31 (4.0)
Australia	51 (2.4)	83 (1.4)	31 (2.5)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

An "r" indicates response data available for 70-84% of students.

England: Question not administered or data not available.

School Location and Size

The school location and size category includes factors that operate at the school level. These are:

- school location
- size of school
- size of class

School Location

At one time, it was accepted that schools located in urban areas, because of their proximity to educational and cultural resources such as libraries and museums, had advantages over those situated in more remote locations. However, with the onset of urban decay in some industrialized countries and the migration of middle-class families to the suburbs, the reputation of urban schools suffered, and often the schools with the best reputation were found in suburban areas. The TIMSS countries vary a great deal in level of urbanization and in the distribution of schools between urban and rural areas, and so the relationship between student achievement and the urbanicity of the school can be expected to vary also.

Principals were asked to indicate the type of community in which the school was located: an isolated area, a village or rural area, the outskirts of a town or city, or close to the center of a town or city. For the purpose of this analysis, the third and fourth categories were combined, and schools in these categories were considered to be in urban areas. Exhibits 1.21 and 1.22 show the percentages of students in high- and low-achieving schools that were located in such an urban area. Although in several countries greater percentages of students in low-achieving schools were located in urban areas, which supports the idea that urban schools are often disadvantaged, only for Scotland in science was the difference statistically significant.[6] In contrast, in seven countries, Austria, Cyprus, Hungary, Iran, Korea (mathematics only), and the Russian Federation, significantly greater percentages of students in the high-achieving schools were in schools located in urban areas. Of these countries, both Iran and the Russian Federation have large tracts of remote areas, and the difference between urban and rural can be very marked.

School Size

Since size is a school characteristic that is directly related to the cost of educational provision, and one that may readily be manipulated by policy makers, it has received a great deal of attention over the years. On one hand, schools must be large enough so that the necessary investment in libraries, laboratories, gymnasia, and the like is economically sound, but on the other hand, schools should not be so large that they

[6] School-related variables such as location and size are based on much smaller sample sizes than student-related variables, and so differences in percentages that would be significant in student samples often are not for school variables.

are organizationally cumbersome, or that students feel isolated. To provide an opportunity to study how school size and student achievement are related in TIMSS, school principals were asked to report the number of boys and girls attending their school. Exhibits 1.23 and 1.24 present the percentages of students in the high- and low-achieving schools that were in large schools. Because school size varies greatly from country to country (in TIMSS, average school size for eighth-grade students ranged from about 180 students in Norway to over 1200 in Singapore), for this report the size of a school was defined in relation to the average school size in each country. Large schools were those with student enrollment greater than the average for the country.

It is noteworthy that in Exhibits 1.23 and 1.24, there seems to be a general tendency for greater percentages of students in high-achieving schools to be in the larger schools in each country, although the difference is statistically significant in less than one third of the schools. Countries where school size differentiates most between high- and low-achieving schools include Austria, Germany, Iran, Korea (mathematics only), and Singapore. These schools span almost the full range of school sizes, from 291 in Iran to 1226 in Singapore.

Class Size

Few school characteristics have received as much attention from the research community as class size. Research syntheses based on rigorous experimental work[7] confirm the commonsense view that students should do better in small classes, although the results from large-scale surveys often paint a different picture. For example, the TIMSS data for Korea show that high average achievement in mathematics and science is possible in countries where large classes are the norm. TIMSS also shows that in many countries, average achievement is higher among students in larger classes. This finding may owe less to any possible superiority of large classes for instruction and more to the practice among schools of using smaller classes for weaker students or for remedial classes, but whatever the reason, the relationship seems to be widespread.

Exhibits 1.25 and 1.26 present the percentages of students in the high- and low-achieving schools that are in large classes. Again, because of the wide range of average class sizes across countries (from 15 in Iceland and Lithuania to 46 in Korea), large classes were defined as those above the average in each country. On average, 79 percent of students in high-achieving schools were in larger science classes, compared with 61 percent in low-achieving schools, a difference of 17 percentage points. In mathematics classes, the percentages in high- and low-achieving schools were 80 and 59, respectively, a difference of 21 percentage points. Significantly greater percentages of students in the high-achieving schools were in larger than average mathematics classes in nine countries, and in larger science

[7] Glass, G.V. and Smith, M.L. (1978). *Meta-analysis of Research on the Relationship of Class-size and Achievement,* Far West Laboratory for Educational Research and Development, San Francisco, CA.

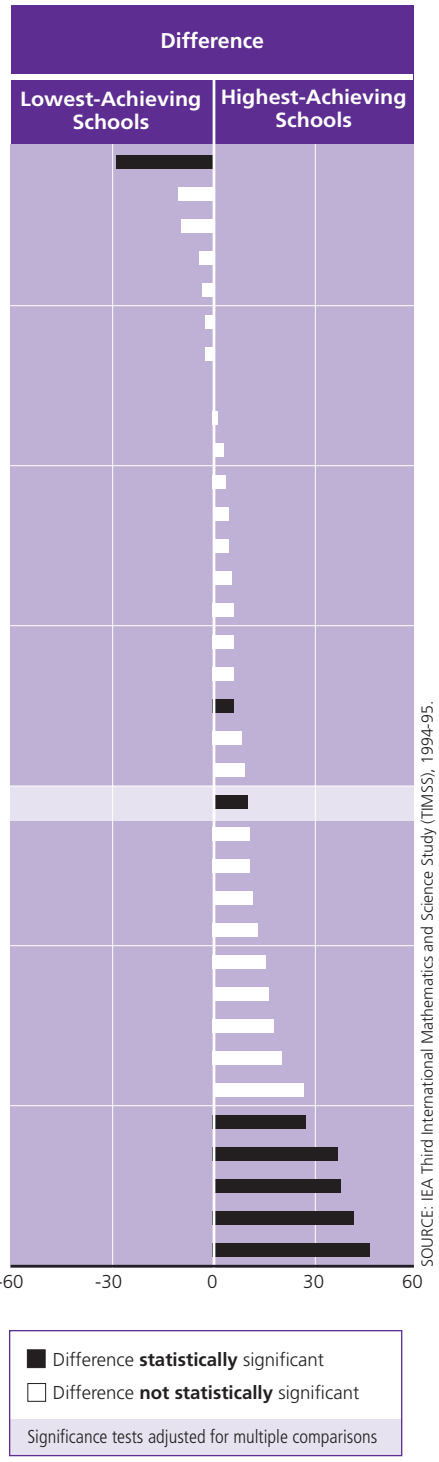
classes in four countries. In Belgium (French), Belgium (Flemish), the Netherlands, and Hong Kong, at least 80% of the students in the high-achieving schools were in larger than average classes, while 50% or less of the students in the low-achieving schools were in large classes. In Lithuania and Korea, all students in the high-achieving schools were in mathematics classes that were larger than average.

Exhibit 1.21 - 1.26 Overleaf

Exhibit 1.21 Percent of Students in Schools Located in Urban Areas[1]

Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Scotland	100 (0.0)	r 71 (8.2)	-29 (8.2)
United States	r 83 (6.2)	73 (6.1)	-11 (8.7)
Norway	46 (8.1)	37 (7.1)	-9 (10.8)
England	92 (4.5)	r 88 (7.5)	-4 (8.7)
New Zealand	86 (4.6)	83 (5.4)	-3 (7.1)
Netherlands	r 63 (14.3)	r 60 (9.0)	-3 (16.9)
Canada	r 86 (4.4)	84 (4.0)	-3 (5.9)
Singapore	100 (0.0)	100 (0.0)	0 (0.0)
France	68 (8.4)	69 (7.6)	1 (11.4)
Germany	s 80 (7.4)	s 83 (6.6)	3 (9.9)
Sweden	85 (6.4)	89 (5.5)	4 (8.5)
Belgium (Fl)	66 (9.0)	71 (6.8)	4 (11.3)
Romania	63 (6.3)	68 (6.2)	5 (8.9)
Ireland	74 (7.0)	79 (6.7)	5 (9.7)
Australia	83 (5.9)	r 89 (5.8)	6 (8.3)
Switzerland	57 (6.5)	r 63 (7.2)	6 (9.7)
Portugal	86 (5.3)	93 (4.1)	7 (6.7)
Hong Kong	93 (1.1)	100 (0.0)	7 (1.1)
Czech Republic	82 (5.6)	91 (4.0)	9 (6.9)
Belgium (Fr)	r 71 (9.9)	r 80 (7.6)	9 (12.5)
International Avg.	70 (1.2)	80 (1.0)	10 (1.5)
Iceland	r 79 (4.4)	90 (2.0)	11 (4.8)
Japan	75 (5.6)	86 (4.2)	11 (7.0)
Slovak Republic	62 (6.2)	74 (7.7)	12 (9.9)
Lithuania	63 (7.0)	77 (6.2)	13 (9.3)
Korea	73 (5.4)	89 (6.0)	16 (8.0)
Latvia (LSS)	43 (7.0)	r 60 (7.4)	17 (10.2)
Slovenia	60 (7.7)	r 79 (5.7)	18 (9.6)
Spain	46 (8.1)	66 (7.7)	21 (11.2)
Colombia	66 (8.4)	92 (4.2)	27 (9.4)
Russian Federation	62 (5.8)	89 (3.4)	28 (6.7)
Cyprus	r 60 (0.8)	s 97 (0.1)	37 (0.8)
Iran, Islamic Rep.	50 (8.4)	88 (5.0)	38 (9.8)
Austria	44 (6.9)	r 86 (5.4)	42 (8.7)
Hungary	43 (5.6)	90 (4.3)	47 (7.1)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 Urban area includes outskirts and areas close to the center of a town/city.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

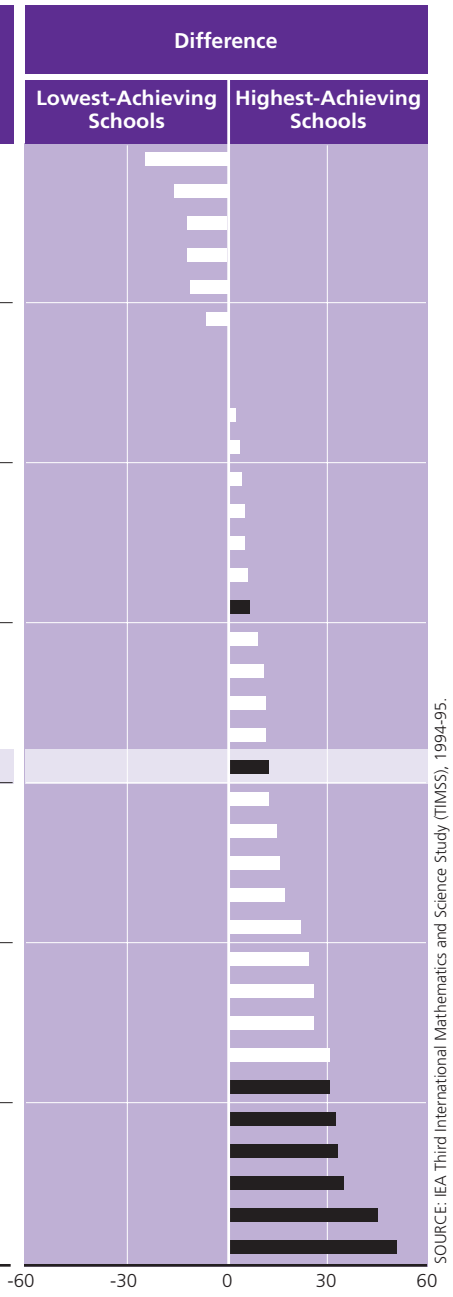
Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

An "r" indicates response data available for 70-84% of students. An "s" indicates response data available for 50-69% of students.

