

Impact of International Assessments

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First of all, please accept my apologies for doing this presentation in English. It's not my native language either, but I think it is the only language we can use to communicate this morning.

I would like to thank the CNE for this invitation. It's a pleasure to present our work to you here, since Portugal has actually been a very active participant in our work on international comparisons, which I will be speaking about.

My presentation is about the impact of international assessments and one of my aims is really to look at the impact beyond the rankings.

One of the things we always look at first when we see the international results is where countries come out in terms of quality and in terms of equity, but there are many other dimensions that can influence the debate in participating countries.

Impact of international assessment

- 1. Know why you are looking**
 - The yardstick for success is no longer just improvement by national standards...
... but the best performing education systems globally
- 2. Know what you are looking for**
 - Understanding the competencies that matter in a global context...
... and collaborating on strategies to assess these
- 3. Search systematically**
 - Benchmarking success through comparing quality, equity and efficiency in education globally
- 4. How do we know that we found it?**
 - The challenge of external validity
- 5. And then what do we do with the results?**
 - Understanding what contributes to the success of education systems and improving performance .

Impact of International Assessments
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16 September 2009

Slide no. 1

First of all, *why are you looking at international assessments?* Why do we compare internationally? Because we live in a world in which improving by national standards is very important but to look at how everybody else is changing is also important. If the context around us is changing fast, then improving in national standards alone is not enough. One of the things international assessments can tell us is the pace of change, the pace of improvement, catching up with the rest of the world.

Second, *what are we looking for?* How do we define quality in education? How do we define equity in education?

There is no straightforward answer, but we can say that global comparisons, global collaboration, can provide important answers to questions like What are those kinds of skills that make people successful?, How do we measure them?, How do we compare them?

This is a debate which no country can answer by its own. However, through working together countries can collaborate in finding answers to those kinds of questions.

Third, *Search systematically*. Even here there are big changes to be considered and understanding those changes is a very important topic where assessments can influence debate: The kinds of competences that made our parents successful are no longer the kinds of competences that will help our children to succeed.

How do we benchmark quality, equity, efficiency in education? These are also very important dimensions where assessments can help us.

Yet, *how do we know that we found it?* How do we know that we get the answers right? When you devise your national curriculum in Portugal, how do you know that what you teach is really what matters? A lot of hypotheses are going in, and that's the same with international assessments.

When you have an examination system, how do you know that what you test is what really matters for people in their life? It's a challenge of external validity and it's another challenge where global comparisons can be very instructive.

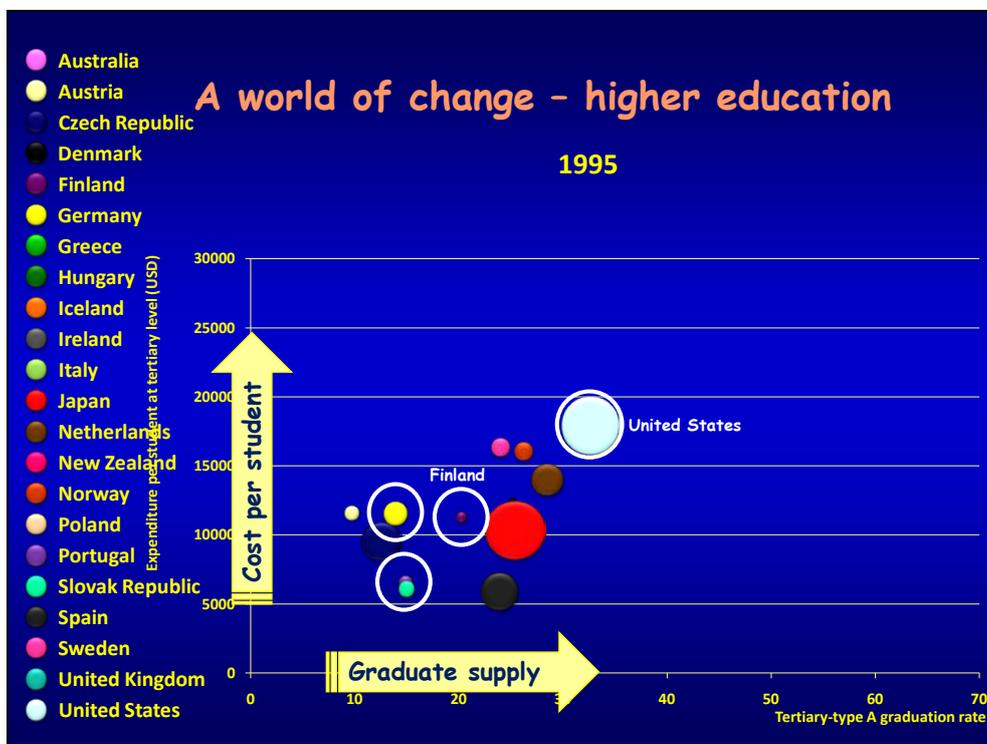
And finally, *what do we do with the results?* What can we learn from this?

