
This article is based on a verbal presentation given to the Quality of Childhood Group in the European Parliament in January 2010 and hosted by MEP Evelyn Regner. Notes were taken during the presentation and formulated into the article below. Professor Dr. Andreas Schleicher did not have the opportunity to comment on the edited text.

The Quality of Childhood, Evidence from the Programme for International Student Assessment (PISA)

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SUMMARY

The OECD's Programme for International Student Assessment (commonly known as the PISA study) provides a rich source of data, not only about the PISA test outcomes, but also about many other aspects of children's lives. For example, a child's socio-economic background, upward mobility, the contexts within which the schools operate, the objectives set for them, how students feel about school, and so on. The objective of the PISA Study is that the PISA team wishes to gain an insight into to what extent young people are being prepared to be successful in adult life.

Andreas Schleicher drew our attention to the fact that a good PISA score of a country in many ways goes hand in hand with a good quality of childhood, and a lower PISA score with a poor quality of childhood.

Andreas Schleicher did not speak about how students could achieve higher PISA scores. Instead he spoke about the contexts in which schools operate, and the characteristics of the best educational systems.

The main points of his presentation are as follows:

The contexts in which schools operate are complex and characterised by tensions and paradoxes;

- 1. The autonomy of schools versus centralized control.*
- 2. Do schools address the individual needs of students or the needs of the student body as a whole?*
- 3. The general public wants the school to play a pedagogical role with regards to the children, but at the end of the day the school is judged on the basis of cognitive knowledge scores.*
- 4. Strong opinions in society go hand in hand with widespread ignorance regarding children and education.*

The first challenge for an educational system is to create a context for schools in which they can function in an optimal way.

The perception or understanding of what constitutes a good school is of decisive importance to how a school system is set up and managed

The perception of what constitutes a good school is changing all the time.

- The objective of the school in the Middle Ages: to transmit knowledge to those people who could afford education.
- At the time of the Industrial Revolution the objective shifted to making people compatible with the machines they had to operate.
- Today the challenge has shifted again: the challenge now is to produce motivated citizens who have the capacity and motivation to continue learning throughout their lives. Computers have entered schools, but other than this the model of education has not changed very much.

Each Ministry of Education should ask itself to what extent it still has an educational approach that came into being during the Industrial Revolution, and has it developed a "Weltanschauung" that matches the current situation?

The OECD Team studied what skills are required today and compared this with what is taught by schools.

The following skill categories are identified for the U.S.A situation:

- Routine manual is work that is done by hand, every day in the same way. These jobs can now be done by machines.
- Non-routine manual is work done by hand, but takes knowledge, skill and experience to do. There is always a need for people able to do this kind of work. For example: a plumber, an electrician, etc.
- Routine cognitive, the typical white collar middle class administrative jobs. These are in steep decline.
- Non-routine analytic, the demand for this type of work is rising fast.
- Non-routine interactive, the demand for this type of work is growing even faster.

The conclusions of the PISA team:

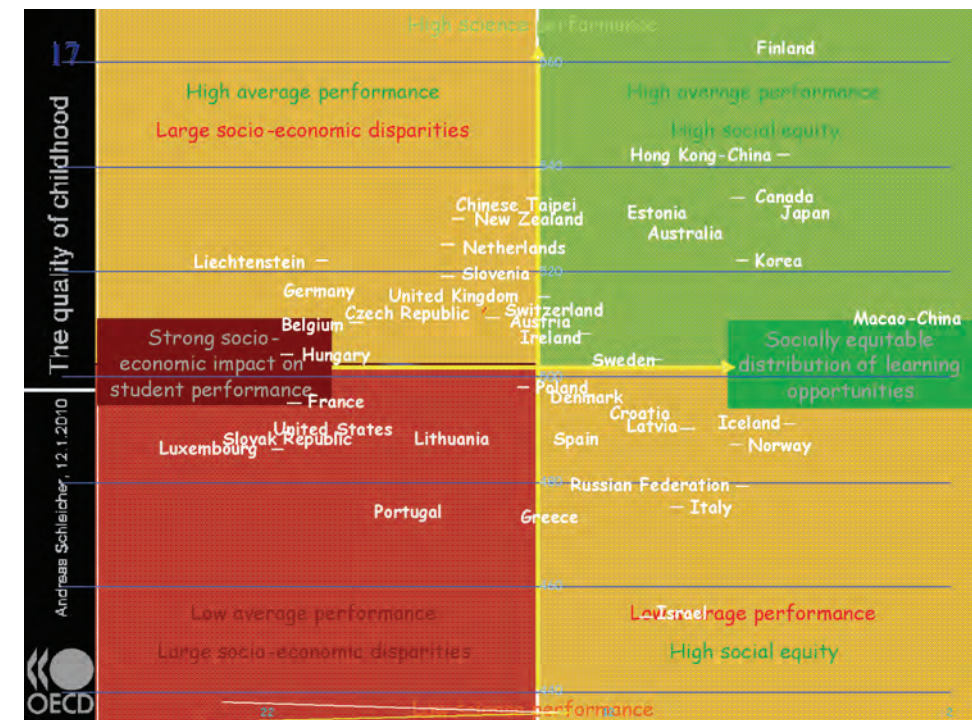
- The schools are thus faced with a dilemma: the skills that are easiest to teach and to test, i.e. the 'routine cognitive skills' are easiest to digitise, automate and outsource. The skills for which there is a growing demand such as the 'non-routine analytic skills' and the 'non-routine interactive skills' are more difficult to teach and cost more money to do so.
- We have a clear picture of what will make young people successful in modern society. We know about the great importance of interpersonal skills such as the ability to cooperate with others and to orchestrate projects in complex situations. In addition, in order to be successful, young people must be able to position themselves in this complex world and, at the same time, to change this position continuously. Some young people find this very difficult.
- Conventionally we taught our children to break a problem down into smaller and smaller pieces and to solve each of these pieces. But knowledge creation today is based on synthesizing different fields of knowledge. It is about applying knowledge in a field that

nobody else has dealt with before and relating that knowledge to what other people know. This involves relating knowledge from one area across different areas of knowledge. For schools the term is 'cross curricular competences'.

- PISA is strong on testing the 'non-routine analytic' skills, but is less strong regarding the testing of 'non-routine interactive skills'.

The equity of the offering of learning opportunities has an important impact on PISA scores

The OECD team has created a grid of the PISA scores for science on the one hand (y-axis) and the measure of socially equitable distribution of learning opportunities on the other hand (see diagram below)



In the countries on the left hand side of the diagram the educational system replicates the social differences in society. In the countries on the right hand side: the educational system helps students with a weaker socio-economic background to succeed. This is brought about by the following:

- a high degree of individualization of the education offered to the students with a tailor-made approach for each child.
- there is a good support system for weaker students. They receive extra help to enable them to catch up.
- Andreas Schleicher closed his talk with the following remark: 'Quality and equity are therefore not only the most critical issues for the quality of childhood, but also for all chances in life'.

What are the characteristics of the best school systems?

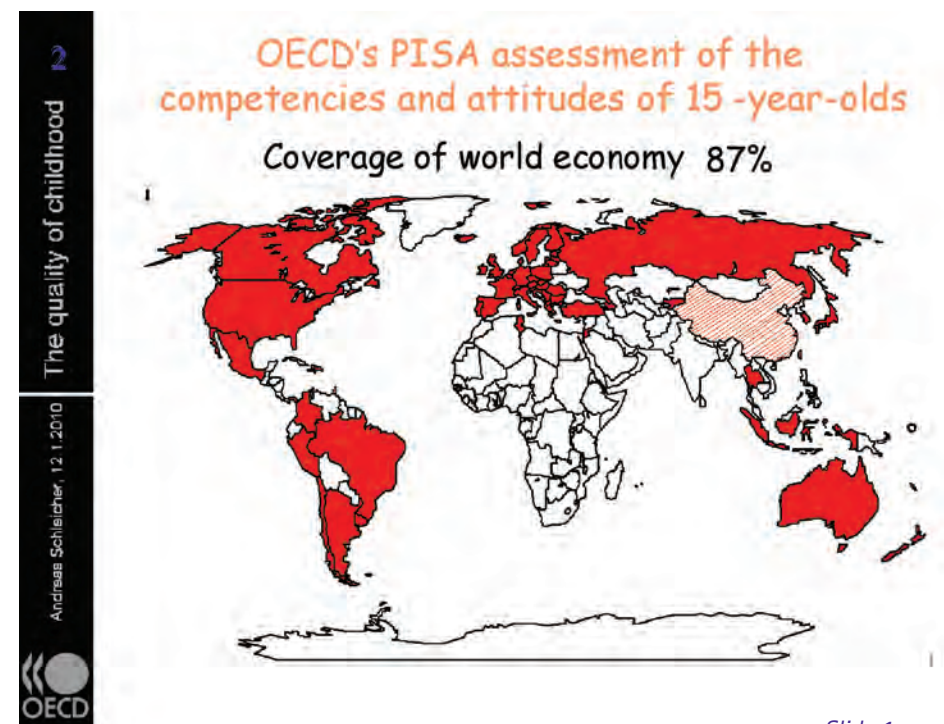
- *High expectations and a strong culture of support provide the best results.*
What we have learned about successful school systems in terms of quality and equity is that the level of expectation in terms of the perception of the students and of the teachers is a very important determinant for success, if it is combined with a culture of support.
- *A high autonomy of the individual schools, while they are at the same time strongly connected with each other in a network structure*
- *Public schools can be as good or better than private schools*
- *Educational systems that have a low degree of stratification, have well integrated pathways and which are highly personalized are the most successful.*
- *They are knowledge rich and the teachers and the teams in which they function are characterised by a high degree of professional judgment.*

INTRODUCTION

What is the PISA Study?

The OECD's PISA Study is a comprehensive and rigorous international performance assessment programme, which assesses the performance of students of fifteen years of age in 55 countries in three subject areas: the native language of the student, mathematics and science. The PISA Study not only offers deep insights into the academic performance of students in each participating country, but also provides data about the characteristics of the students themselves, their families and the country's educational system. In this way, a wealth of knowledge about what works and what does not is currently available to educational policy makers, civil society organisations and the public at large. The OECD launched the PISA Programme in 1997 and the first survey, which focussed on literacy, was carried out in 2000. The second survey focussed on mathematics and was conducted in 2003, and the third survey in 2006 centred on science. The PISA Study is a joint exercise carried out by all the countries that are part of the study. The unit at the OECD that is responsible for the survey consists of a team of only five people. Most of the work takes place in the participating countries.