Exhibit 1.22 Percent of Students in Schools Located in Urban Areas[1]

Schools with the Lowest and Highest Achievement - Eighth Grade* - Mathematics

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Scotland	97 (3.4)	r 73 (8.2)	-24 (8.8)
France	73 (8.1)	58 (9.5)	-15 (12.9)
England	93 (4.9)	r 81 (7.7)	-12 (9.2)
Norway	49 (7.5)	r 37 (7.3)	-11 (10.6)
Canada	r 88 (3.2)	r 77 (4.9)	-11 (5.9)
United States	r 81 (6.1)	76 (5.2)	-6 (8.3)
Netherlands	r 63 (15.1)	r 63 (9.2)	0 (17.8)
Singapore	100 (0.0)	100 (0.0)	0 (0.0)
Belgium (Fl)	68 (8.2)	71 (6.4)	3 (9.9)
Czech Republic	84 (5.7)	87 (5.2)	3 (8.3)
Portugal	86 (5.1)	91 (4.5)	5 (6.8)
Germany	s 77 (7.8)	s 82 (7.0)	5 (10.5)
Switzerland	61 (7.1)	66 (6.1)	5 (9.3)
Belgium (Fr)	s 73 (10.8)	79 (6.4)	6 (12.2)
Hong Kong	93 (1.1)	100 (0.0)	7 (1.1)
Sweden	77 (5.8)	87 (4.8)	9 (6.6)
New Zealand	79 (5.2)	89 (4.6)	10 (7.5)
Ireland	73 (7.4)	85 (6.0)	11 (10.1)
Australia	76 (6.2)	r 87 (5.0)	11 (6.8)
International Avg.	69 (1.2)	81 (1.0)	12 (1.6)
Iceland	r 79 (4.9)	91 (2.0)	13 (5.7)
Colombia	72 (7.6)	86 (5.5)	14 (9.9)
Slovak Republic	63 (6.5)	78 (7.0)	16 (10.3)
Japan	73 (6.0)	89 (3.6)	17 (6.7)
Lithuania	58 (6.4)	80 (5.7)	22 (9.1)
Romania	57 (6.4)	81 (5.0)	24 (8.6)
Spain	44 (8.0)	70 (7.2)	26 (10.6)
Latvia (LSS)	34 (7.1)	r 60 (6.7)	26 (9.9)
Slovenia	51 (7.8)	r 82 (6.8)	31 (12.1)
Cyprus	65 (5.2)	s 96 (3.1)	31 (6.1)
Austria	54 (7.1)	r 87 (2.6)	32 (7.6)
Hungary	50 (5.7)	83 (5.4)	33 (9.4)
Russian Federation	55 (6.5)	89 (3.8)	34 (7.4)
Korea	55 (7.1)	100 (0.0)	45 (7.1)
Iran, Islamic Rep.	42 (7.6)	93 (4.6)	51 (9.2)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 Urban area includes outskirts and areas close to the center of a town/city.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

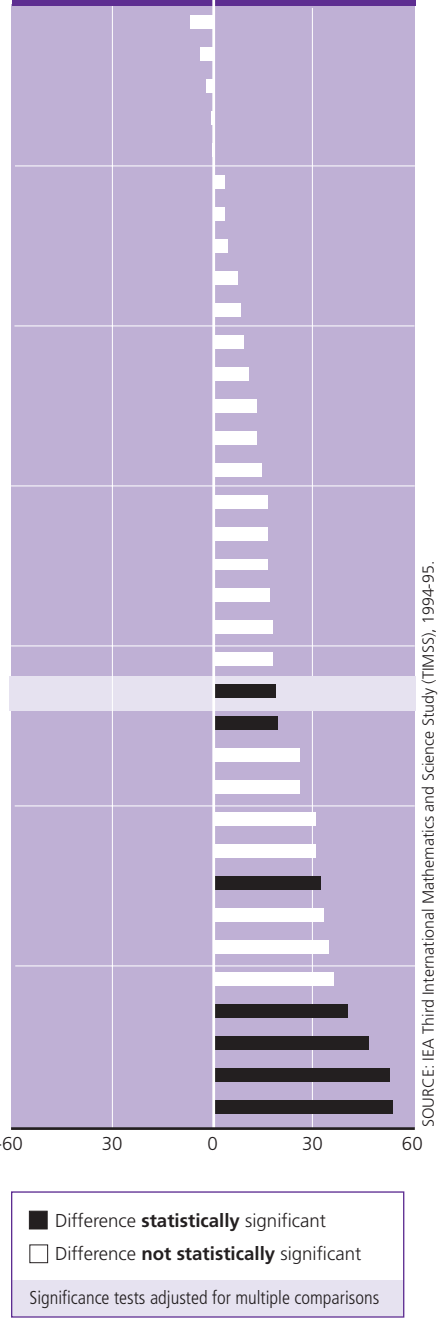
Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

An "r" indicates response data available for 70-84% of students. An "s" indicates response data available for 50-69% of students.

Exhibit 1.23 Percent of Students in Schools with Enrollment Greater Than the Country Mean[1]

Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Mean	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Switzerland	291	48 (7.4)	r 41 (5.3)	-7 (9.1)
Sweden	276	r 88 (5.5)	85 (5.7)	-3 (7.9)
United States	498	s 71 (7.6)	r 68 (6.8)	-2 (10.2)
New Zealand	361	95 (2.7)	95 (2.1)	0 (3.4)
Canada	401	r 61 (8.5)	62 (5.5)	1 (10.1)
Portugal	915	r 65 (7.9)	68 (6.8)	3 (10.4)
Norway	151	r 78 (6.4)	r 81 (6.2)	4 (8.9)
England	639	r 69 (7.6)	r 73 (8.4)	4 (11.3)
France	471	60 (5.9)	67 (7.8)	7 (9.8)
Slovenia	487	62 (7.3)	r 71 (7.9)	9 (10.7)
Czech Republic	464	56 (10.2)	66 (6.9)	9 (12.3)
Romania	393	59 (6.1)	69 (6.0)	10 (8.6)
Iceland	249	r 73 (5.2)	86 (2.7)	13 (5.8)
Japan	461	65 (4.9)	79 (5.0)	13 (7.1)
Scotland	733	62 (6.9)	r 77 (6.6)	15 (9.6)
Spain	413	55 (6.4)	71 (6.3)	16 (9.0)
Ireland	454	s 51 (11.1)	s 67 (8.1)	16 (13.8)
Latvia (LSS)	286	r 58 (7.7)	r 75 (6.3)	17 (10.0)
Slovak Republic	435	58 (5.9)	75 (5.7)	17 (8.2)
Australia	686	63 (7.6)	r 80 (6.9)	18 (10.3)
Russian Federation	663	61 (6.3)	79 (6.9)	18 (9.3)
International Avg.	493	58 (1.3)	77 (1.1)	19 (1.7)
Cyprus	521	r 56 (0.8)	s 75 (0.6)	19 (1.1)
Lithuania	335	64 (6.6)	90 (4.8)	26 (8.1)
Korea	964	63 (6.7)	89 (6.5)	26 (9.4)
Belgium (Fl)	464	43 (8.1)	74 (6.7)	31 (10.6)
Belgium (Fr)	525	r 42 (10.9)	r 73 (8.4)	31 (13.7)
Hungary	368	53 (6.4)	85 (5.1)	32 (8.1)
Netherlands	774	s 53 (14.3)	s 85 (6.6)	33 (15.7)
Colombia	541	r 44 (10.7)	s 79 (6.5)	35 (12.5)
Hong Kong	1056	55 (10.4)	r 91 (5.7)	36 (11.9)
Iran, Islamic Rep.	291	40 (7.4)	80 (5.9)	40 (9.4)
Singapore	1226	37 (7.6)	83 (4.7)	47 (8.9)
Austria	288	r 34 (7.9)	r 87 (7.7)	53 (11.1)
Germany	514	s 26 (10.0)	s 80 (5.5)	54 (11.4)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 The percent of students in schools whose total enrollment is greater than the mean of the country's school enrollment for all participating schools.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

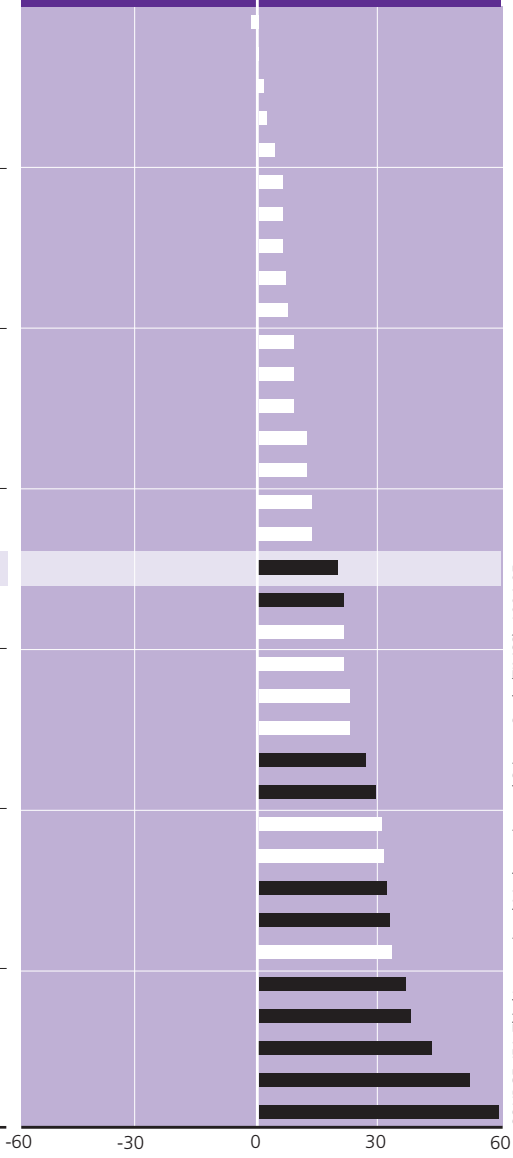
Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

An "r" indicates response data available for 70-84% of students. An "s" indicates response data available for 50-69% of students.