I'm sure this is also going to be the focus this afternoon basically: the kinds of lessons that you can learn.

As the Minister said, this is not about copying and pasting education systems. Nobody can copy solutions. But international assessments can help us to understand the drivers of success, what makes different education systems successful. And from that we can think about the way we can configure those drivers in our own national context.

So this is the kind of questions I want to answer with you today.

I'd like to start with something that isn't just about assessments, that's about our comparisons of higher education, because that's where we see the most dynamic changes.



Slide no. 2

Every dot on this chart is one country and the chart is two-dimensional. On the horizontal axis we see how successful countries are in producing high qualifications, university graduates. On the vertical axis you can see what countries spend per student. That is, success and cost.

The size of the dot shows you where the money comes from. The larger the dot, the more money is mobilized from the private sector.

As you can see, the United States takes the lead in terms of graduate output, very far to the right: lots of people get high qualifications. It is also number one in terms of spending per student: lots of money is available for each student. In addition, the dot is very big because a lot of money gets mobilized from the private sector.

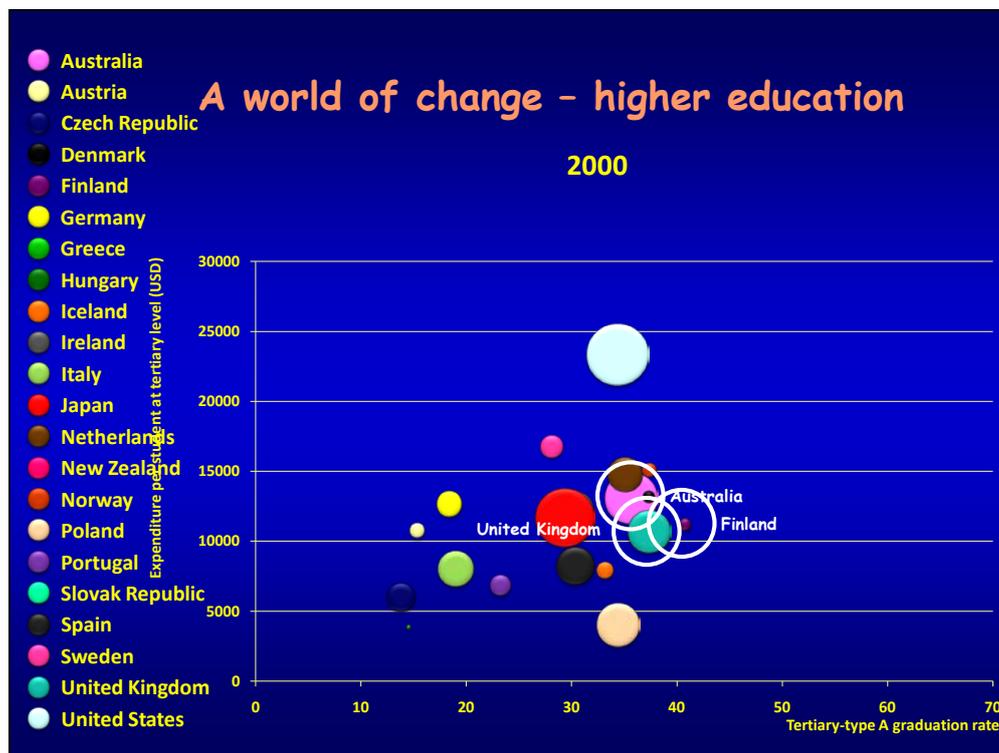
Finland is moderately successful in graduate output and moderately expensive, in the middle of countries. On the other hand, the dot is very small, which means parents don't have to pay, it's all provided by the government.

Germany, for example, is pretty much to the back: University education does not have such a strong tradition.

Portugal is at the end of this scale in terms of output, not that expensive, but showing a lot of public expenditure.

The only thing I haven't said so far is that this was the picture in 1995, about ten years ago.

Now, I want to show you how quickly the world has changed. If you look at the picture above (1995), you'll see how far the United States is ahead of Portugal. Five years later the world looks different. By 2000, you can see many, many countries moving very quickly to catch up.