The following slide illustrates the spread of countries participating in the PISA Study. The list of countries has grown over the time. The last two countries to join the programme were China and India.



Slide 1

The context in which schools operate is complex and is characterised by tensions and paradoxes

Let me describe the environment in which the PISA survey is being carried out. The PISA study is conducted in schools and these schools are an integral part of the educational system of the country in question. In many countries the schools are pushed in two opposing directions, and this happens on various different levels.

1. Tensions and Paradoxes: The Autonomy of schools versus Control

On the one hand there is a drive to give schools **more autonomy** with:

- a greater discretion for schools to establish the learning environment and to manage their own resources
- to strengthen the schools as dynamic organisations with powerful identities and their own ethos
- the schools are expected to be innovative and flexible learning organisations.

On the other hand there is a drive to **increase control**:

- because Ministries of Education are afraid of criticism, are concerned about schools that do not attain the standards set for them, or the Ministries are held to account with regard to what happens in the schools.
- the Ministries put pressure on schools to conform to precise, standardised outcomes, and to manage and contain risk.

How can a school be innovative and flexible when, at the same time, the Ministry of Education wishes to control all the procedures and to contain all the risks?

Tensions and Paradoxes: Individual Approach of Students versus Collective Aspirations

Another tension and paradox of the school environment is the approach that a school takes to what they offer to students. Do they

- follow an individual approach? Or, alternatively,
- do they follow the collective aspirations?

When a country chooses to follow an individual approach then the following elements come to the fore:

- individual learning takes place, which increases the complexity of the pathways;
- a logical consequence of this is individual assessment and certification;
- another consequence is a diversification of the education providers and provision.

The school system can have collective aspirations for the following reasons:

- learning takes place through interaction;
- success in the world of work depends more and more on interpersonal competencies, but teaching these competencies is not a part of the official curriculum, and they are also not part of the testing system.
- for Ministries of Education it is important to secure equality of opportunity for students.

Tensions and Paradoxes: the general public wants the school to play a pedagogical role with regards to children, but at the end of the day the school is judged on the basis of cognitive knowledge scores.

There are growing expectations on schools that extend far beyond cognitive learning, but the terms on which schools are judged are increasingly focused on their success in the teaching and transmission of cognitive knowledge.

Tensions and Paradoxes: Strong Opinions in society go hand in hand with widespread ignorance

Many people in society have strong opinions about the school system. This is combined with widespread ignorance about schools and education.

With regard to the strong opinions held by the public:

- people can have positive views of educational experiences on the personal or local level,
- and they can have many views about what takes place in the classroom based on their own idiosyncratic experiences.

There is widespread ignorance about schools and education:

- there are negative opinions about the state of education in general on the basis of limited knowledge;

- there is limited transparency with regard to educational goals and processes.

Conclusion:

The first challenge for an educational system is to bring into being a context for schools in which schools can function in an optimal way.

What is the Goal of the PISA Study?

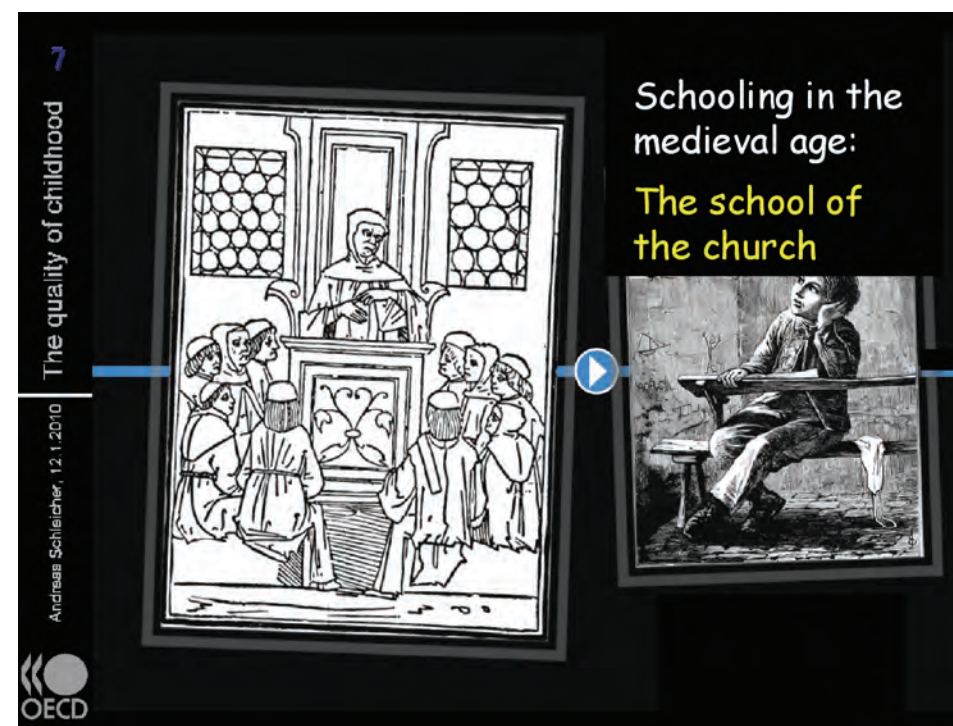
One of the principle questions that has to be answered when starting an evaluation such as the PISA Study is the question of the goal of the study. We asked: "What should education be about?" The answer to this question does not only depend on what can be measured, but also on what is intended to be measured. When starting the PISA process in the OECD it was not intended to measure what students can reproduce from what they have learned in school. This had already been done. We wanted to get an idea of to what extent young people are prepared to be successful in their future lives.

The picture that is held of what constitutes a good school is of decisive importance to how a school system is set up and managed

The picture or "Weltanschauung" that people hold of what constitutes a good school is changing all the time.

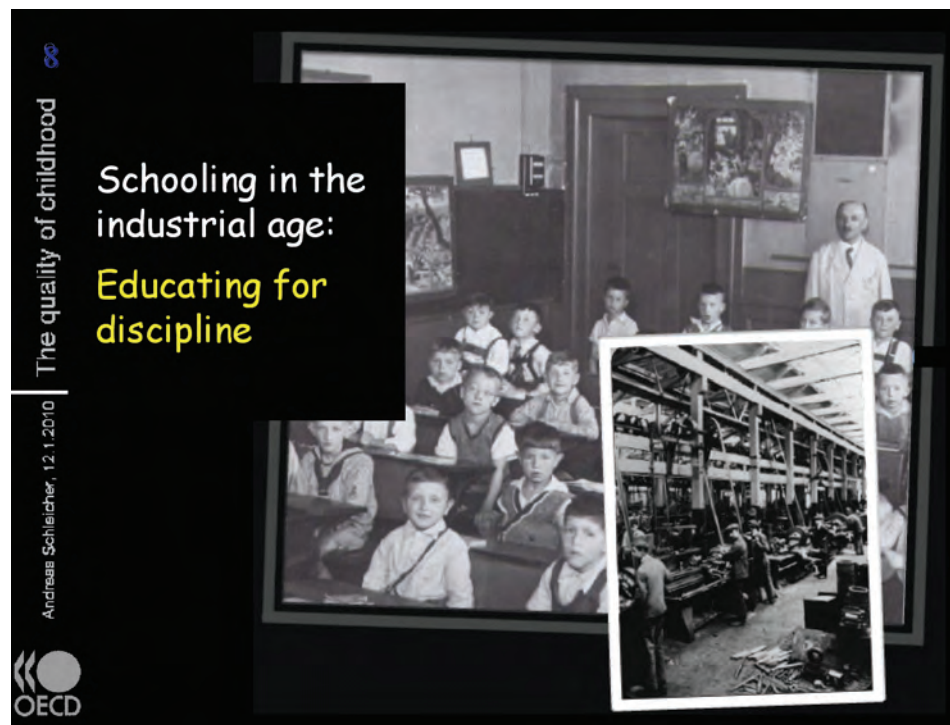
The objective of the school in the Middle Ages:

When schooling was invented it was rather easy. There was one truth and that was transmitted to the people who could afford education.



At the time of the Industrial Revolution the objectives shifted to making people compatible with the machines they had to operate:

When the industrial revolution occurred schooling was also rather straightforward. The goal of school was essentially to make people compatible with industrial norms and to train them to operate the machines in an efficient way. People had to be able to function, to understand basic literacy and to be disciplined in a world that was determined by outside processes. Discipline was, and still is, the organising idea. When schooling was invented there was a clear reason for this: the need to divide people into different groups. There was the need for a few people to be highly educated and a lot of people to be in the middle. Tolerance towards people with very few competences was not a problem. Everybody would find a place to work.



Slide 3

The challenge today has shifted again:

When times changed, things became more complicated and production processes more advanced. Industrialized societies tried to imitate these processes in schools: computers entered schools, but other than this the model of education has not changed very much.