Exhibit 1.24 Percent of Students in Schools with Enrollment Greater Than the Country Mean[1]

Schools with the Lowest and Highest Achievement – Eighth Grade* – Mathematics

Country	Mean	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Switzerland	291	49 (8.1)	r 47 (5.2)	-2 (9.8)
Norway	151	r 77 (4.6)	r 77 (6.2)	0 (8.0)
United States	498	s 70 (6.6)	r 72 (6.4)	2 (9.2)
England	639	71 (7.6)	r 74 (7.1)	3 (10.5)
Portugal	915	r 64 (8.0)	70 (7.9)	6 (11.6)
Japan	461	67 (6.5)	74 (4.9)	7 (9.5)
New Zealand	361	90 (4.3)	98 (2.1)	8 (4.8)
Spain	413	60 (5.8)	r 68 (4.8)	8 (7.9)
Sweden	276	r 81 (5.9)	89 (4.3)	8 (6.3)
France	471	57 (6.5)	66 (7.2)	9 (10.4)
Slovenia	487	55 (7.3)	r 65 (7.9)	10 (11.8)
Czech Republic	464	55 (8.8)	66 (6.4)	11 (11.8)
Cyprus	521	r 57 (5.7)	s 68 (6.0)	11 (9.4)
Ireland	454	s 51 (10.6)	r 65 (8.1)	14 (14.3)
Slovak Republic	435	60 (5.9)	76 (4.6)	15 (8.3)
Scotland	733	57 (8.4)	r 74 (5.9)	16 (11.2)
Australia	686	63 (7.1)	r 80 (5.0)	17 (8.2)
International Avg.	493	54 (1.4)	78 (1.0)	24 (1.7)
Canada	401	r 55 (6.6)	81 (3.6)	26 (7.6)
Romania	393	53 (5.9)	79 (5.1)	26 (9.0)
Russian Federation	663	56 (6.1)	82 (4.9)	27 (8.5)
Belgium (Fl)	464	44 (8.0)	72 (6.3)	28 (10.3)
Iceland	249	r 54 (10.1)	82 (6.5)	28 (13.8)
Hungary	368	54 (5.7)	87 (4.8)	33 (7.9)
Latvia (LSS)	286	r 41 (8.5)	r 77 (5.6)	36 (10.2)
Colombia	541	r 45 (10.2)	s 82 (6.8)	37 (12.2)
Belgium (Fr)	525	s 38 (11.2)	r 76 (7.4)	38 (13.6)
Lithuania	335	51 (6.2)	90 (4.8)	39 (8.5)
Hong Kong	1056	53 (10.6)	r 93 (5.3)	40 (11.5)
Netherlands	774	s 46 (14.6)	r 87 (6.7)	41 (16.1)
Singapore	1226	39 (7.7)	84 (4.4)	45 (9.1)
Iran, Islamic Rep.	291	35 (6.5)	81 (6.0)	46 (9.3)
Korea	964	45 (8.0)	98 (2.0)	53 (8.2)
Germany	514	s 25 (9.9)	s 89 (3.7)	64 (10.6)
Austria	288	r 25 (7.3)	r 98 (1.5)	73 (7.4)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 The percent of students in schools whose total enrollment is greater than the mean of the country's school enrollment for all participating schools.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

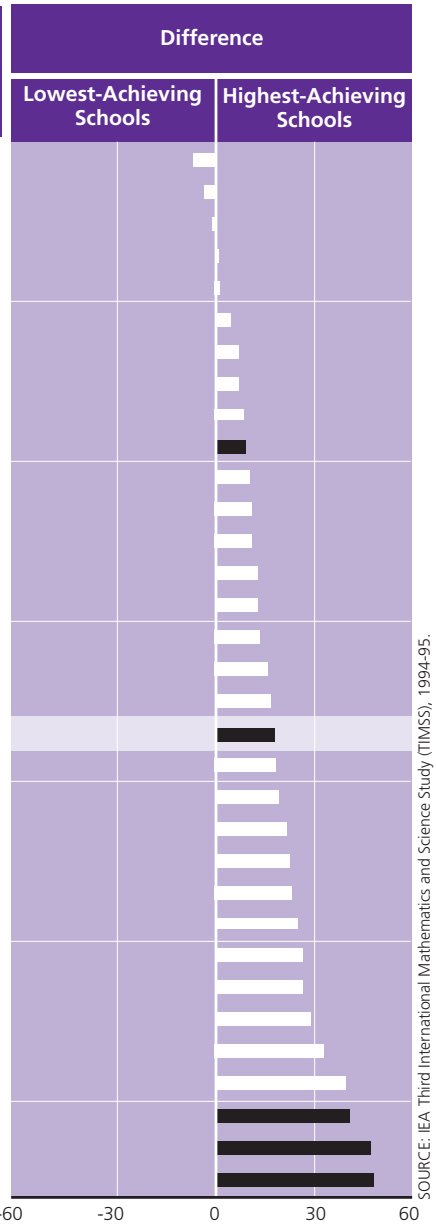
Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

An "r" indicates response data available for 70-84% of students. An "s" indicates response data available for 50-69% of students.

Exhibit 1.25 Percent of Students in Schools with Average Class Sizes Greater Than the Country Mean[1]

Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Mean	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Singapore	36	72 (6.4)	66 (7.4)	-6 (9.8)
United States	24	r 68 (5.4)	64 (6.9)	-3 (8.7)
Romania	19	77 (5.1)	77 (5.3)	-1 (7.3)
Scotland	24	79 (7.3)	s 80 (6.7)	1 (9.9)
Norway	19	82 (5.1)	84 (5.8)	2 (7.7)
Latvia (LSS)	16	r 72 (6.3)	r 77 (5.6)	5 (8.4)
Switzerland	17	79 (5.4)	r 85 (4.2)	7 (6.8)
Portugal	25	68 (7.1)	75 (6.4)	7 (9.5)
Iceland	15	r 82 (4.5)	91 (1.9)	9 (4.9)
Cyprus	30	r 66 (1.2)	s 75 (1.1)	9 (1.6)
Canada	25	r 64 (8.9)	74 (5.9)	10 (10.7)
New Zealand	25	63 (7.1)	75 (6.1)	11 (9.4)
Slovenia	22	71 (7.2)	r 83 (6.5)	12 (9.7)
Iran, Islamic Rep.	31	63 (7.4)	75 (6.9)	13 (10.1)
Korea	46	78 (4.4)	91 (5.8)	13 (7.3)
France	25	49 (6.9)	63 (8.1)	14 (10.6)
Russian Federation	22	65 (6.9)	81 (5.3)	16 (8.7)
Slovak Republic	24	61 (6.4)	78 (6.9)	17 (9.5)
International Avg.	26	61 (1.4)	79 (1.1)	17 (1.8)
Sweden	24	63 (9.0)	82 (5.0)	19 (10.3)
Lithuania	15	76 (5.6)	96 (2.9)	20 (6.4)
Austria	24	s 42 (9.9)	s 64 (10.7)	22 (14.6)
Spain	27	50 (7.3)	73 (6.7)	23 (9.9)
Germany	24	s 59 (9.7)	s 83 (7.1)	24 (12.0)
Australia	26	49 (7.5)	r 74 (7.6)	25 (10.7)
Czech Republic	25	39 (10.8)	66 (8.3)	27 (13.6)
Japan	35	54 (7.7)	81 (4.7)	27 (9.0)
Colombia	33	s 56 (14.1)	s 86 (7.8)	29 (16.1)
Ireland	26	38 (8.3)	71 (7.1)	33 (10.9)
Hong Kong	40	50 (10.7)	90 (6.9)	40 (12.7)
Netherlands	25	s 49 (10.2)	r 90 (6.7)	41 (12.2)
Belgium (Fl)	18	r 39 (9.0)	r 86 (5.4)	47 (10.5)
Belgium (Fr)	19	r 42 (8.9)	r 90 (5.5)	48 (10.5)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 The percent of students in classes whose size is greater than the mean of the country's class size for all participating schools.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

An "r" indicates response data available for 70-84% of students. An "s" indicates response data available for 50-69% of students.

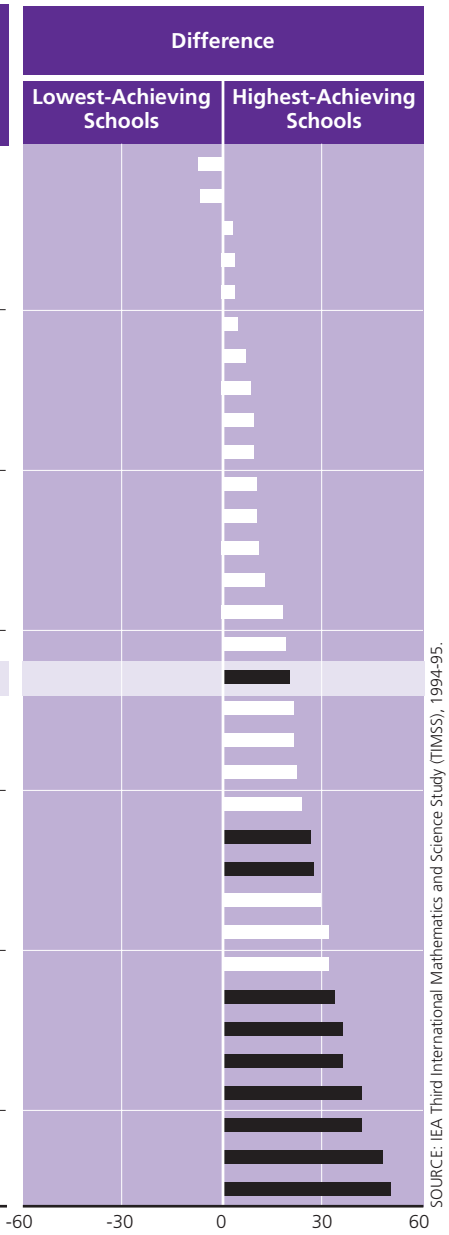
England and Hungary: Question not administered or data not available.