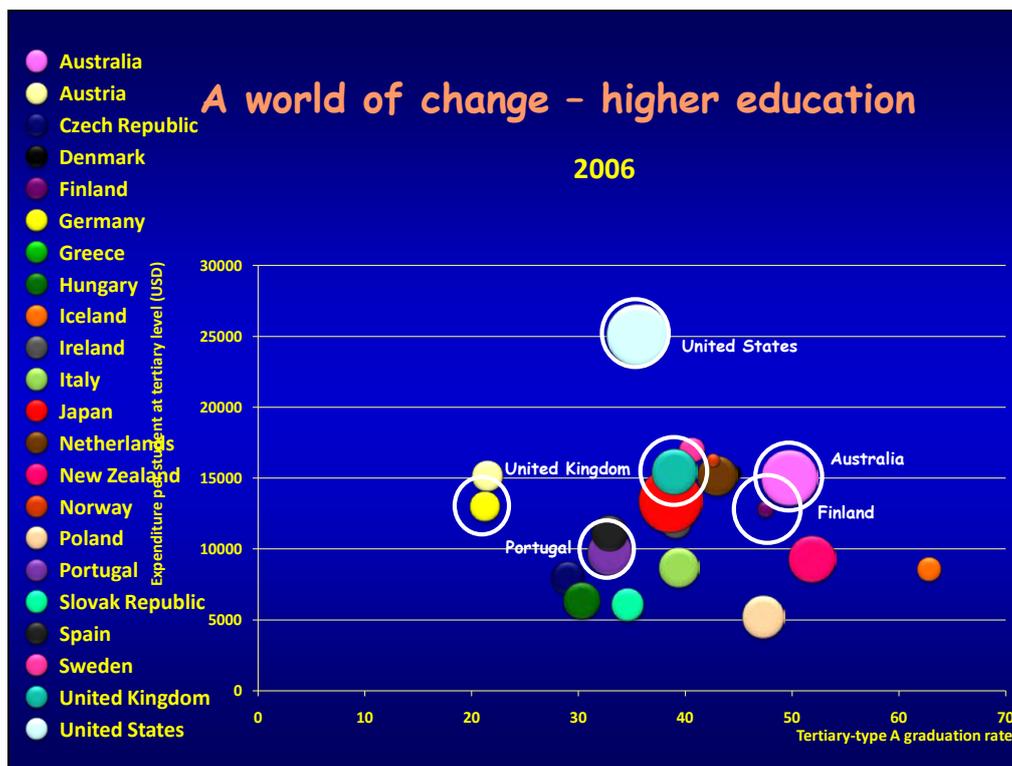


Slide no. 3

The United Kingdom moved to the front. Australia is also a very successful country in moving forward. But look at Finland! Do you remember where Finland was five years before? From the middle of countries, it moved to number one, in five years of time.

This shows that improvement by national standards is not enough. Every country is improving, every country is moving to the right, and actually Portugal is in a great place in points, as well. However, you also see that some countries are moving forward much faster than others. This is why international comparison is so important.

But the world did not stop in the year 2000, as some people had predicted, things continued to move. If you look at 2001, 2002, 2003, 2004, 2005, 2006, what you see is a rapidly changing world. In ten years time the global education has fundamentally changed.