Slide 4

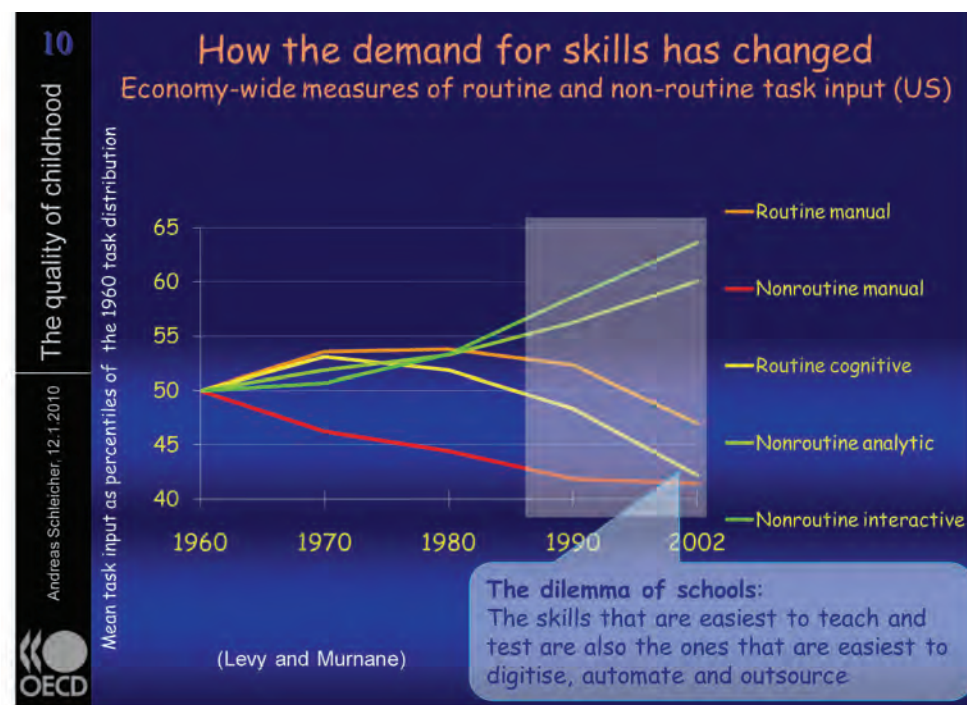
But the challenge today is to produce motivated citizens who have the capacity and motivation to continue learning throughout their lives. Children do not learn much in school about what has happened over the last fifty years. That becomes a serious problem when we take, for example, the subject of science. Half of the knowledge about science that people need in their lives is not learned at school. So the question arises, what should be taught in science lessons, when the content of this subject is changing so quickly? There are, for example, many new professions emerging. There is very good data about this in the U.S.A: The ten professions most in demand in 2009 did not even exist in 2003.

The OECD Team studied what skills are required today and compared this with what is offered by schools

I would like to present the results of the work done by Levy and Murnane regarding the development of the demand for skills in the U.S.A. Levy and Murnane have classified all work in the U.S.A into five main categories:

- **Routine manual**, (the orange line in the graph on the next page) which they describe as work that is done by hand, every day in the same way. Those jobs can now be done by machines, as you can see by the declining numbers of people doing this kind of work.
- **Non-routine manual**, is work done by hand, but which takes knowledge, skill and experience, such as the work of a plumber or an electrician. There is always a need for people able to do this kind of work.

- **Routine cognitive**, the typical white collar middle class administrative jobs, but they are in steep decline (see the yellow line in the graph below).
- **Non-routine analytic**, the demand for this type of work is rising fast.
- **Non-routine interactive**, the demand for this type of work is growing even faster (see the green line in the graph below).



Slide 5

The category of 'routine cognitive work' is in strong decline

The most important line in this chart is the yellow line. These are the typical white collar middle class jobs. The work follows the same scheme every day: people do what they have learned to do at school. This category of skills shows the steepest decline. This means that in our societies we need fewer and fewer people who just reproduce what they have learned. The reason for this development is that these skills can be easily digitised. Computers are even better than people for these tasks. In addition, these skills can easily be outsourced. This poses a dilemma for schools in that the skills that are the easiest to teach and to test are the easiest to digitise, automate and outsource.

Demand is growing fastest for people with skills in two categories: 'non-routine analytic skills' and 'non-routine interactive skills'.

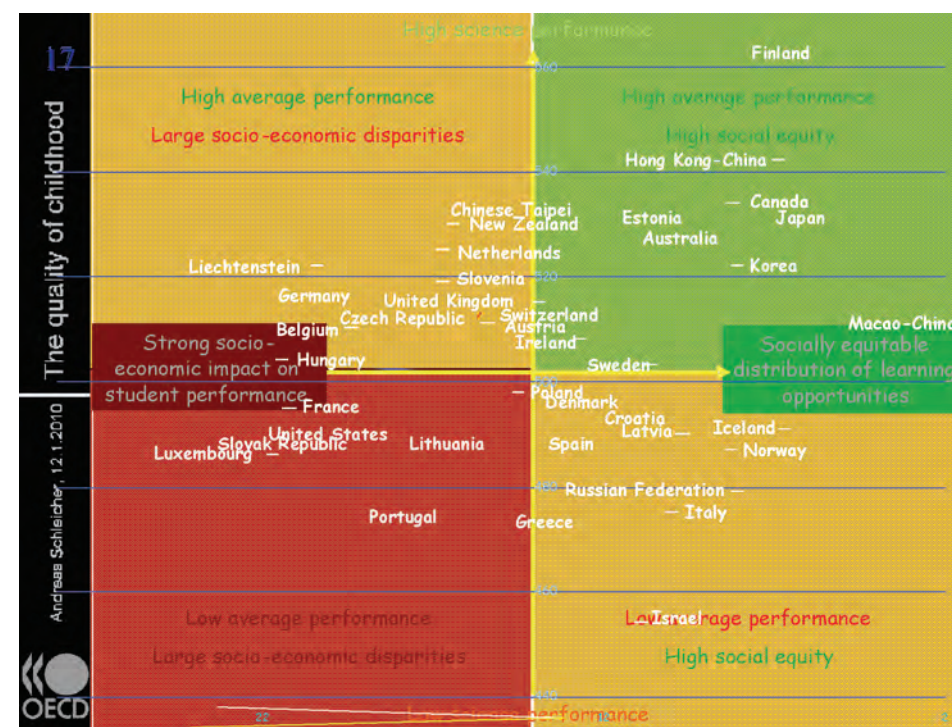
'Non-routine analytic skills' comprise the application of knowledge in new settings. It is the extension and creative use of knowledge. That is what we try to assess in the PISA test. Some people criticize us and say: It is unfair to test things the students have never seen before, because they were not taught to solve this exact problem. But that is exactly the setting students will find themselves in when they leave school. The OECD has really

developed these kinds of assessments and has achieved good results. Extended tests take place every three years.

The 'non-routine interactive skills' is the category for which demand is rising the fastest and it is therefore the most important category for the PISA team. It concerns the capacity to communicate, collaborate, manage and resolve conflicts. More and more people with these kinds of skills are needed, but these capacities are the most difficult to measure. The PISA team is working hard to develop the right type of tests to measure these skills.

The equity of the offering of learning opportunities has an important impact on the PISA score

The OECD Team has made a grid of the PISA score for science on the one hand (y-axis) and the measure of the socially equitable distribution of learning opportunities on the other (see slide below).



Slide 6

The impact of social background on the PISA score in science

There are some countries where the gap between 'winners' and 'losers' in the education system is very large. There the parental background from which the children come has a huge impact on learning outcomes. We could argue that this is normal: if parents are not educated, do not value education and do not invest in their children, then the children will not do well either. But this argument is not equally true across countries. There are some countries where the impact of social background on school performance is very large and there are others where it is much less so. The left side of the graph shows countries where the students' success depends very much on the success of the parents.

This is the case in the following countries:

- The Netherlands
- Belgium
- The Czech Republic
- The United Kingdom
- Germany
- France
- Hungary
- The United States of America
- Portugal

It could be argued that being part of the upper side of the graph is also desirable. The results are good, but they are very inequitably distributed on the left hand side of the graph. It is actually not very different from the traditional model of education: 'only some people can succeed'. This opinion includes the acceptance of large disparities. But that is actually not the way the world works today. The great thing about measurement is that through the data we have gathered we can see how the world works. The power of international comparisons lies in the fact that they can show what it is possible to achieve.

The countries that have a good PISA score for science and combine this with a socially equitable distribution of learning opportunities are as follows: (These countries do not replicate the socio-economic background of the parent via their educational systems. Instead, the system compensates for these inequalities.)

- Finland
- Hong Kong, China
- Canada
- Japan
- Australia
- Estonia
- Macao, China
- Sweden

This means that the group of countries on the left hand side of the graph can learn from the group of countries on the right hand side as far as this issue is concerned.

When we look at the graph we can see Finland on the top right hand side (see Slide 6). It scores very highly in its efforts to ensure that every child succeeds in education. The interesting thing about Finland is that there is not one educational system, as people tend to think, but there is a very high degree of individualization. There is a single approach for each child. Other than Finland, Canada and most of the East Asian countries are successful. In Hong Kong, for example, about 40 % of the school population are immigrants. Many of these children have parents who cannot read and write and the children tend to do really badly in first grade. But by the age of 15 the system has succeeded: from this point onwards, it is no longer visible (through testing) whether the children come from an immigration background or not. As we can see, there are some great successes in the field of equity that other countries can learn from.

On the left side of the chart we see the educational systems that really struggle with equity. In France, for example, where every student is taught in the same way, we find a highly

standardized system. But, equality in terms of input does not guarantee equality in terms of outcomes. **The most successful educational systems are highly individualized and personalized.**

The school system in the U.S.A is more equitable than in many European countries

The United States is often criticized for being a very unequal society, but, even so, the chances of a child from a disadvantaged background being able to succeed are much higher than they are in most European countries.

We have to bear in mind that slogans that sound very equitable, such as 'Every child is guaranteed a place at school' or, 'every child is taught a similar curriculum', do not at all guarantee equitable outcomes.

For example, in Belgium and France when a child needs to repeat a grade, the child is taught by a new teacher and the same teaching procedure (in terms of content and approach) is repeated. We know from the data that this solution stigmatizes and does not help the students. And we also know that it is actually very expensive. One child repeating a grade costs that society between 15 000 and 18 000 euros. In Finland children cannot repeat a grade; instead, a lot of time is spent in helping every child to succeed.

This also means that successful systems are not necessarily more expensive. A lot of time is wasted in the 'sorting engines' of the educational systems.

Germany is also inequitable

Germany, for example, does well on average but is also quite inequitable. At ten years of age the students are divided into two groups, one group is told that they did really well in their first four years at school and they are placed into the stream which will educate them to become knowledge-workers. The other two thirds of the students are told that they did not do very well during their first four years at school. These students are sent to vocational schools. In the end they will end up working for the knowledge-workers.

Inequitable school systems label children. They are fully aware of this. This is harmful to them.

Here we start talking about the quality of childhood: students of 15 years of age understand very well what the system expects from them, and their attitudes are influenced by the school-system. In Japan, for example, every child will say that he or she wants to attend the best university in Japan. In contrast, in Germany only 23% of 15 year olds will say that they want to go to university. Most of the children have understood that they are never going to get there.