Exhibit 1.26

Percent of Students in Schools with Average Class Sizes Greater Than the Country Mean[1]

Schools with the Lowest and Highest Achievement – Eighth Grade* – Mathematics

Country	Mean	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
United States	24	s 73 (4.3)	r 65 (5.4)	-7 (6.6)
Singapore	36	66 (7.4)	61 (7.8)	-6 (10.7)
Slovak Republic	24	63 (6.2)	67 (7.2)	4 (9.8)
Scotland	24	83 (6.3)	r 87 (4.9)	4 (7.9)
Romania	19	78 (5.3)	82 (5.4)	4 (8.8)
Portugal	25	68 (7.1)	74 (7.4)	5 (10.2)
France	25	53 (6.7)	61 (7.7)	8 (10.2)
Switzerland	17	r 73 (5.6)	r 83 (5.1)	10 (7.6)
Cyprus	30	s 68 (5.8)	s 78 (2.4)	10 (6.7)
Norway	19	76 (5.1)	r 87 (5.3)	10 (7.6)
Sweden	24	r 65 (7.0)	76 (5.2)	11 (7.6)
Iceland	15	r 80 (4.1)	91 (2.1)	11 (5.2)
Latvia (LSS)	16	r 70 (7.2)	r 82 (4.6)	12 (8.9)
Austria	24	s 47 (12.9)	r 60 (10.5)	13 (16.6)
Slovenia	22	58 (7.9)	r 77 (7.6)	19 (11.3)
Russian Federation	22	64 (6.8)	83 (4.7)	19 (7.8)
International Avg.	26	59 (1.4)	80 (1.0)	21 (1.8)
Japan	35	59 (7.5)	81 (4.3)	22 (8.9)
Iran, Islamic Rep.	31	60 (7.3)	82 (5.3)	22 (8.9)
New Zealand	25	53 (7.4)	76 (6.2)	23 (10.7)
Germany	24	s 58 (9.6)	s 82 (7.0)	24 (11.9)
Australia	26	52 (6.9)	r 79 (5.5)	27 (7.9)
Canada	25	r 54 (8.0)	82 (3.3)	28 (8.5)
Colombia	33	s 54 (13.4)	s 84 (7.3)	30 (15.3)
Spain	27	44 (7.8)	r 77 (6.0)	33 (10.4)
Ireland	26	38 (8.2)	70 (6.7)	33 (11.2)
Lithuania	15	66 (5.5)	100 (0.0)	34 (5.5)
Czech Republic	25	32 (8.3)	69 (7.4)	36 (11.2)
Korea	46	63 (7.3)	100 (0.0)	37 (7.3)
Belgium (Fr)	19	s 39 (9.3)	r 81 (8.1)	42 (12.1)
Netherlands	25	s 47 (11.0)	r 89 (6.5)	42 (12.9)
Belgium (Fl)	18	r 38 (8.3)	86 (5.1)	49 (9.9)
Hong Kong	40	44 (10.9)	96 (3.9)	51 (10.9)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 The percent of students in classes whose size is greater than the mean of the country's class size for all participating schools.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

An "r" indicates response data available for 70-84% of students. An "s" indicates response data available for 50-69% of students.

England and Hungary: Question not administered or data not available.

School Social Climate

The school-climate literature is concerned with the psychological context in which school behavior is embedded. School climate is considered to be a relatively enduring quality of the school that is experienced by the teachers and students, influences their behavior, and can be described in terms of the shared values of the school community.[8] School climate has many aspects, but there is broad agreement that a positive school climate embodies respect for the individual student and a safe and orderly learning environment. School social climate, as used in this study, focuses on these factors. Research indicates that the safe and orderly learning environment of an effective school has a positive effect on the behavior and academic performance of students.[9] When a school is forced to focus on keeping order, it often fails not only to achieve that goal, but also the more fundamental goal of academic achievement.[10]

The school-social-climate category here consists of two indicators:

- serious student misbehavior
- administrative violations

Serious Student Misbehavior.
Principals were asked to indicate the frequency of inappropriate student behavior that was directed at either another person or the property of others. Such behavior included classroom disturbance, cheating, profanity, vandalism, theft, intimidation or verbal abuse of other students, and physical injury to other students. TIMSS combined these into a single indicator of how often school principals reported having to deal with serious student misbehavior. The percentages of students in schools where such misconduct was reported often are shown in Exhibits 1.27 and 1.28. Although on average more principals in the lowest-achieving schools reported dealing often with serious student misbehavior, the difference was not statistically significant in most countries. For science achievement, the problem of serious student misconduct was reported more frequently in the lower-achieving schools in Canada, Cyprus, and Hong Kong, and for mathematics, in Hong Kong and Singapore.

Administrative Violations
Frequent less serious student misbehavior can also be indicative of a school learning environment that is less than orderly and in which high levels of student achievement may be difficult to sustain. To examine this issue, four violations – arriving late for school, absenteeism, skipping class, and violating the school dress code – were collected into a single index. This index has been labeled "administra-

[8] Owens, R. G. (1991). *Organizational Behavior in Education*, Fourth Ed., New Jersey: Prentice-Hall.

[9] Witcher, A. E. (1993). "Assessing School Climate: An Important Step for Enhancing School Quality". *NASSP Bulletin*, Vol. 77, No. 554, 1-5

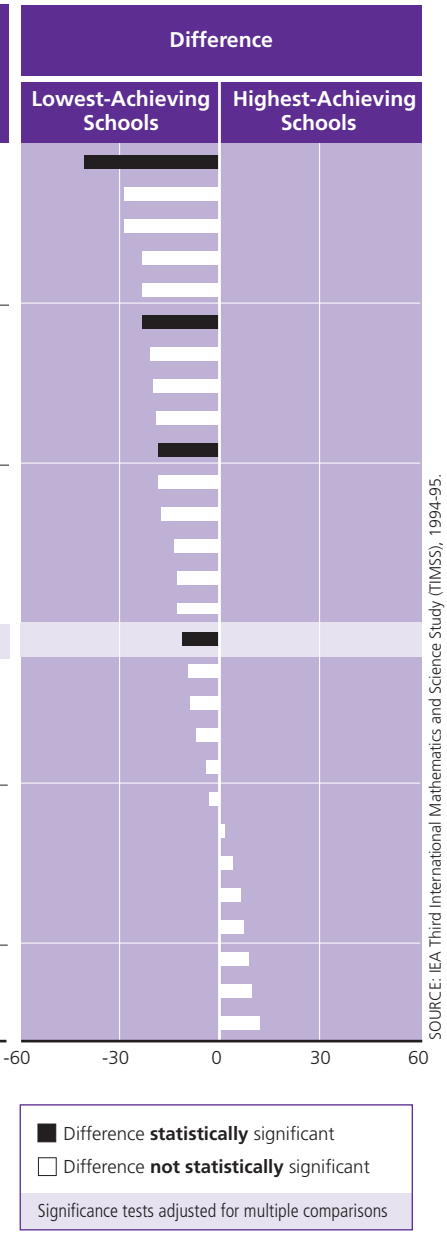
[10] Gaddy, G. D. (1988). "High School Order and Academic Achievement." *American Journal of Education*, Vol. 96, No. 4, 496-518.

tive violations." Exhibits 1.29 and 1.30 show the percentages of students who were in schools where principals reported dealing often with such violations. As was the case with serious student misbehavior, on average, more principals in the low-achieving schools reported dealing often with student administrative violations, but again the difference was not statistically significant in most countries. Only in Australia, Canada, Cyprus, and Singapore was there a significant difference for science achievement, and only in Spain and Singapore for mathematics.

Exhibit 1.27 Percent of Students in Schools Reporting Often Dealing with Serious Student Misbehavior[1]

Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Lowest Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Hong Kong	68 (9.0)	27 (8.6)	-41 (12.5)
Netherlands	s 92 (5.7)	r 63 (10.9)	-29 (12.3)
Singapore	49 (7.9)	21 (6.5)	-28 (10.2)
Slovenia	r 69 (9.2)	r 46 (9.9)	-23 (13.5)
Australia	90 (4.7)	r 67 (7.3)	-23 (8.7)
Canada	r 87 (3.4)	r 64 (6.4)	-23 (7.2)
Latvia (LSS)	s 78 (8.5)	s 58 (10.9)	-20 (13.9)
Austria	74 (6.8)	54 (10.1)	-20 (12.1)
Ireland	69 (7.5)	50 (7.9)	-19 (10.9)
Cyprus	r 70 (0.9)	s 52 (1.4)	-19 (1.6)
United States	r 87 (3.8)	69 (6.1)	-18 (7.2)
New Zealand	89 (4.7)	72 (6.5)	-17 (8.1)
Slovak Republic	58 (7.2)	r 45 (9.0)	-13 (11.5)
Portugal	r 51 (8.7)	38 (7.2)	-13 (11.3)
Czech Republic	71 (6.6)	58 (8.3)	-12 (10.6)
International Avg.	63 (1.5)	52 (1.6)	-11 (2.2)
Spain	44 (7.3)	r 35 (8.0)	-9 (10.8)
Iceland	r 57 (8.9)	48 (11.0)	-9 (14.1)
Switzerland	r 76 (7.9)	s 69 (7.2)	-7 (10.7)
Russian Federation	s 25 (8.1)	r 21 (7.0)	-4 (10.7)
Belgium (Fl)	59 (6.7)	56 (8.7)	-3 (10.9)
Belgium (Fr)	r 60 (11.1)	r 62 (9.0)	2 (14.3)
France	56 (7.6)	r 60 (9.6)	5 (12.3)
Colombia	s 45 (11.5)	s 51 (8.7)	7 (14.4)
Iran, Islamic Rep.	s 43 (12.3)	r 51 (9.0)	8 (15.3)
Sweden	59 (7.8)	68 (7.4)	10 (10.7)
Lithuania	s 34 (8.7)	r 44 (8.5)	10 (12.1)
Korea	39 (7.5)	51 (7.3)	12 (10.4)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 Index is based on mean frequency of occurance, as reported by school principals, of the following items: 1) classroom disturbance; 2) cheating; 3) profanity; 4) vandalism; 5) theft; 6) intimidation or verbal abuse of other students; 7) physical injury to other students.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

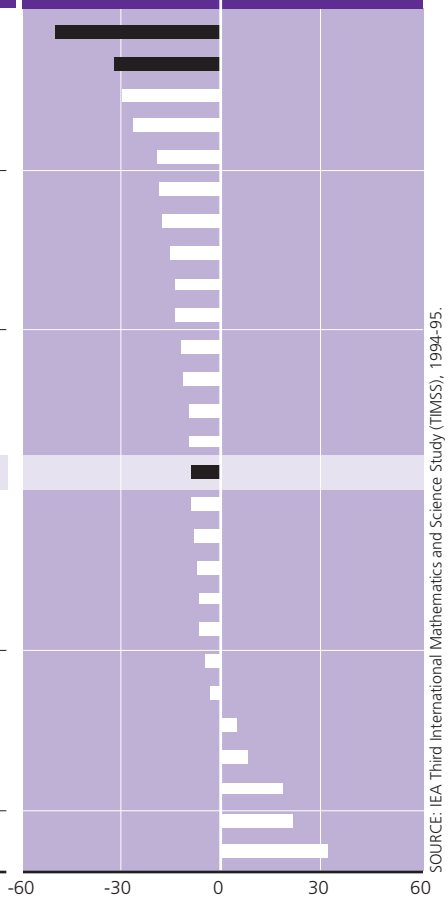
An "r" indicates response data available for 70-84% of students. An "s" indicates response data available for 50-69% of students.

