

Danish Technological Institute: Explaining Student Performance

November 2005 (Grafiken und Auszüge aus der Originalstudie)

Recommendation:

- *Tracking systems and other forms of differentiation of students into separate streams are used widely in the Netherlands, Austria, Germany, Belgium, Luxembourg, Hungary, and the Czech Republic and Slovakia. Policy makers in these countries should consider whether there are unrealized potentials in developing education systems towards more comprehensive systems with a lower degree of institutional differentiation among students.*

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Table 4.8: Variance Between and Within Schools, Mathematics Scale, PISA 2003.

	Total variance in SP between schools	Total variance in SP within schools	Total variance in Student Performance	Mean Mathematics Score
Iceland	3,6	90,9	94,5	515
Finland	3,9	77,3	81,2	544
Norway	6,5	91,7	98,1	495
Sweden	10,9	92,8	103,3	509
Poland	12,0	83,1	94,7	490
Denmark	13,1	84,2	96,5	514
Ireland	13,4	71,2	83,9	503
Spain	17,2	70,2	90,8	485
Latvia	20,6	71,0	90,2	483
United States	27,1	78,3	104,9	483
Portugal	30,3	60,0	89,0	466
Luxembourg	31,2	67,6	98,1	493
Greece	38,9	68,1	101,8	445
Slovakia	41,5	58,0	98,7	498
Korea	42,0	58,2	99,3	542
Czech Republic	50,5	55,2	99,9	516
HK China	52,8	60,4	115,7	550
Netherlands	54,5	39,5	91,9	538
Austria	55,5	49,5	98,4	506
Germany	56,4	52,6	108,3	503
Italy	56,8	52,0	106,5	466
Belgium	56,9	66,7	121,8	529
Japan	62,1	55,0	116,3	534
Hungary	66,0	47,3	101,5	490
Turkey	68,7	56,5	127,4	423

Source: PISA 2003 dataset and OECD 2004c.

Total variance in student performance is expressed as a percentage of the average variance in student performance across OECD countries. The sum of the between- and within-school variance components, as an estimate from a sample, does not necessarily add up to the total.

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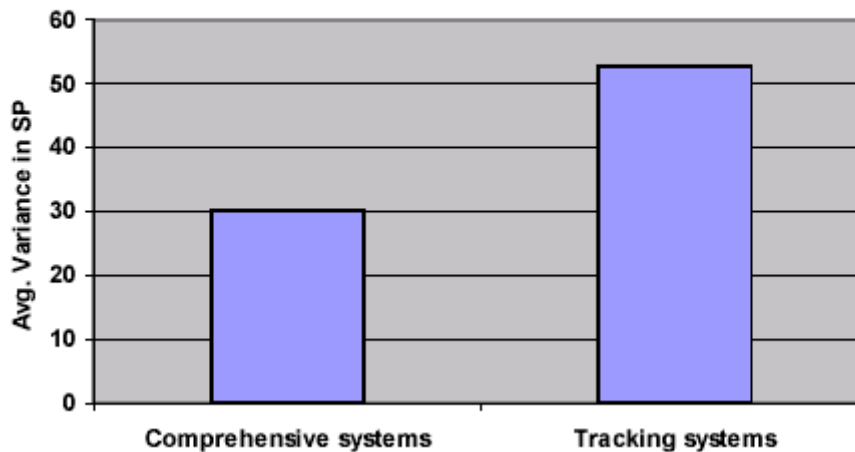
Box 4.5 The Principle of Equity in the Nordic Education Systems

It is characteristic of the Nordic education systems that they rest on a long-standing principle of equity. Providing all students with equal access to education and removing obstacles to learning, especially among students from a disadvantaged background, have been leading objectives in Nordic education policy. The Nordic strategy for building up both high quality and equality in education has been based on constructing a publicly funded comprehensive school system without selecting, tracking, or streaming students during basic education until the age of 16. Part of the strategy is to spread the school network so that pupils have a school near their homes whenever possible. Inclusion of special education and instructional efforts to minimize low achievement are also typical to Nordic educational systems.

Sources: Lie et al. 2003, Husén 1974.

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Figure 4.4. Average Variance in Student Performance Between Schools, Comprehensive School Systems and Tracking Systems, PISA 2003 Mathematics Scale.



Tracking Systems and Between-School Variance

It could be expected that variance between schools would be larger in educational systems with early tracking of students than in comprehensive school systems. This could be the case to the extent that tracking systems entail a concentration of students with similar performance scores in specific schools..

Figure 4.4 illustrates that this relation can be found. The average between-school variance is larger (almost 56) in countries with a tracking system (Austria, Belgium (Flemish and French communities), the Czech Republic, Germany, Slovakia, and the Netherlands) than in countries with a comprehensive school system (average between-school variance almost 32).¹⁵

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Table 4.9: Share of Students Performing at Level 1 and Lower in Reading, PISA 2003.