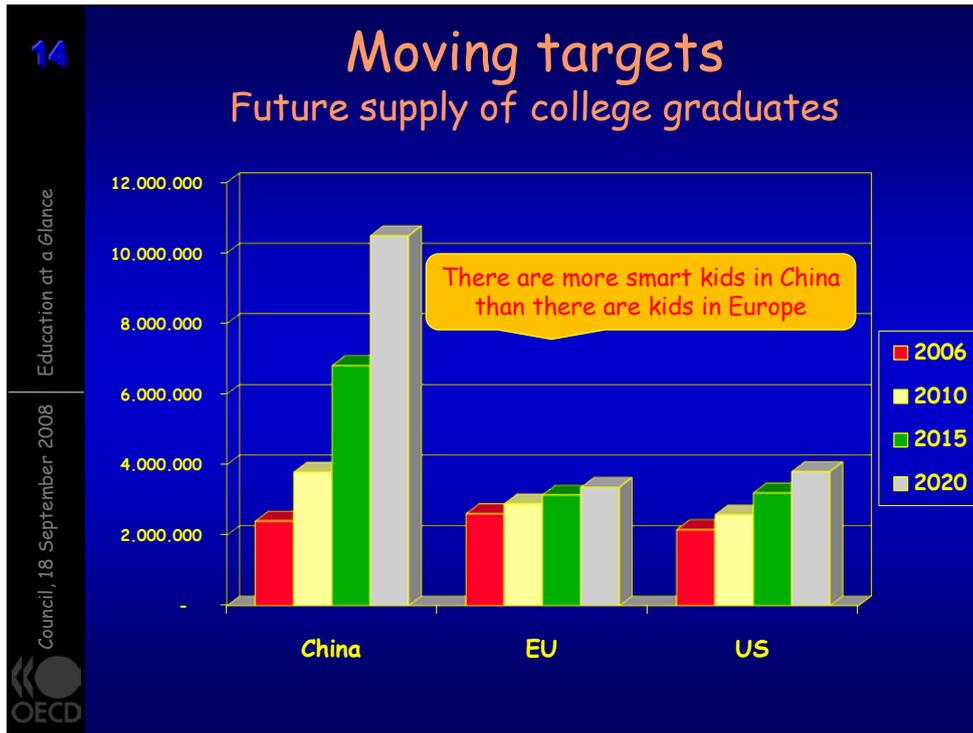


Slide no. 4

Do you remember the United States was number one in 1995? By 2006 it is an average performer. Has the United States declined in its graduate output? No, it didn't, it actually even improved. But everybody else improved so much faster. You can see Australia, Finland, United Kingdom, Germany and Portugal.

All I want to show you in this chart is really the rapidly changing world in which we live, and it is no longer a question that every country makes progress. Every country can claim its progression, but the pace of change is very different across different countries. And the world will continue to change.

Now I want to show you the comparison between China, the European Union and the United States in terms of the future supply of college graduates.



Slide no. 5

Take 2006. Basically, you can see that China, the United States, and Europe are more or less comparable in terms of the number of people with a higher level of qualifications. But look at what the picture is like the next year, 2010. You can see how countries like China, which are just starting to build up their education system, have been progressing. If you look at projections for 2015 and projections for 2020, you can see a rapidly improving education pattern, something that we couldn't expect by now. Europe has also improvements, the United States also a bit, but the world in the future will look very, very different in terms of the supply of qualified people. Of course this is all about quantity; we don't know how good these people actually are.

The only thing this shows is that the world in which we will be living will look very different. Globalisation will look very different. Nowadays, it is easy for the Western world: it is basically competing with countries (like China and India) that provide low skills at low cost. But the picture above tells us everything is going to change. In the future, competition will be with countries (like China and India) that provide better and better skills at increasing pace.

But this is again about quantity. However, this impact is very clear and puts pressure in all of us to increase the pace of change, to increase the pace of improvement.

15
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Andreas Schleicher
16 September 2009
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Know what you are looking for

Understanding the competencies that matter in a global context and collaborating on strategies to assess these

Slide no. 6

What, then, should education systems deliver? Assessments can have an important influence on the kind of skills that are being valued by society. You can argue that you can't improve what you cannot measure. What is measured gets valued. Let's have a look at this.

16
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Andreas Schleicher
16 September 2009



Schooling in the medieval age:
The school of the church



Slide no. 7

When school was invented and it was all easy: there was one truth and you just had to explain it to a lot of people.

17
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Schooling in the industrial age:
Educating for discipline




Slide no. 8

In the industrial age, schooling was also quite simple: it was about making people compatible with the norms of the industrial society. Basically, schooling was about giving young people a set of skills that would last for their lifetime. Very easy to do! It's a reproduction of subject-matter contents. That was the education of the industrial society.

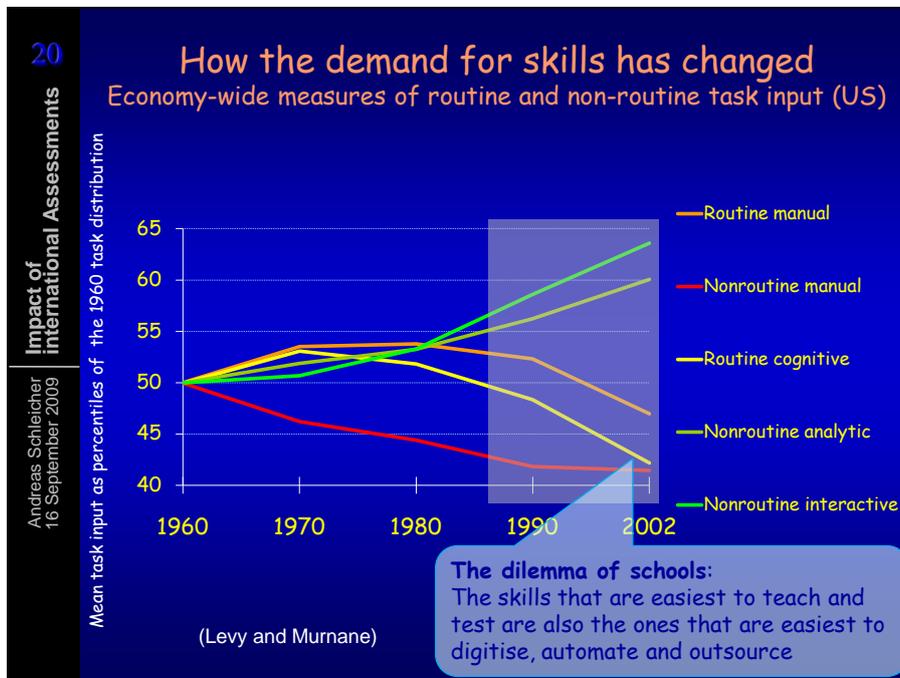
18
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Andreas Schleicher
16 September 2009