England, Germany, Hungary, Japan, Norway, Romania and Scotland: Question not administered or data not available.

Exhibit 1.28 Percent of Students in Schools Reporting Often Dealing with Serious Student Misbehavior[1]

Schools with the Lowest and Highest Achievement – Eighth Grade* – Mathematics

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Hong Kong	74 (8.3)	25 (8.4)	-50 (12.1)
Singapore	52 (8.0)	20 (6.3)	-32 (9.6)
Portugal	62 (7.2)	r 32 (7.8)	-30 (10.3)
Netherlands	s 85 (8.3)	r 58 (10.5)	-27 (12.9)
Russian Federation	s 33 (8.7)	s 14 (5.4)	-19 (9.6)
Slovak Republic	r 60 (7.6)	42 (7.7)	-18 (10.5)
Australia	90 (4.3)	r 72 (5.8)	-17 (6.5)
Belgium (Fl)	66 (7.0)	51 (7.8)	-15 (10.6)
Ireland	68 (7.6)	54 (8.1)	-14 (10.6)
New Zealand	83 (5.1)	69 (7.0)	-14 (8.8)
Canada	r 83 (4.1)	r 71 (6.4)	-12 (7.6)
Cyprus	66 (5.6)	s 55 (5.9)	-11 (9.2)
Iceland	r 53 (10.1)	43 (12.2)	-10 (17.4)
Switzerland	r 78 (7.5)	s 68 (5.7)	-10 (9.2)
International Avg.	62 (1.5)	52 (1.6)	-9 (2.2)
Austria	69 (6.7)	60 (10.2)	-9 (12.2)
France	60 (7.0)	52 (8.4)	-8 (11.0)
Belgium (Fr)	r 65 (12.4)	r 58 (9.0)	-7 (15.0)
Korea	53 (8.6)	47 (7.5)	-6 (11.4)
Czech Republic	66 (8.1)	60 (7.3)	-6 (11.5)
United States	r 80 (4.9)	74 (5.9)	-5 (6.9)
Spain	48 (7.1)	r 46 (7.6)	-3 (10.3)
Sweden	65 (6.8)	70 (7.4)	5 (8.3)
Colombia	r 40 (10.6)	s 48 (8.5)	8 (13.9)
Iran, Islamic Rep.	s 33 (8.9)	r 51 (10.9)	18 (14.8)
Slovenia	s 45 (10.6)	r 67 (8.1)	22 (13.6)
Lithuania	s 23 (7.8)	r 55 (9.1)	32 (12.4)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 Index is based on mean frequency of occurance, as reported by school principals, of the following items: 1) classroom disturbance; 2) cheating; 3) profanity; 4) vandalism; 5) theft; 6) intimidation or verbal abuse of other students; 7) physical injury to other students.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

An "r" indicates response data available for 70-84% of students. An "s" indicates response data available for 50-69% of students.

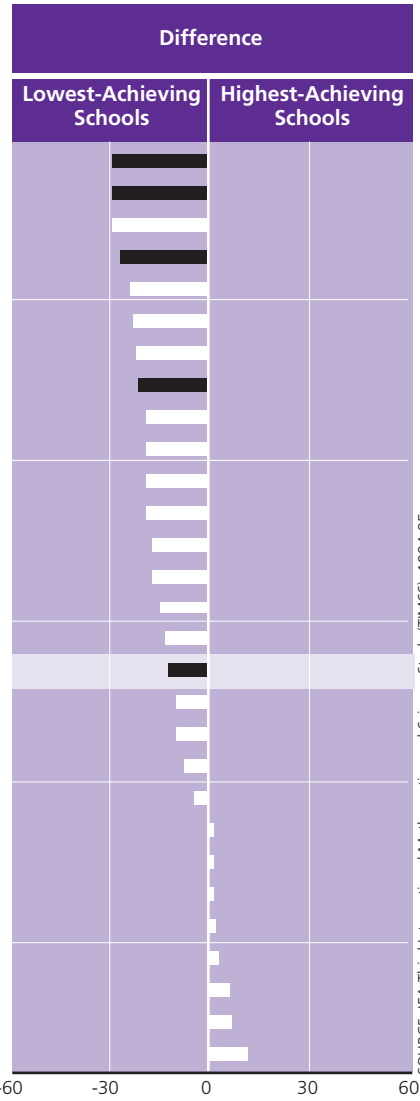
England, Germany, Hungary, Japan, Norway, Romania and Scotland: Question not administered or data not available.

Exhibit 1.29

Percent of Students in Schools Often Reporting Dealing with Student Administrative Violations[1]

Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Canada	r 89 (3.4)	r 60 (5.8)	-29 (6.7)
Singapore	89 (4.7)	60 (7.2)	-29 (8.6)
Spain	r 47 (8.3)	r 18 (6.6)	-29 (10.6)
Cyprus	r 79 (0.9)	s 53 (1.4)	-26 (1.6)
United States	r 84 (5.5)	60 (5.6)	-23 (7.8)
Belgium (Fl)	47 (7.2)	25 (8.5)	-22 (11.2)
Latvia (LSS)	r 73 (7.5)	r 52 (9.2)	-22 (11.9)
Australia	98 (2.0)	r 77 (5.9)	-21 (6.2)
France	50 (9.1)	r 32 (9.0)	-19 (12.8)
Switzerland	r 32 (6.7)	s 13 (5.5)	-18 (8.6)
Belgium (Fr)	r 66 (12.0)	r 48 (9.6)	-18 (15.3)
Netherlands	s 79 (10.6)	r 61 (10.1)	-18 (14.7)
Hong Kong	81 (7.9)	65 (10.4)	-17 (13.1)
Czech Republic	25 (7.3)	9 (3.6)	-16 (8.2)
Slovenia	r 74 (8.3)	r 59 (9.5)	-14 (12.6)
New Zealand	97 (2.2)	85 (5.0)	-12 (5.5)
International Avg.	63 (1.4)	52 (1.4)	-12 (2.0)
Russian Federation	74 (6.4)	64 (8.4)	-10 (10.6)
Sweden	67 (9.0)	58 (7.3)	-9 (11.6)
Ireland	84 (6.4)	77 (6.2)	-7 (8.9)
Portugal	r 33 (8.5)	29 (7.2)	-4 (11.1)
Iceland	r 62 (8.4)	63 (11.8)	2 (14.5)
Romania	51 (6.7)	r 53 (8.1)	2 (10.6)
Austria	34 (5.9)	36 (7.4)	2 (9.5)
Slovak Republic	13 (4.7)	15 (4.8)	2 (6.7)
Iran, Islamic Rep.	s 31 (11.2)	34 (6.7)	3 (13.0)
Colombia	s 71 (13.4)	s 77 (7.0)	6 (15.2)
Korea	67 (7.0)	75 (6.1)	7 (9.3)
Lithuania	73 (6.5)	85 (5.5)	12 (8.5)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 Index is based on mean frequency of occurrence, as reported by school principals, of the following items: 1) arriving late at school; 2) absenteeism; 3) skipping class; and 4) violating dressing code.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

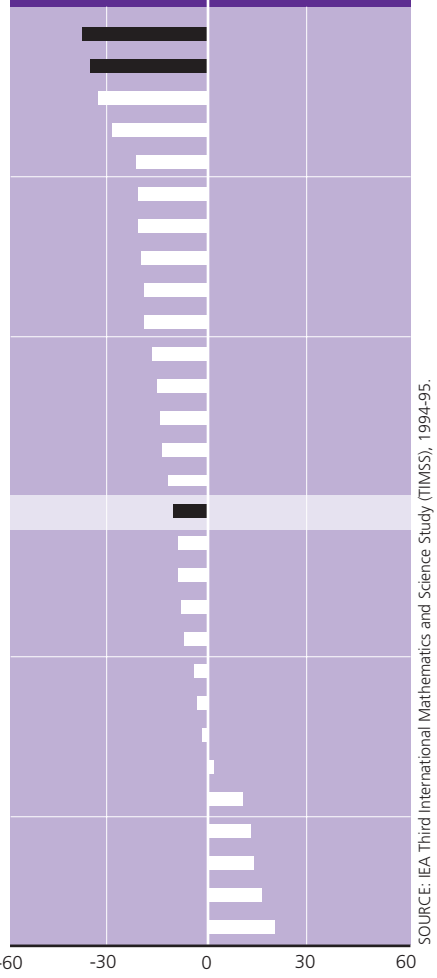
An "r" indicates response data available for 70-84% of students. An "s" indicates response data available for 50-69% of students.

England, Germany, Hungary, Japan, Norway and Scotland: Question not administered or data not available.

Exhibit 1.30 Percent of Students in Schools Reporting Often Dealing with Student Administrative Violations[1]

Schools with the Lowest and Highest Achievement – Eighth Grade* – Mathematics

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Spain	r 54 (8.2)	r 17 (6.0)	-37 (10.1)
Singapore	90 (4.8)	55 (7.5)	-35 (8.5)
Hong Kong	93 (5.4)	61 (9.7)	-32 (10.9)
Belgium (Fr)	r 71 (12.4)	r 42 (8.1)	-28 (14.4)
Cyprus	r 85 (4.1)	s 64 (5.8)	-21 (8.1)
Russian Federation	77 (7.2)	57 (9.3)	-20 (12.4)
Belgium (Fl)	45 (7.6)	25 (8.0)	-20 (11.1)
Czech Republic	24 (7.5)	4 (2.3)	-20 (8.1)
Netherlands	s 79 (10.7)	r 60 (9.7)	-19 (14.9)
France	48 (8.6)	29 (7.1)	-19 (11.2)
United States	r 86 (4.0)	69 (5.4)	-16 (6.7)
Switzerland	r 35 (7.2)	r 20 (4.9)	-15 (8.7)
Canada	r 82 (4.3)	r 68 (4.9)	-14 (6.5)
Portugal	r 33 (8.2)	r 20 (6.8)	-13 (10.7)
Australia	96 (2.8)	r 84 (3.8)	-11 (4.2)
International Avg.	63 (1.4)	53 (1.3)	-10 (2.0)
Ireland	86 (6.0)	78 (6.7)	-9 (8.9)
Latvia (LSS)	70 (7.7)	s 62 (8.7)	-8 (11.6)
Romania	59 (6.8)	51 (8.0)	-8 (10.3)
Slovak Republic	20 (5.3)	13 (3.1)	-7 (5.9)
New Zealand	91 (4.5)	88 (5.0)	-4 (6.7)
Korea	74 (6.9)	71 (6.4)	-3 (9.4)
Austria	32 (7.5)	r 31 (8.6)	-1 (11.4)
Sweden	69 (6.5)	71 (5.9)	2 (7.8)
Slovenia	r 69 (8.8)	r 79 (7.0)	10 (10.6)
Colombia	s 68 (13.5)	s 81 (6.6)	13 (14.9)
Lithuania	73 (6.8)	87 (5.4)	14 (9.3)
Iran, Islamic Rep.	r 19 (6.7)	36 (8.9)	16 (10.8)
Iceland	r 41 (10.7)	61 (10.6)	20 (16.5)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 Index is based on mean frequency of occurrence, as reported by school principals, of the following items: 1) arriving late at school; 2) absenteeism; 3) skipping class; and 4) violating dressing code.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

An "r" indicates response data available for 70-84% of students. An "s" indicates response data available for 50-69% of students.