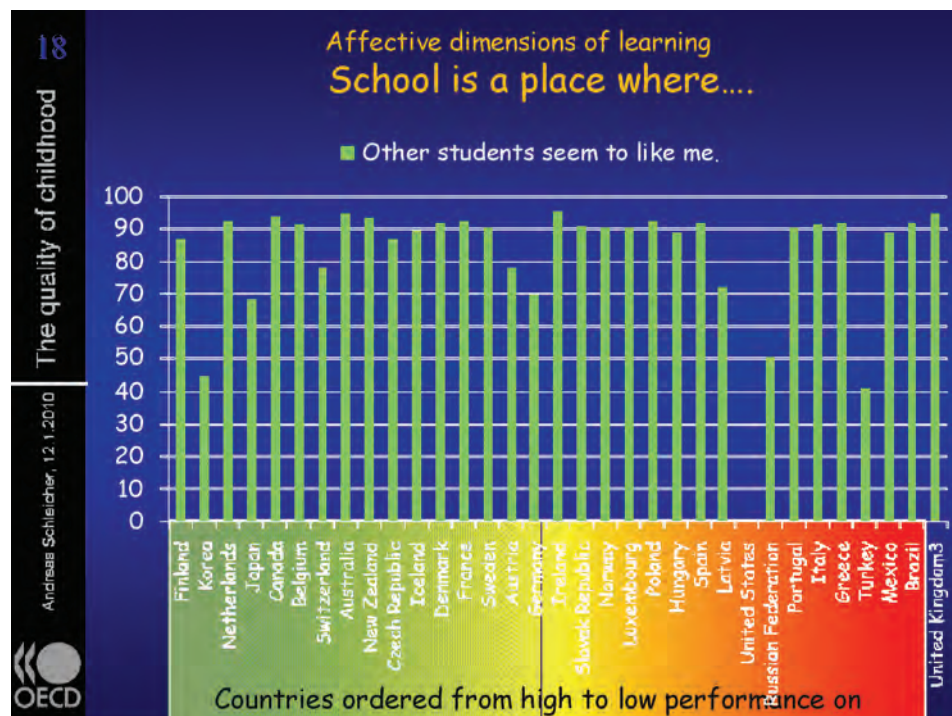
Conclusion

When the PISA tests were conducted data on the socio-economic background of the parents was collected at the same time. This allowed the statisticians to draw some powerful conclusions about the educational systems in the various countries and to formulate some compelling lessons for the less equal countries:

- There are countries where the educational system perpetuates the social inequalities of these countries. On the other hand there are also many countries where the opposite is taking place. In these countries socially equitable learning opportunities are provided for all students. This is brought about by the following:
 - a high degree of individualization of the education offered to the students with a tailor-made approach for each child.
 - there is a good support system for weaker students. They receive extra help to enable them to catch up. This extra help does not cost more, since they do not end up having to repeat a class. (As I mentioned before, repeating a class costs between 15000 and 18000 per child per year).
 - Quality and equity are therefore not only crucial for the quality of childhood, but also for all chances in life.

PISA has also measured how students feel about school

There are some other factors that have been measured by the PISA tests:



Slide 7

There is no correlation between the PISA score and the reply to the question 'School is a place where other students seem to like me'

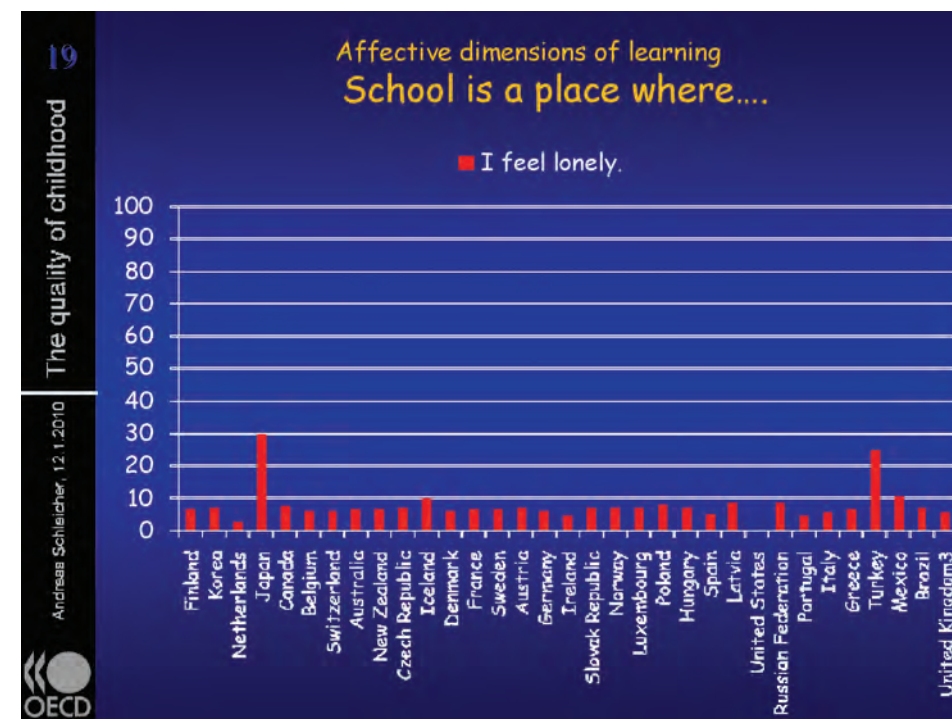
The countries are sorted by their PISA scores. We find a lot of variability among the countries with regard to student responses to the statement "School is a place where other students seem to like me", but there is no correlation with the PISA score (see Slide 7).

There have been additional surveys, the outcomes of which are shown in the following diagrams. In all these graphs we can see that the outcomes have nothing to do with the PISA scores.

For example, there are some countries where students do quite well on a science test, but if they are asked if they recognize the life chances that science provides for them, they will not be aware that subjects such as mathematics or chemistry have a relationship to their future life.

In one field a great step forward has been made: the gender gap has disappeared

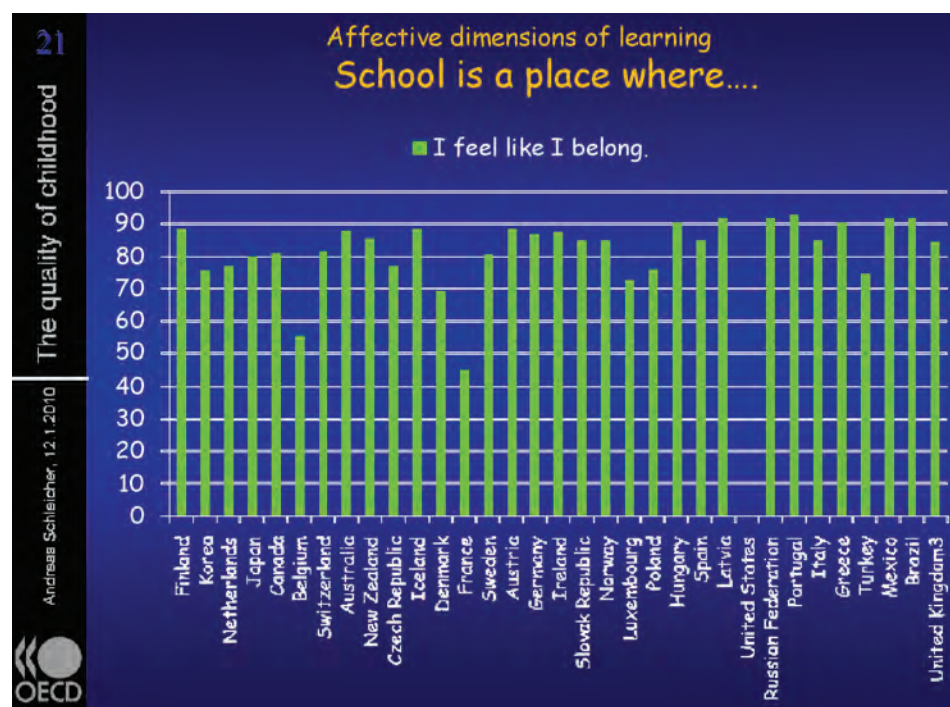
An interesting fact is that we do not find gender gaps in our tests anymore. Schools have bridged these problems. There are some small differences in reading between the sexes, but boys and girls both do well in mathematics and science. However, if they are asked what the different subjects mean to their lives, we find huge gender differences. These gender differences predict the children's future career pathways. It is the children's perceptions and beliefs that are important here, rather than the subject knowledge that they have acquired.