	% Below Level 1 (Below 335 Score Points)	% Level 1 (335 to 407 Score Points)	% at Level 1 and Lower (Below 407 Score Points)
Finland	1,1	4,6	5,7
Korea	1,4	5,4	6,8
Ireland	2,7	8,3	11,0
Netherlands	2,1	9,4	11,5
HK China	3,4	8,6	12,0
Sweden	3,9	9,4	13,3
Denmark	4,6	11,9	16,5
Poland	5,3	11,5	16,8
France	6,3	11,2	17,5
Belgium	7,8	10,0	17,8
Latvia	5,0	13,0	18,0
Norway	6,4	11,8	18,2
Iceland	6,7	11,8	18,5
Japan	7,4	11,6	19,0
Czech Republic	6,5	12,9	19,4
United States	6,5	12,9	19,4
EU average	6,2	11,9	18,1
Hungary	6,1	14,4	20,5
Austria	7,3	13,4	20,7
Spain	7,4	13,7	21,1
Portugal	7,6	14,4	22,0
Germany	9,3	13,0	22,3
Italy	9,1	14,8	23,9
Slovakia	8,0	16,9	24,9
Greece	10,2	15,0	25,2
Turkey	12,5	24,3	36,8

Source: PISA 2003 dataset.

At the same time it is notable that one country that performs relatively well as regards the average reading score, namely Germany with an average reading score around the overall average, has a relatively high share of students performing at level 1 or lower in reading. Belgium is another country where the share of low-performing students in reading is relatively high compared to the average score of the country's students in reading. These results reflect well the results concerning the variation of average reading scores: As noted above, Belgium and Germany are the two countries with the highest standard variation on the mean reading score in PISA 2003.

Table 4.10: Development in Shares of Students Performing at Level 1 and Lower in Reading, PISA 2000-2003. Development in Percentage Points.

	Trend Below Level 1 (Below 335 Score Points)	Trend Level 1 (335 to 407 Score Points)
Latvia	-7,7	-4,9
Poland	-3,4	-3,1
Portugal	-2	-2,3
Hungary	-0,8	-1,4
Belgium	0,1	-1,3
Greece	1,5	-0,7
Finland	-0,6	-0,6
Denmark	-1,3	-0,1
Sweden	0,6	0,1
France	2,1	0,2
Germany	-0,6	0,3
Ireland	-0,4	0,4
Korea	0,5	0,6
Norway	0,1	0,6
Iceland	2,7	1,3
Italy	3,7	1,3
United States	0,1	1,4
Czech Republic	0,4	1,5
Spain	3,3	1,5
HK China	0,8	2,1
Austria	2,9	3,2
Japan	4,7	4,3

Source: PISA 2003 and 2000 datasets. Bold: Differences are statistically significant, cf. footnote 11.

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Box 4.6

Reforms in Finland: Focusing on Equal Educational Opportunities

The results of both the PISA 2000 and PISA 2003 surveys identify Finland as a top-performing country. This is so both as regards the average pupil achievement scores and as regards the variance in pupils' achievement scores.

In Finland, reforms over three decades have revolved around the desire to promote equal educational opportunities. Efforts have included the introduction of comprehensive schools in the 1970s to replace a tracked school system, the reform of vocational training in the 1980s, and the establishment of polytechnics in the 1990s. With comprehensive education came greater central planning and control, particularly over the curriculum. However, during the 1990s, schools were given more freedom over optional subjects and were allowed greater diversity through concepts such as specialized schools.

The Finnish strategy for building up high quality has been based on the principle of equity and on an effort to minimize low achievement. The principle of equity has a geographical dimension, as all students irrespective of their place of residence are to be provided with equal opportunities for high quality education. A comprehensive network of schools and the recruitment of highly qualified teachers in all schools have been important means in ensuring educational equality in all regions of Finland. There are over 4,000 comprehensive schools, about 750 upper secondary schools (academic and vocational), 20 universities, and a large number of other educational institutes, for a country of slightly over 5 million inhabitants. In comparison, there are in total only about 2,100 public and private primary and lower secondary schools in Denmark, a country of roughly the same population.

Sources: Freymann 2001; Koivula 2005; Linnakylä & Välijärvi 2003; OECD 2004b.

Table 5.1. Difference in Average Score between Native Students and Students with Foreign Background, PISA 2003.

	Average Difference	Reading	Science	Math	Pct. Students with Foreign Background
Belgium	99	99	98	100	12
Germany	90	91	99	81	15
Austria	71	76	76	61	13
Sweden	66	55	79	64	12
Norway	65	64	80	52	6
Netherlands	65	54	75	66	11
Denmark	64	50	73	68	7
France	58	55	64	54	14
Luxembourg	48	58	48	38	33
Greece	44	44	45	43	7
USA	32	34	34	28	14
HK China	9	4	10	12	43
Latvia	4	10	-1	3	9
Portugal	50	45	44	61	5
Ireland	7	12	6	4	4
Spain	48	45	54	45	3

Source: PISA dataset 2003.

Due to an insufficient number of observations to provide reliable estimates, data for countries with very low shares of students with foreign background has been omitted.

To calculate the EU average, data for at least 15 of the EU 25, representing at least 60 per cent of the total EU population must be present. Since data only covers 13 of the EU 25 countries, the average is not calculated for the table.

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How do students with a foreign background perform in the PISA tests, compared to native students? There is a considerable variance between countries. As regards the group of countries with more than 5 per cent students with a foreign background, Belgium and Germany stand out. In these two countries, the differences in the average achievement score between native students and students with foreign background are larger than in other countries, to the disadvantage of the students with foreign background. The differences in Sweden, Norway, the Netherlands, Denmark, and France, are at a lower level but still high. The differences in the USA are at a relatively lower level although the share of foreign

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