England, Germany, Hungary, Japan, Norway and Scotland: Question not administered or data not available.

Student Attitudes towards Science and Mathematics

Positive student attitudes towards the subject matter are an important goal of most science and mathematics curricula, both as desirable outcomes in their own right, and because students with positive attitudes are thought more likely to choose further courses in science and mathematics and to seek employment in related fields. The three factors included in this category include:

- student attitudes towards science
- student attitudes towards mathematics
- student belief in the efficacy of science

Student Attitudes towards Science
An index incorporating student responses to questions about their attitude to science was constructed using 14 items from the student questionnaire. Students were asked whether they liked science, and whether they found their science subjects enjoyable or boring. The percentages of students in the high- and low-achieving schools that had a positive attitude towards science are shown in Exhibit 1.31. Among the low-achieving schools, the percentage of students with a positive attitude towards science ranged from a low of 30% in Korea to a high of 84% in both the Russian Federation and Romania, while among the high-achieving schools, it ranged from a low of 37% in Korea to a high of 89% in Romania.

Although in quite a few countries attitudes to science were equally positive in both high- and low-achieving schools, on average a greater percentage of students in the high-achieving schools had a positive attitude towards science. In eleven countries, significantly greater percentages of students in the high-achieving schools reported a positive attitude towards science. The largest differences were found in Belgium (Flemish) and Ireland, where the differences were 20 and 21 percentage points, respectively.

Student Attitudes towards Mathematics
An index of student attitude towards mathematics was constructed by averaging student responses to five questions: (a) I like mathematics, (b) I enjoy mathematics, (c) mathematics is boring, (d) mathematics is important to everyone's life, and (e) I would like a job that involves using mathematics. In general, there was little difference in student attitude between the low-achieving schools and high-achieving schools, with on average about 70% of the students in each group reporting a positive attitude towards mathematics (see Exhibit 1.32). In five countries, Australia, Belgium (Flemish), Hong Kong, Singapore, and Sweden, significantly greater percentages of students in the high-achieving schools reported having a positive attitude towards mathematics.

Student Belief in the Efficacy of Science

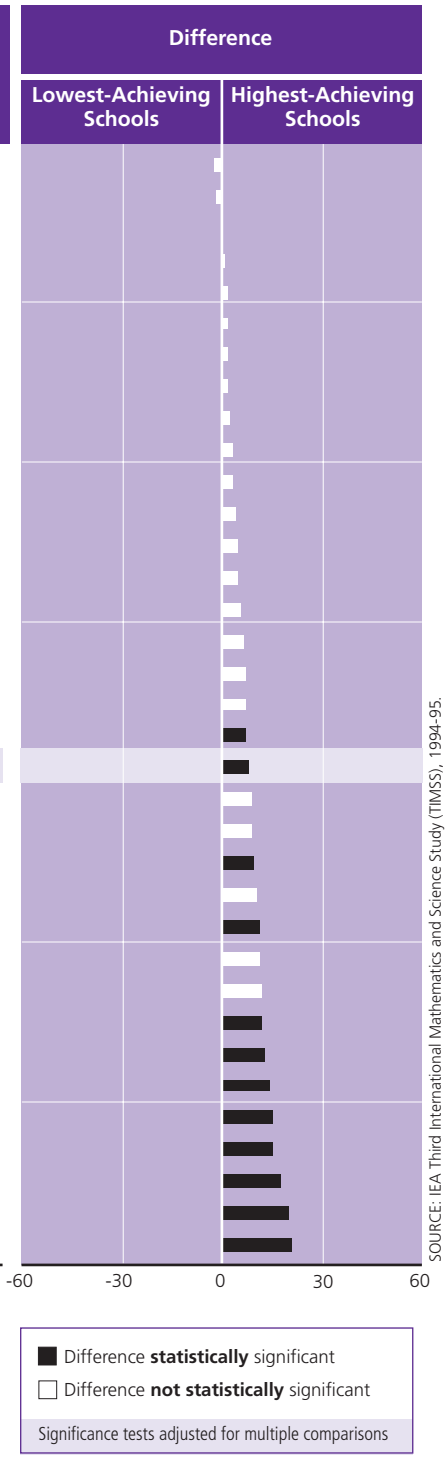
As a further measure of their attitude towards science, TIMSS constructed an index of students' belief in the efficacy of science. The index was based on students' reported beliefs that science could make a contribution to the solution of each of the following problems: air pollution, water pollution, destruction of forests, endangered species, damage to ozone layer, and problems with nuclear power plants.

The percentages of students in the high- and low-achieving schools that reported a belief in the efficacy of science are presented in Exhibit 1.33. On average across countries, greater percentages of students in the high-achieving schools indicated that they thought that science could help solve the world's environmental problems. In ten countries, including Australia, the Czech Republic, Hungary, Iran, New Zealand, Romania, Singapore, the Slovak Republic, Spain, and the United States, students in the high-achieving schools reported greater belief in the efficacy of science. The highest level of belief was expressed by students in the high-achieving schools in the United States (77%), while the lowest level was expressed by students in the low-achieving schools in Iran.

Exhibit 1.31

Percent of Students Having a Positive Attitude Towards Science[1]
Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Slovenia	70 (2.6)	68 (1.9)	-2 (3.2)
Hungary	79 (2.1)	77 (2.0)	-2 (2.9)
Latvia (LSS)	82 (2.1)	82 (2.0)	0 (2.9)
Lithuania	81 (2.2)	82 (2.0)	1 (3.0)
Czech Republic	76 (3.3)	78 (1.9)	1 (3.8)
Slovak Republic	83 (1.8)	84 (1.3)	1 (2.2)
Russian Federation	84 (1.3)	86 (1.3)	2 (1.8)
Netherlands	77 (2.9)	79 (2.3)	2 (3.7)
Iran, Islamic Rep.	69 (2.3)	72 (2.3)	3 (3.3)
Canada	51 (3.7)	53 (1.6)	3 (4.0)
Switzerland	48 (2.6)	51 (2.8)	3 (3.8)
Germany	60 (2.4)	64 (2.3)	4 (3.4)
United States	50 (2.4)	54 (2.8)	5 (3.6)
Romania	84 (1.6)	89 (1.3)	5 (2.0)
Portugal	82 (1.7)	88 (1.3)	6 (2.1)
England	67 (2.4)	74 (2.6)	6 (3.5)
Korea	30 (1.7)	37 (2.7)	7 (3.2)
Austria	41 (2.8)	49 (2.5)	7 (3.7)
Sweden	73 (1.5)	80 (1.8)	8 (2.3)
International Avg.	61 (0.5)	69 (0.4)	8 (0.6)
Cyprus	50 (2.1)	59 (2.2)	9 (3.0)
France	66 (3.8)	76 (2.2)	9 (4.4)
Colombia r	69 (1.9)	79 (2.0)	9 (2.7)
Spain	49 (2.7)	59 (2.5)	10 (3.7)
Singapore	74 (2.6)	85 (1.5)	11 (3.0)
New Zealand	45 (3.1)	56 (2.2)	11 (3.9)
Iceland	60 (4.7)	71 (2.7)	12 (5.4)
Australia	38 (2.0)	50 (2.2)	12 (3.0)
Belgium (Fr)	55 (2.4)	68 (2.3)	13 (3.3)
Japan	35 (2.0)	49 (2.5)	14 (3.2)
Scotland	61 (2.6)	76 (2.4)	15 (3.5)
Norway	47 (2.2)	63 (2.6)	15 (3.4)
Hong Kong	45 (3.0)	63 (2.6)	17 (3.9)
Belgium (Fl)	56 (4.6)	76 (2.2)	20 (5.1)
Ireland	44 (3.0)	65 (2.7)	21 (4.1)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 Index of attitude towards science is based on 14 statements in 3 subindices: 1) I like science (4 statements for 4 science areas); 2) I enjoy learning science (5 statements for 5 science subjects); 3) Science is boring (reversed scale of 5 statements for 5 science subjects). Then the mean of the 3 subindices is calculated to obtain the measure of positive attitude.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

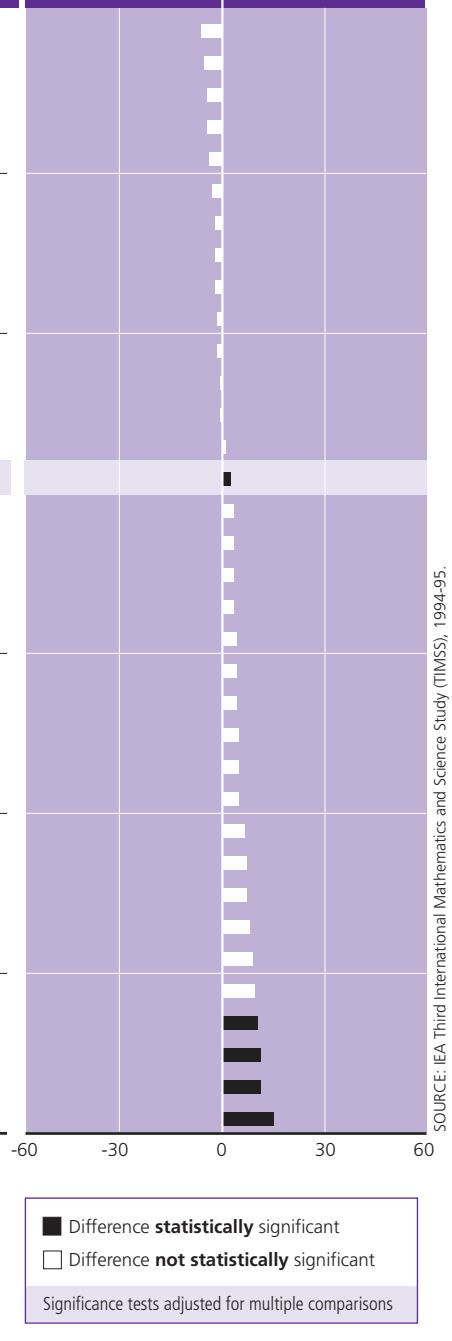
Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

An "r" indicates response data available for 70-84% of students.