Slide 8



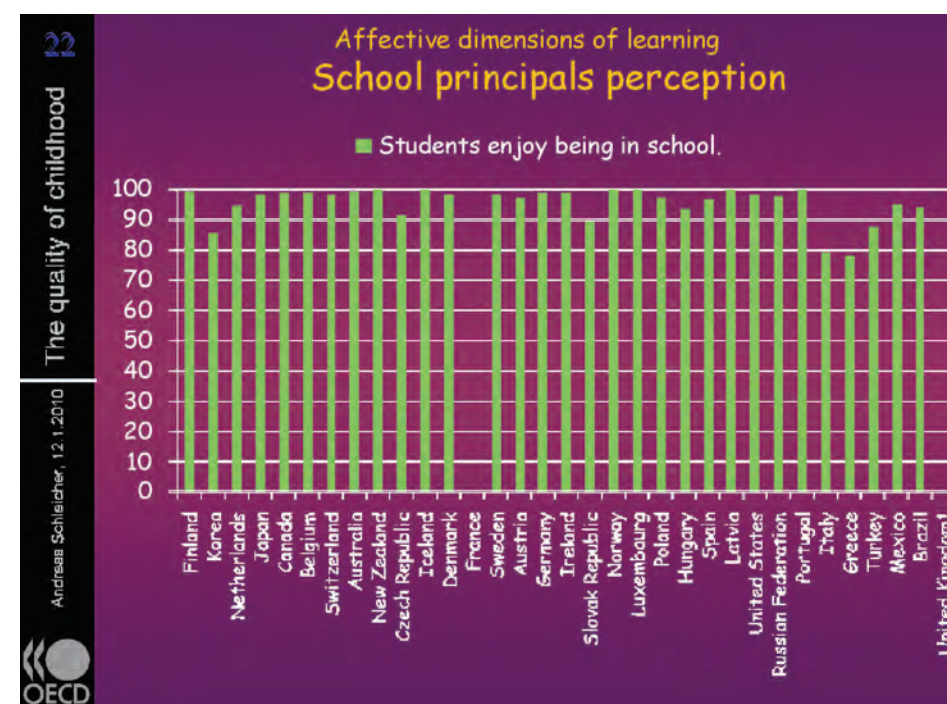
Slide 9



Slide 10

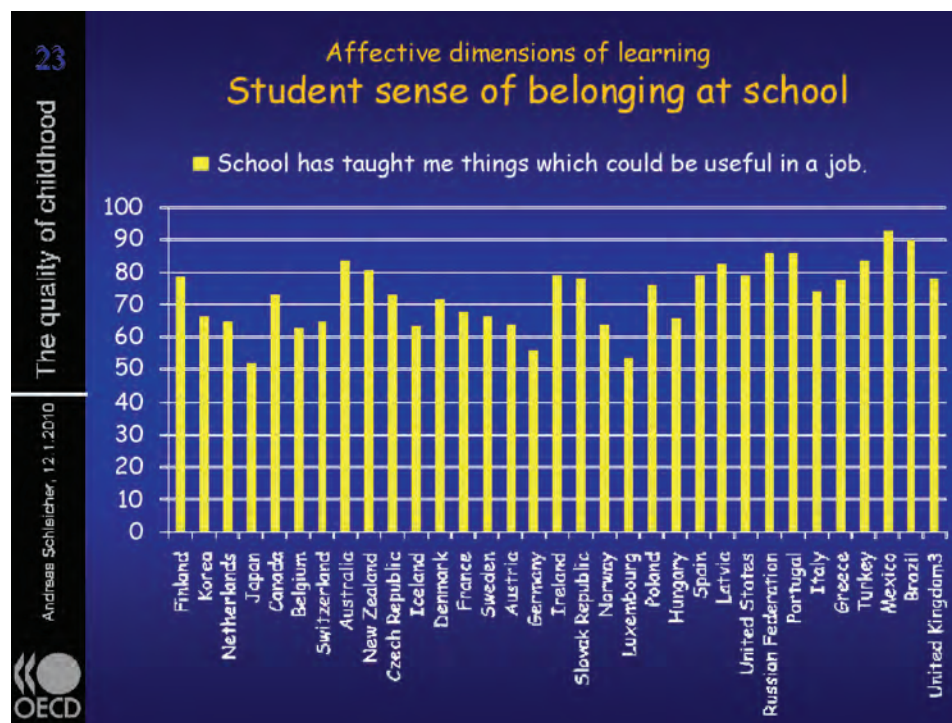
School Principals overestimate the level of happiness of the students in their school

School principals were asked what they thought about their students' morale. We can see that the 'system' thinks everything is working fine. France decided not to collect data about this question and the data from the U.K was not robust enough to be shown here. Other than these exceptions the picture is consistent and does not match what students actually think about school.

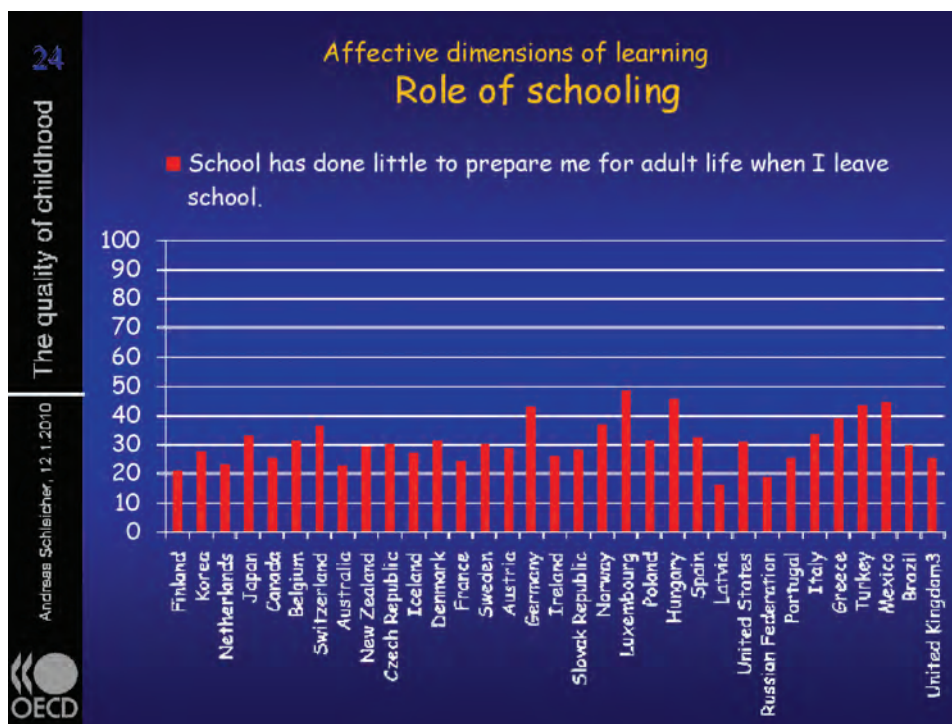


Slide 11

Students are sceptical about school being capable of teaching them things that could be useful in a job (Slide 13). In Japan, for example, only half of the students believe that they learn things at school that will be useful in the world of work. Brazil is the country with the lowest performance in terms of OECD Standards, but here students believe that they have learned something at school that will help them when they are working. It is interesting to note the variability in the outcomes of the survey.

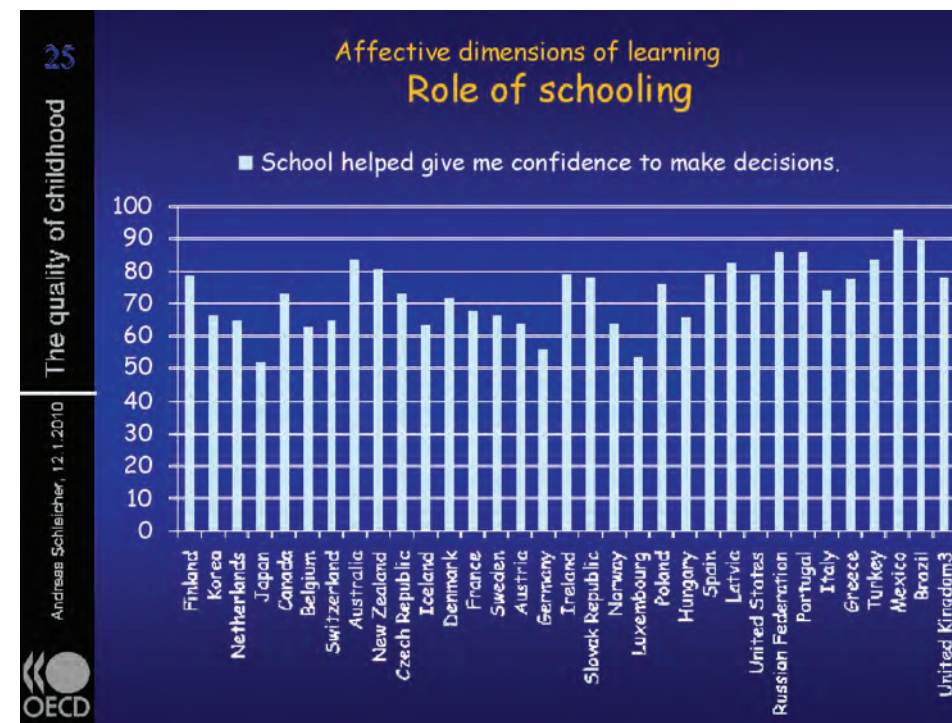


Slide 12



Slide 13

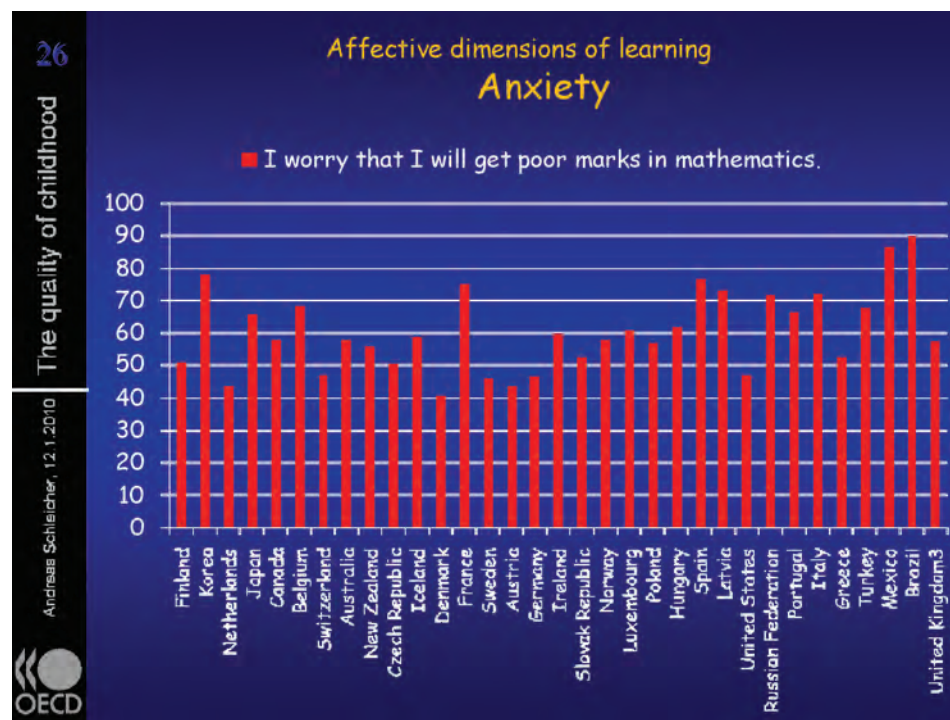
We noticed a lack of confidence in students, even in countries that did quite well on the PISA tests (see Slide 14). However, in the U.S.A, for example, it is the other way around. The U.S.A does not do particularly well on any of the PISA tests, but the students are very confident about their own abilities.



Slide 14

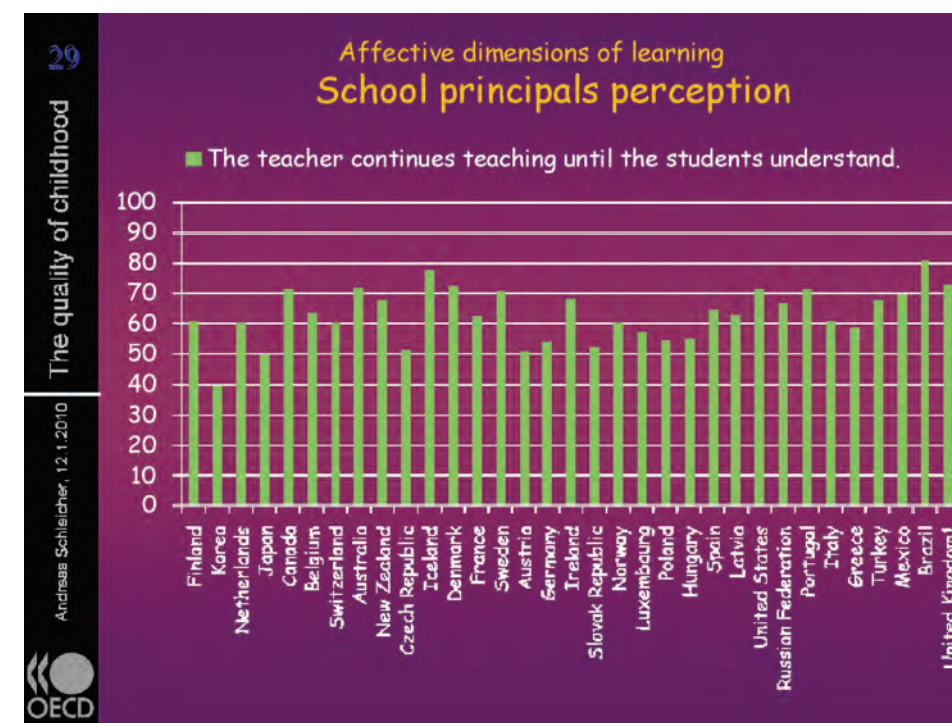
Anxiety about achieving poor marks is high in all countries, but we can still see significant differences (Slide 15). Having high expectations is a very high predictor of success. Most of the successful systems have high expectations with regard to their students. But, at the same time, they have a culture of support to back up these expectations. This back up support becomes visible in the lower levels of pressure felt by the students. High expectations should go hand in hand with high levels of support, if this is what the student needs. The Netherlands do really well in mathematics and Dutch students have the feeling that they can manage well in mathematics. This does not mean in countries where students are less fearful about achieving poor marks in mathematics that the country as a whole is less ambitious. This relationship does not exist.

In Norway, for example, schooling is not very difficult for children, as the demands that are put on them are not that high. But we can still see that the level of concern of students are as high as anywhere else. So we find that it does not depend on the objective standards that are set, but it depends on the discrepancy between expectations of the students and the support with which they are provided.

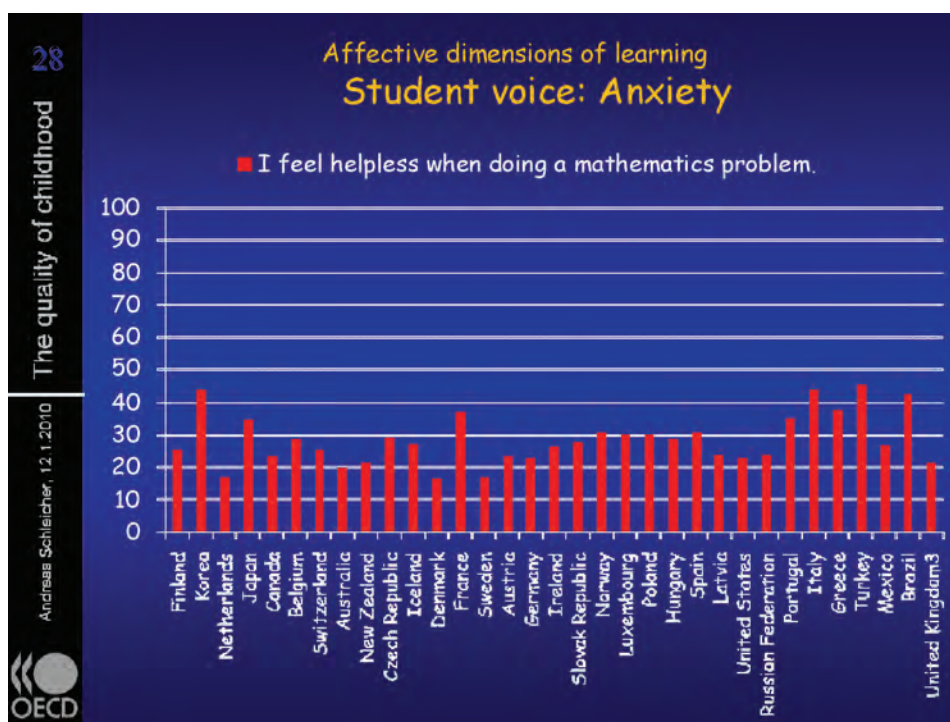


Slide 15

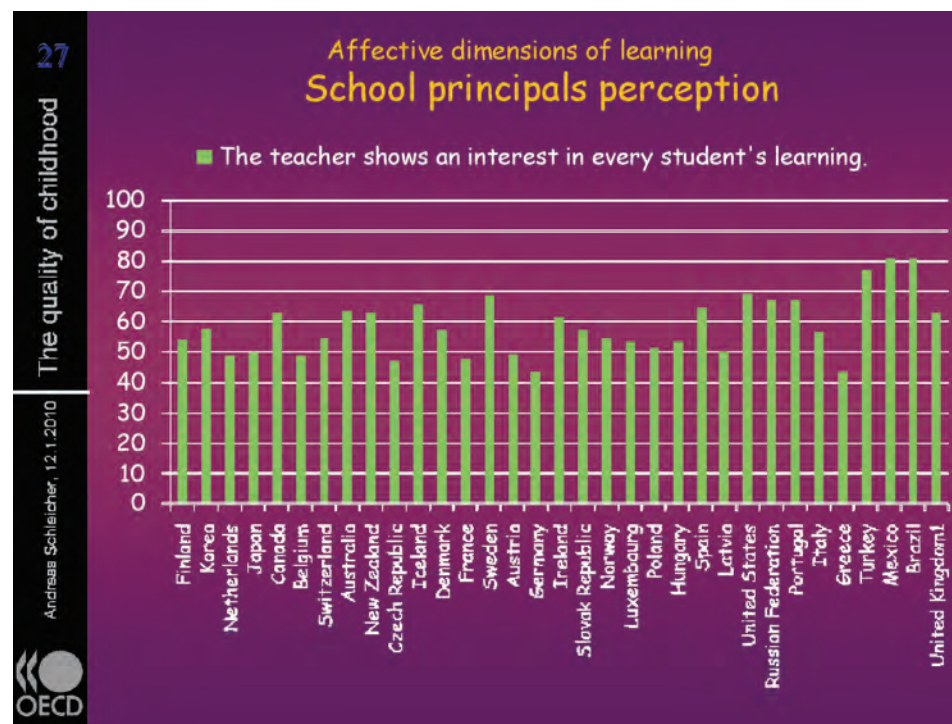
Many of students feel helpless when doing a maths problem. However, principals think that teachers continue teaching until all students have understood (Slides 16 -18). I have chosen the subject of mathematics to illustrate this point, but the responses for other subjects are similar.