Exhibit 1.32

Percent of Students Having a Positive Attitude Towards Mathematics[1]
Schools with the Lowest and Highest Achievement – Eighth Grade* – Mathematics

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Lithuania	64 (3.0)	58 (1.8)	-6 (3.5)
Austria	59 (1.8)	54 (2.2)	-5 (2.8)
Slovenia	68 (2.3)	63 (2.3)	-5 (2.9)
Canada	75 (1.9)	70 (1.5)	-4 (2.4)
Switzerland	71 (1.9)	67 (2.4)	-4 (3.1)
Germany	59 (2.3)	56 (2.1)	-3 (3.1)
Czech Republic	60 (2.7)	58 (2.4)	-2 (3.6)
Colombia	89 (1.4)	87 (2.5)	-2 (2.8)
Spain	65 (2.3)	64 (1.9)	-2 (3.0)
England	83 (1.8)	82 (1.9)	-1 (2.7)
New Zealand	77 (1.8)	77 (1.4)	-1 (2.5)
Latvia (LSS)	70 (2.3)	70 (1.9)	-1 (3.0)
Hungary	60 (2.4)	60 (1.8)	-1 (3.0)
Belgium (Fr)	70 (2.8)	71 (2.1)	2 (3.5)
International Avg.	67 (0.4)	70 (0.3)	3 (0.5)
Norway	67 (1.4)	70 (1.7)	3 (2.1)
Japan	50 (2.1)	53 (1.7)	3 (2.5)
Scotland	74 (2.5)	78 (2.1)	4 (3.2)
Iceland	72 (2.2)	76 (2.5)	4 (3.5)
Ireland	70 (2.4)	74 (2.2)	4 (3.4)
United States	68 (1.6)	73 (1.4)	4 (2.1)
Korea	48 (2.2)	52 (1.5)	4 (2.6)
Iran, Islamic Rep.	80 (2.4)	85 (1.5)	5 (3.0)
Netherlands	55 (4.3)	60 (3.5)	5 (5.5)
Romania	74 (2.5)	79 (2.0)	5 (3.4)
France	65 (2.7)	73 (2.2)	7 (3.4)
Cyprus	76 (2.6)	84 (1.2)	7 (2.9)
Slovak Republic	65 (1.8)	73 (1.7)	8 (2.5)
Russian Federation	71 (2.5)	79 (1.9)	9 (3.3)
Portugal	70 (2.3)	79 (1.9)	9 (3.0)
Singapore	77 (1.8)	87 (1.1)	10 (2.0)
Australia	58 (1.6)	68 (1.5)	10 (2.3)
Hong Kong	60 (2.7)	72 (1.8)	12 (3.2)
Sweden	58 (2.2)	70 (1.7)	12 (2.9)
Belgium (Fl)	56 (2.2)	71 (1.6)	15 (2.8)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 Index of attitude towards mathematics is based on the average of five questions: 1) I like mathematics; 2) I enjoy learning mathematics; 3) Mathematics is boring; 4) Mathematics is important to everyone's life; 5) I would like a job that involved using mathematics.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

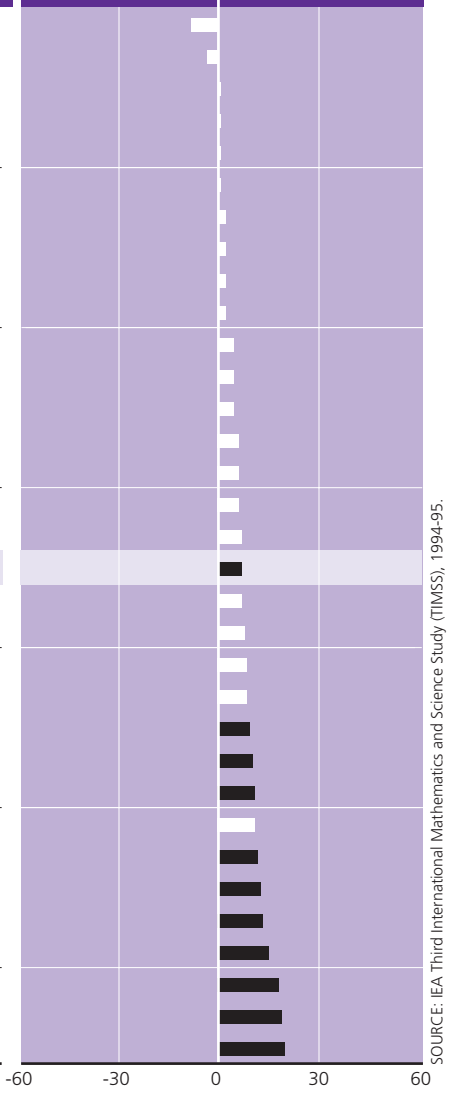
Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

Exhibit 1.33

Percent of Students Believing in the Efficacy of Science[1]

Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Netherlands	39 (3.3)	31 (2.1)	-8 (3.9)
Austria	51 (2.5)	48 (1.8)	-3 (3.1)
Lithuania	46 (2.8)	47 (2.1)	1 (3.6)
Japan	38 (1.7)	39 (1.5)	1 (2.3)
France	36 (2.1)	37 (1.8)	1 (2.8)
Switzerland	46 (1.7)	47 (1.7)	1 (2.4)
Hong Kong	54 (1.6)	56 (1.5)	2 (2.2)
Korea	45 (1.4)	48 (1.5)	3 (2.0)
Canada	57 (1.7)	59 (1.1)	3 (2.0)
Latvia (LSS)	46 (2.0)	49 (2.0)	3 (2.9)
Slovenia	40 (1.9)	45 (1.9)	4 (2.7)
Belgium (Fr)	33 (1.7)	37 (1.7)	5 (2.4)
Germany	43 (2.3)	47 (1.9)	5 (3.0)
Ireland	42 (1.8)	48 (1.9)	6 (2.6)
Russian Federation	42 (1.9)	49 (1.9)	6 (2.7)
Cyprus	27 (1.7)	34 (1.9)	7 (2.6)
Portugal	59 (1.5)	66 (1.8)	7 (2.3)
International Avg.	44 (0.4)	51 (0.3)	7 (0.5)
Sweden	47 (2.0)	54 (1.6)	8 (2.5)
Norway	53 (2.1)	61 (1.6)	8 (2.6)
Iceland	46 (4.1)	55 (1.7)	9 (4.4)
Belgium (Fl)	29 (3.2)	38 (1.6)	9 (3.6)
Hungary	32 (2.0)	41 (2.0)	10 (2.8)
Spain	54 (1.5)	65 (1.6)	10 (2.2)
New Zealand	47 (2.1)	58 (1.7)	11 (2.7)
Colombia r	47 (3.2)	59 (2.9)	11 (4.3)
Slovak Republic	51 (2.2)	62 (1.9)	12 (2.9)
Iran, Islamic Rep.	26 (1.4)	39 (2.5)	13 (2.9)
Czech Republic	38 (2.1)	52 (2.4)	14 (3.2)
Australia	45 (1.4)	61 (1.4)	15 (2.0)
Romania	31 (3.0)	50 (4.1)	18 (5.1)
Singapore	51 (1.9)	70 (1.5)	19 (2.5)
United States	57 (1.3)	77 (1.1)	20 (1.7)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 Index is based on percent of students responding that Science can help "Somewhat" or "A great deal" in addressing all six of the following environmental problems: 1) air pollution; 2) water pollution; 3) destruction of forests; 4) endangered species; 5) damage to the ozone layer; 6) problems from nuclear power plants.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

England and Scotland: Question not administered or data not internationally comparable.

An "r" indicates response data available for 70-84% of students.

Instructional Activities in Science and Mathematics Class

Of the many instructional activities in mathematics and science that TIMSS asked about, the two most strongly related to student achievement were the reported frequency of doing experiments or practical investigations in science class, and the frequency with which mathematics teachers checked homework in class.

Students Doing Science Experiments

Although large classes and scarcity of resources can limit what can be implemented, many science educators today stress the desirability of teaching science as a discovery activity, with great emphasis on students carrying out experiments and practical investigations. Exhibit 1.34 presents the percentages of students in high- and low-achieving schools in each country that reported doing such activities often in science class. It is clear from this exhibit that although there are countries where many "hands-on" activities take place – for example England, Scotland, and Sweden, where more than 80% of students in both groups of schools reported doing experiments often – in many countries practical work in science class is relatively rare. In Austria, Belgium (French), Hungary, Iran, Korea, and Spain, less than 40% of students in either group of schools reported conducting practical work often in science class. These differences suggest that the way science is taught in the classroom varies considerably around the world. Apart from the two extremes noted above – countries where everybody does a lot of practical work in science classes and countries were nobody does a lot – there were countries such as Australia, France, Hong Kong, Netherlands, New Zealand, Scotland, and Singapore, where doing experiments or practical work often was more frequently reported by students in the high-achieving schools.

Teacher Frequently Checks Mathematics Homework in Class

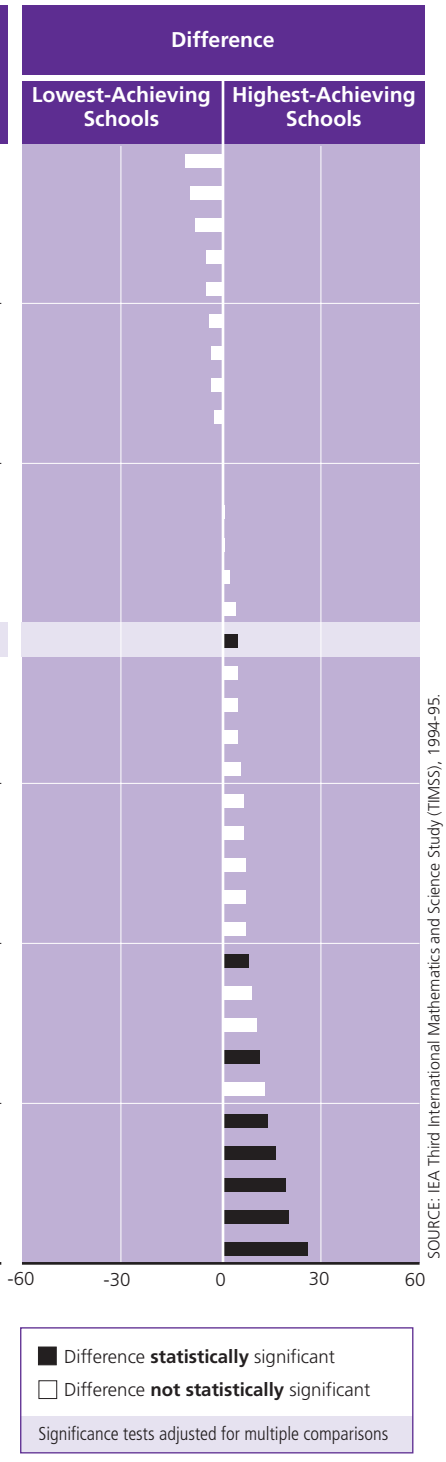
The practice of giving homework and subsequently checking it in class was reported to be widespread. In eight countries, Austria, Belgium (Flemish), the Czech Republic, England, Ireland, Latvia(LSS), Scotland and Singapore, more than 80% of students in both high- and low-achieving schools reported that the teacher always or almost always checks homework in mathematics class. Only in Japan and Korea, two of the countries with the highest average achievement, did less than half of the students in both groups of schools report that the mathematics teacher usually checks homework. In several countries, including the Netherlands, Australia, Switzerland, and the United States, the practice of checking homework in mathematics class was more frequently reported by students of low-achieving schools (see Exhibit 1.35).

Exhibit 1.34

Percent of Students Frequently Doing Experiments or Practical Investigations in Class[1]

Schools with the Lowest and Highest Achievement – Eighth Grade* – Science

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Lithuania	52 (3.3)	42 (2.9)	-10 (4.4)
Iran, Islamic Rep.	39 (2.5)	29 (2.8)	-9 (3.7)
Cyprus	41 (1.8)	34 (1.7)	-8 (2.5)
Colombia	r 50 (3.3)	46 (3.9)	-4 (5.1)
Austria	30 (2.6)	26 (3.3)	-4 (4.2)
Spain	25 (2.9)	21 (2.3)	-4 (3.7)
Romania	75 (2.6)	72 (3.3)	-3 (4.2)
Hungary	36 (2.8)	34 (3.0)	-2 (4.1)
Belgium (Fl)	58 (2.8)	57 (4.1)	-2 (5.0)
Iceland	67 (3.5)	67 (8.2)	0 (8.9)
Germany	55 (2.8)	55 (3.6)	0 (4.5)
Belgium (Fr)	38 (2.6)	39 (3.7)	1 (4.5)
Slovak Republic	46 (2.0)	47 (2.7)	1 (3.3)
Slovenia	44 (2.8)	47 (3.5)	3 (4.5)
England	89 (1.4)	94 (1.1)	4 (1.8)
International Avg.	56 (0.5)	61 (0.5)	5 (0.8)
Korea	32 (3.4)	37 (2.5)	5 (4.2)
Norway	63 (4.0)	68 (3.7)	5 (5.5)
Czech Republic	48 (3.3)	53 (3.6)	5 (4.8)
Sweden	88 (1.9)	94 (0.9)	6 (2.1)
Russian Federation	57 (2.1)	63 (2.4)	6 (3.2)
Latvia (LSS)	65 (3.7)	72 (2.6)	7 (4.5)
Portugal	40 (2.8)	47 (2.4)	7 (3.7)
United States	59 (2.3)	66 (3.1)	7 (3.9)
Japan	72 (3.6)	80 (1.7)	8 (4.0)
Scotland	82 (1.7)	90 (1.2)	8 (2.0)
Ireland	r 55 (4.3)	64 (4.9)	9 (6.6)
Canada	62 (4.7)	72 (2.4)	10 (5.2)
Singapore	77 (2.7)	89 (1.3)	12 (3.0)
Switzerland	r 31 (3.0)	44 (3.4)	13 (4.5)
Australia	70 (2.9)	84 (1.7)	14 (3.3)
New Zealand	72 (2.2)	88 (2.1)	16 (3.0)
France	66 (4.3)	86 (2.1)	20 (4.7)
Hong Kong	74 (3.4)	94 (1.1)	20 (3.5)
Netherlands	41 (4.2)	66 (4.0)	26 (5.8)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 Index is based on the percentage of students who report that thay "Almost always" or "Pretty often" do experiments or practical investigations in at least one of the following 5 science lessons: 1) science (integrated) lessons; 2) biology lessons; 3) chemistry lessons; 4) earth science lessions; 5) physics lessons.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

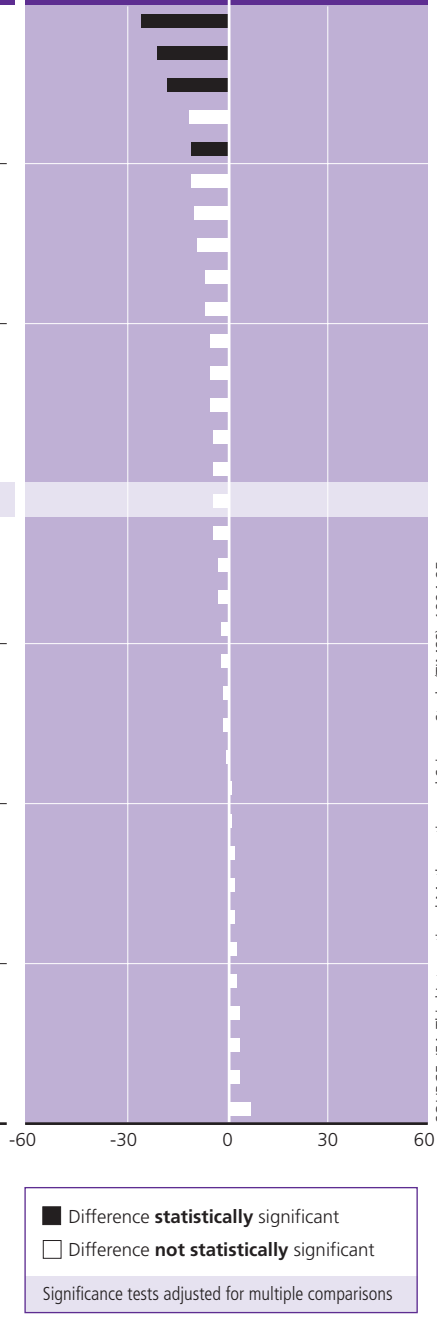
An "r" indicates response data available for 70-84% of students.

Exhibit 1.35

Percent of Students in Mathematics Classrooms Where the Teacher Frequently Checks Homework During Lessons[1]

Schools with the Lowest and Highest Achievement – Eighth Grade* – Mathematics

Country	Lowest-Achieving Third of Schools	Highest-Achieving Third of Schools	Difference Between Highest and Lowest Schools
Netherlands	52 (5.0)	26 (4.3)	-26 (6.6)
Australia	57 (2.8)	36 (2.8)	-21 (3.5)
Switzerland	73 (3.3)	55 (2.8)	-18 (4.3)
Germany	73 (2.4)	62 (3.2)	-12 (4.2)
United States	82 (1.4)	72 (3.1)	-11 (2.9)
Spain	68 (3.1)	57 (3.6)	-11 (4.9)
Slovak Republic	66 (3.5)	56 (5.0)	-10 (6.1)
Austria	93 (1.3)	84 (3.5)	-9 (3.7)
Norway	69 (3.4)	62 (4.1)	-7 (5.1)
Japan	42 (4.9)	35 (3.0)	-7 (5.6)
Iceland	59 (4.6)	54 (7.4)	-5 (8.8)
Colombia r	75 (3.5)	70 (3.2)	-5 (4.6)
Lithuania	62 (3.8)	57 (4.0)	-5 (5.3)
Romania	62 (3.1)	58 (3.3)	-4 (4.5)
Latvia (LSS)	94 (1.3)	90 (1.6)	-4 (1.9)
International Avg.	71 (0.6)	67 (0.6)	-4 (0.8)
Czech Republic	88 (2.5)	84 (4.6)	-4 (5.3)
Scotland	84 (2.7)	81 (3.8)	-3 (4.6)
Hungary	70 (2.8)	68 (3.2)	-2 (4.0)
Russian Federation	74 (2.9)	73 (3.8)	-2 (4.9)
Sweden	74 (3.1)	72 (4.2)	-2 (4.9)
Cyprus	74 (2.6)	72 (3.1)	-1 (4.0)
Ireland	84 (3.0)	83 (2.2)	-1 (3.7)
France	57 (3.6)	57 (3.9)	-1 (5.5)
Korea	44 (3.3)	45 (3.8)	1 (4.9)
Slovenia	58 (4.5)	59 (4.1)	1 (5.8)
England	85 (2.0)	86 (2.2)	2 (3.0)
Hong Kong	72 (3.8)	74 (3.3)	2 (5.0)
Portugal	73 (3.0)	75 (3.1)	2 (4.4)
Iran, Islamic Rep.	72 (3.3)	75 (3.4)	3 (4.7)
Canada	60 (3.6)	63 (2.4)	3 (4.7)
New Zealand	72 (2.6)	76 (3.8)	4 (4.7)
Singapore	91 (1.7)	94 (0.7)	4 (1.8)
Belgium (Fl)	84 (2.9)	88 (2.6)	4 (3.9)
Belgium (Fr)	61 (4.0)	67 (3.0)	7 (5.0)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 Percent of students reporting that the teacher "Always" or "Almost always" checks homework in class.

* Eighth grade in most countries; see Exhibit 1 for information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some differences may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Exhibit A.1). Because coverage falls below 65%, Latvia is annoted LSS for Latvian Speaking Schools only.

An "r" indicates response data available for 70-84% of students.

Summary

The contrast between the highest- and lowest-achieving schools in science and mathematics in each country points to a number of factors that distinguish between the two groups of schools. Most prominent of these, and most consistent across countries, were the home background indicators of socioeconomic status and of parental support for academic achievement. In almost all countries, students in the high-achieving schools had higher levels of book ownership, study aids, possessions in the home, and parental education, and spent less time working in the home. Another distinguishing factor related to the home was student aspirations for higher education. In most countries, plans to attend university after secondary school were much more frequently reported by students in the high-achieving schools. In this regard, the TIMSS results support earlier studies that found a close relationship between the composition of the student body and student achievement.

Unlike student background, factors more directly related to the school were less uniformly effective in distinguishing between the high- and low-achieving schools. Although school size and location, school social climate, students' attitude to science and mathematics, and instructional activities in science and mathematics class did discriminate between the high- and low-achieving schools in various countries, few school variables worked consistently across all countries. This indicates that analyses of characteristics of effective schools are likely to involve different variables in different countries, or groups of countries, rather than common variables that operate in the same way across all countries.

The next chapter in this report provides a start to the examination of characteristics of effective schools in the TIMSS data. For the countries with large differences between the average achievement levels of their schools, a series of analyses were conducted that explored the influence of a range of school, teacher, class, and student variables on student achievement in science and mathematics, while controlling statistically for differences between schools in student home background.