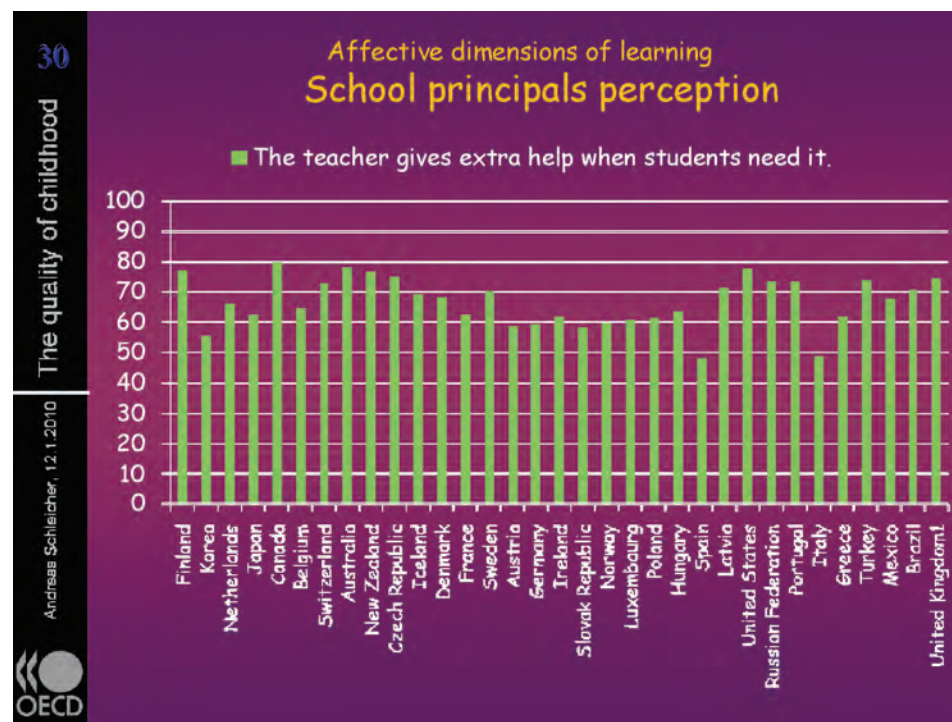
Slide 17



Slide 16



Slide 18



Slide 19

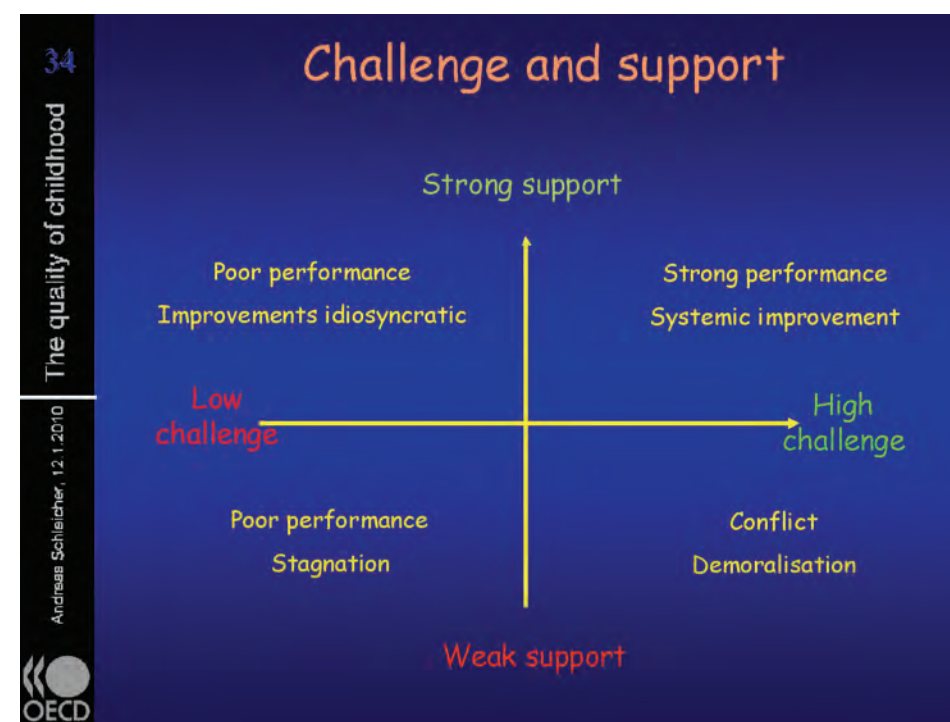
The characteristics of the best school systems

High expectations and a strong culture of support provide the best results

- What we have learned about successful school systems in terms of quality and equity is that the level of expectation from the point of view of the students and of the teachers is a very important determinant for success, if it is combined with a culture of support.
- The system is furthermore characterised by rigour, focus and coherence.
- Most of the successful educational systems attract the best people into the teaching profession and provide access to best practice and quality professional development.

A closer look at the Challenge and Support Grid

If we look at the two dimensions together: support and degree of expectation (Slide 20), systems that do not expect very much and do not have a culture of support can usually be found in the bottom left hand corner. There we do not find much in terms of high performance or improvement. The Nordic countries, for example, are always portrayed as being very successful. This is true of some of them, such as Sweden and Finland, but it is not true of Norway or Iceland, for example. The degree of challenge and support is very different in each of these countries' educational systems. In the U.K, for example, the level of expectation has been raised, but without the provision of a culture of support. There we do not find much improvement in the results. In Denmark the educational system has a wonderful support system and yet this system is not among the best, as the expectations of the students are not high.



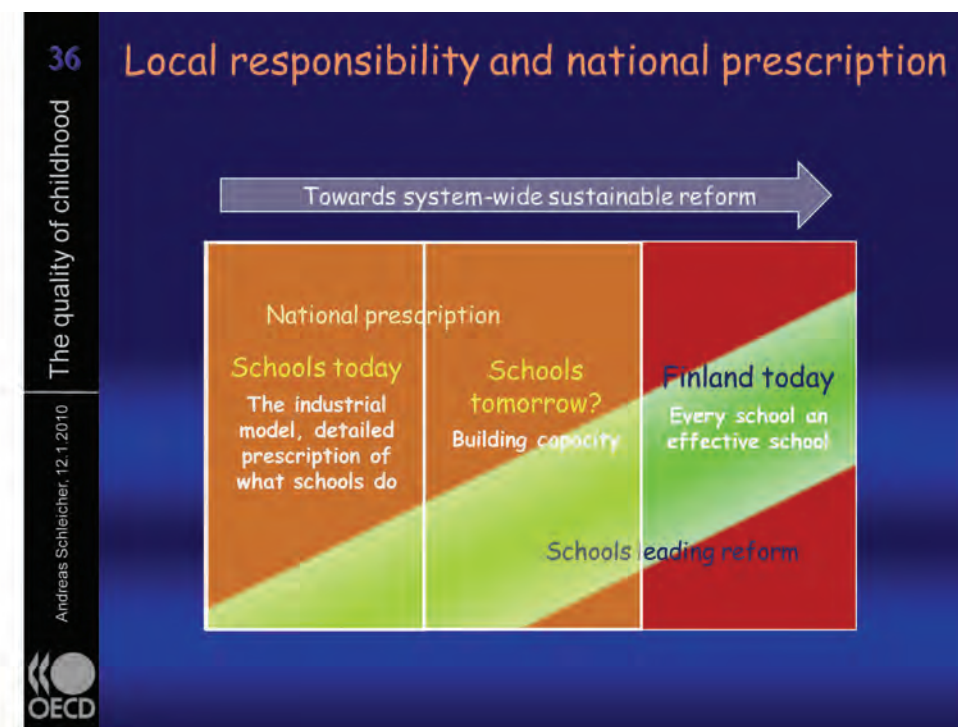
Slide 20

Let's take a closer look at the Challenge and Support Grid, in terms of the countries that we have just mentioned:

		Challenges	
		Low	High
Culture of support	Strong	Denmark Norway Iceland	Finland Sweden
	Weak		UK

The best school systems are characterised by the high autonomy of individual schools, while they are at the same time strongly connected to each other in a network structure. Another aspect that could be observed during the test is that successful educational systems give schools a lot of responsibility (Slide 21). Successful school systems also have the capacity to intervene when things go wrong. That is part of the problem that countries with weaker school systems have: they just do not know how many schools struggle. Belgium is an example of this. On average the country does quite well, but there are schools with really discouraging results and the system has no way of figuring out which these schools are. Parents know about the problems and do not send their children to these schools, other than the parents who do not have a choice in the matter.

The level of delegation of responsibility to the schools is always in flux, but we have noticed that the school systems that perform better have delegated more responsibility to their schools.



Slide 21

Finland has the highest PISA score and the lowest variability between schools

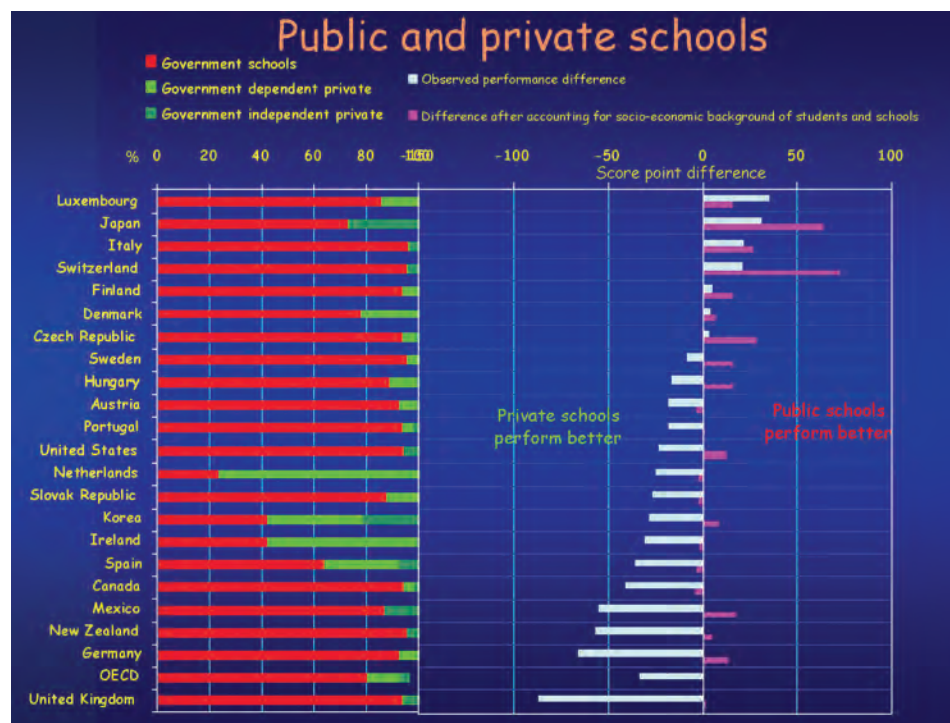
The most impressive statistic about Finland, for example, is not its high average of points in terms of performance on the PISA score. The most impressive statistical figure is that there is only a five percent variability between schools. This figure tells us that every school in Finland succeeds. In other words, every teacher knows what is going on in the neighbouring classroom, and every school knows what is going on in other schools surrounding it, the system knows about the problems in the schools. It is actually very easy to run a system like the one in Belgium, where some schools are doing well and others terribly badly. It is not a question of testing. Finland, for example, does not have a strong national system of testing.

Public schools can be as good or better than private schools

It is also not a question of sending children to public or private schools (Slide 22). On the left hand side of the chart we can see:

- in red, the proportion of students who go to public schools,
- in light green, the proportion of students who go to private schools that are publicly financed,
- in dark green, the proportion of students who go to privately run and privately financed schools.

We can see that private schools actually do better in most countries, but that this is largely the effect of social background, as the most privileged children attend these schools. The level of responsibility given to schools is not related to who pays the school or who runs the school. We could argue that every public school in Finland carries more responsibility for its own affairs than any private school in France.



Slide 22

Replicating or compensating for social differences

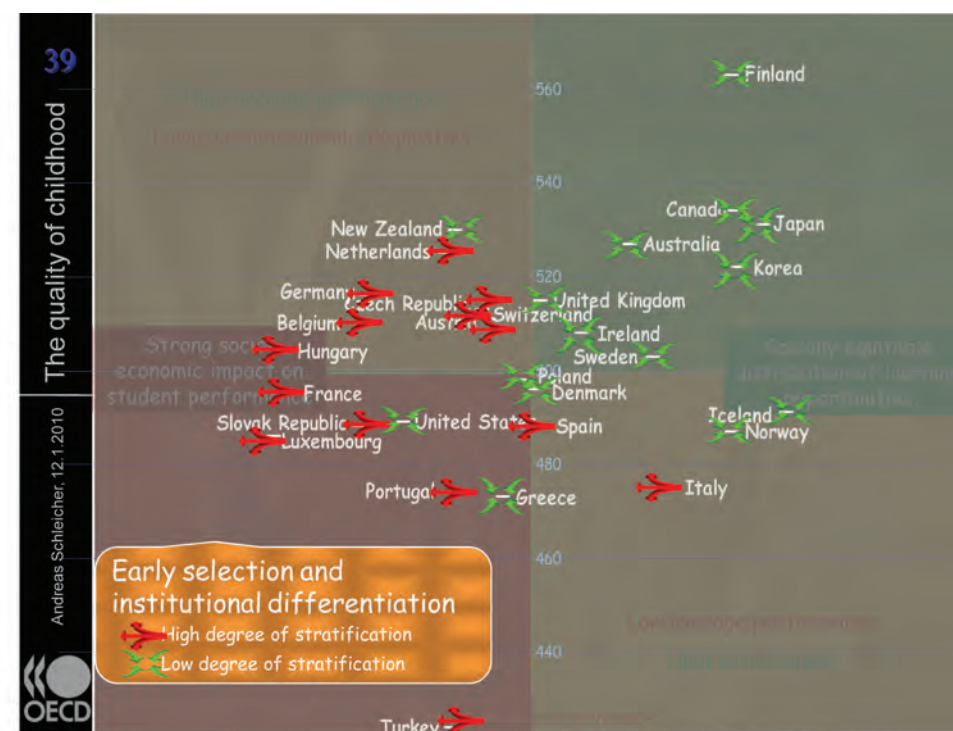
On the right hand side of the diagram you can see the differences in performance of the private schools vis-à-vis the public schools: the white bars pointing to the left indicate how much better the private schools do compared to the public schools. This is most strongly the case in Germany and in the U.K.

If the public schools do better than the private schools, then the white bars point to the right. The three top countries in this category are: Luxembourg, Japan and Italy.

The PISA statisticians have corrected these outcomes, taking into account the socio-economic background of the students and the schools. These are the red beams pointing both to the left and the right. What the data shows is that Luxembourg, Japan, Italy, Switzerland and the U.S.A compensate for the disadvantaged background of the students: thus the students achieve better scores than their socio-economic backgrounds would suggest.

In the U.K the school system just replicates the socio-economic differences of the students' parents. In Canada we can see that the school system reinforces the socio-economic differences of the parents, in other words, that the educational system strengthens the position of the children who are better off, while 'pushing down' those whose position is weaker to begin with. Fortunately, this red bar which goes to the left is very short.

The diagram below demonstrates that the Green Educational Systems do better than the Red ones. The Green Systems have a low degree of stratification, have well integrated pathways and are highly personalized. The Red ones are the opposite.



Slide 23

This diagram is built up as follows: the y-axis is the PISA score, the x-axis is the degree of 'socially equitable distribution of learning opportunities'. In the diagram the educational systems have been divided into two categories:

- the Green Educational Systems
- the Red Educational Systems.

The Green Educational Systems

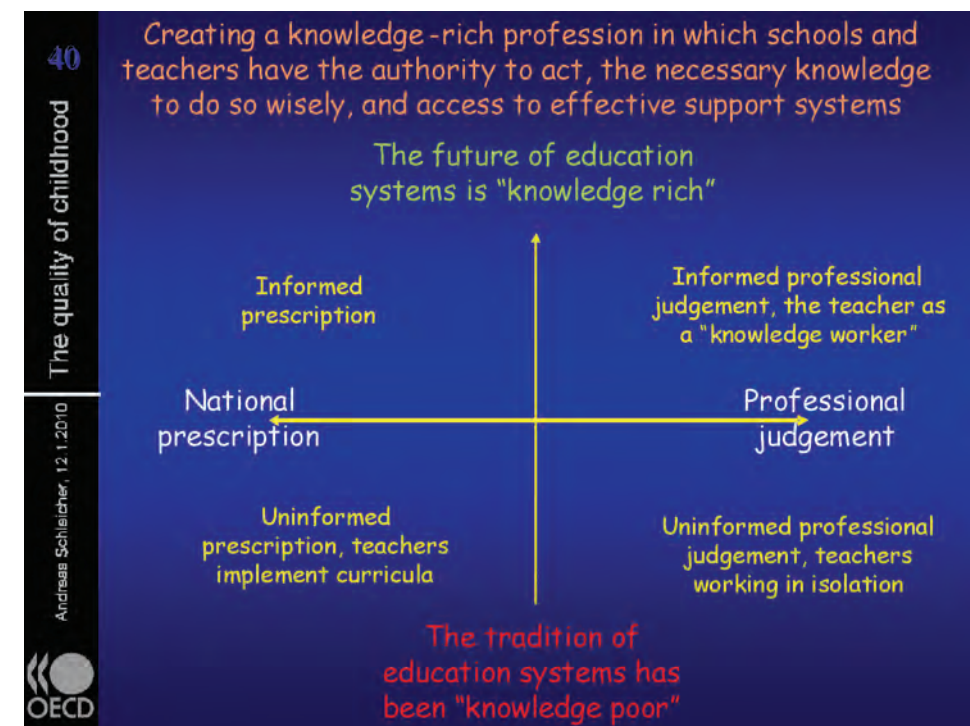
The Green Educational Systems indicate systems that have a low degree of stratification and which have well integrated educational pathways. They do very little in terms of tracking and streaming and simultaneously emphasize individualization and personalization. The division of students into different streams takes place at a fairly late point. Furthermore, teachers are directly responsible for the child. 'Problem children' cannot be asked to leave the school. Japan is a good example in this respect. Teachers have to establish a relationship with their students. This is actually quite serious: as a Japanese teacher you lose face if one of your students fails. I do not want to deny that there are also, of course, negative sides to this picture, but the strength of the system is the level of responsibility that Japanese teachers face. When entering a Japanese school one may well be confronted with up to 2000 students, but if you ask the school principal he or she will know the name of every single one of the students.

On the chart we can see that the 'green systems' are on the right hand side, where the impact of social background is not particularly strong.

Red Educational Systems

The Red Educational Systems have a high degree of stratification and an early selection process. (This is the point at which students are sent to the various levels of the school system.) Here the educational pathways are less well integrated, there is more emphasis on tracking and streaming, and, at the same time, less attention is given to each student. As a teacher you can send 'problem children' somewhere else.

The red educational systems are mainly situated to the left hand side of the diagram. The left hand side is characterised by the strong impact of socio-economic background on the performance of children. These systems are not very effective in helping children from disadvantaged backgrounds to succeed in life.



Slide 24

The future of education systems: knowledge rich and a high level of professional judgment by teachers and the teams in which they function

What the above slide portrays is self-evident: the better educational systems at present and/or in the future are characterised by:

- a gradual delegation of power, knowledge and interaction from the Ministries of Education to the schools and to the teachers,
- a move towards the exercising of a higher level of professional judgment by the teachers and the teams in which they function.

Discussion

Question: One of the main aspects of successful educational systems seems to be individualisation. What about measuring, on an international level, the impact of disabled and non-disabled children learning together?

Answer: One of the main lessons that we have learned, and this includes all forms of diversity, is that students benefit from diverse learning situations, whether the diversity has to do with disability, or social-economic status or other types of difference. Most successful systems embrace diversity. We have not yet broken the data down specifically to consider disability, probably that could be done statistically. But essentially what we can see is that integration is a very powerful tool: it gives the students perspectives on

diversity and it also forces teachers towards diversity. What often happens is that when teachers have the possibility to select students they say 'I teach great lessons but I have the wrong students.' This temptation does not exist in systems that include diversity. Initially, the objective of the PISA Study was to discover the most efficient education system in existence (among the countries surveyed). But, to our surprise, we discovered that the old system of confronting children with knowledge, teaching and testing them is not the most efficient system. Instead, diversity and heterogeneity, when matched with a personalized structure, leads to the best results.

Question: The PISA test cannot capture school absences, which means that the most disadvantaged children, for example, the Roma children, are not shown in any way in the results.

Answer: That is true – the test only compares students who are enrolled at school. We know that there are a significant proportion of children not enrolled at school, especially in the Eastern European countries. And we do not know anything about them.

Question: Are there ideas to address the problem?

Answer: We are currently piloting an extension of PISA that goes to households and other places to assess children who are outside the educational settings. In Europe it is not a major problem as about 95% of children are enrolled at school. But for countries where high numbers of children do not attend school we are developing a survey for households and families. It will be in place in 2012.

Question: Did you also compare the age of entry into formal learning across the different countries? In Finland, for example, children do not begin formal education until they are 7 years old.

Answer: We have discovered that the age of entry into formal schooling bears no relation to the PISA scores. However, we can say that children who have been in early childhood education for a sustained period and care do much better on the PISA test than others. Basically, we can say that two years of early childhood education and care are worth more than two years of mathematics at the age of 15. But this does not say anything about formal schooling. In a country like Finland, for example, we find early childhood care, but not formal schooling. It is really interesting: there are countries where children go to school at an older age and do well and countries with the reverse scheme.

Education is still a very "knowledge poor" environment. We have strong beliefs: we tell people what to do, but we know very little about the efficiency of our practice. The old system of one education minister knowing what is good for hundreds of thousands of students does not work anymore, what we need is a system that combines the knowledge of the students and the teachers. We need to find out more about how learning really works.

Andreas Schleicher, based at the OECD in Paris, is the leading architect and manager of the PISA Survey. When Andreas Schleicher attended elementary school his teacher said that he 'would not qualify to go on to higher education'. However, his father sent him to a Steiner-Waldorf-School in Hamburg, where he obtained his Abitur (University Entrance qualification) and achieved excellent grades. In 1988 he obtained a BSc degree in Physics (Vordiplom) at the University of Hamburg and in 1992 he was awarded an MSc Degree in Mathematics at Deakin University in Australia. After graduation he worked in the area of student assessment and quality improvement in various functions until he joined the OECD in 1994, where he quickly became the driving force behind the PISA Programme. For his excellent work on the PISA Study he was awarded the Theodor Heuss Prize in 2003.