The challenges today:
 Motivated and self-reliant citizens
 Risk-taking entrepreneurs, converging and continuously emerging professions tied to globalising contexts and technological advance

Slide no. 9

And then the world has become more complicated, demand has increased, supply has increased, but the model of education hasn't changed very much in terms of skills. However if you look at the challenges that education faces today it's all about creating people that can continue learning throughout life. Take science for example. What do you teach young people? Half of the science that people will need in their lifetime doesn't exist by the time they are at school. Where is the relevant content? Let me show you these data for the United States. I do not have these data for Portugal.



Slide no. 10

This picture tells you that the nature of skills that make people successful is changing very rapidly too. It's another dimension that international assessments can talk about.

We can start with *routine manual skills*. In the 1960's and 1970's lots of factories were created and thereafter fewer and fewer is the need for people who earn their money with routine manual work. That's very clear because those kinds of jobs can be automated, machines can do them better than people. They can be digitised, computers can do this. They can be outsourced: in Vietnam and China people can do that cheaper.

If you look at *non-routine manual work* (work that you do with your hands but in ways that are harder to explain to a computer), you can also notice a decline but things are flattening out, non-routine manual work is quite safe today, because there are lots of jobs that you can't easily automate, digitise and outsource. Someone is going to clean up this room later on; you can't put a computer at it. You can't outsource your hairdresser to China. There are lots of jobs that are not very demanding but they are quite safe.

This is not what matters now because assessment is not about manual skills. Assessment is about cognitive skills.

So, what about *routine cognitive skills*? What I mean by this is the capacity to reproduce what you have learned: you learn something and later in your life you use that knowledge.

What have we seen in the labour market about reproduction of subject-matter content? Actually, when you look at the picture above, you can see that the decline in the demand for skills no longer occurs in the manual sector but in terms of routine cognitive skills.

Now, why is that important? Because those are the things that are easier to teach and the easiest to test. Assessment has largely been about those kinds of skills (routine cognitive skills). You teach somebody something and you test whether they have learned it. Very easy to do, multiple-choice tests can do that very well.

Yet, the picture shows that our modern world is less and less in need of routine cognitive skills. Very important lessons we can derive from those kinds of labour market statistics that shape the view of comparative assessment... You can see those lines all going down, they are decreasing in demand.

What is really rising in labour market's demand is actually *non-routine analytic skills*. It's not about the capacity to reproduce what you have learned but the capacity to extrapolate from what you have learned. To apply your knowledge in a novel situation that you haven't seen before, that maybe nobody else has seen before. A very important dimension and we see it is rising.

And that's something, I must say, on which we are putting lots of emphasis in PISA. PISA contains lots of tasks that require students to extrapolate from what they know and apply their knowledge in a non-familiar situation. This is one view assessment can take. It is another way through which assessment can influence our thought about education.

Some people say that's unfair, some people say PISA is unfair to students because they're testing young people with things that haven't been taught in school. And that's true. That's a true point you can make in any country. But if you take that line of argument you can also argue that life is very unfair to people, because in real life you are going to see lots of things that you haven't seen before, and the test of truth is not whether you remember what you have learnt in school, but whether you can solve those kinds of novel situations.

The US Department of Labour estimates that today's generation will have had 12 to 14 jobs by the age of 40. Lots of changes, lots of new situations people haven't been prepared to think about. And I think we are actually doing that quite well. That's the

kind of view, the kind of impact that PISA seeks to do and they are doing that quite well.

There is another class of competences, which we call *non-routine interactive skills*. This is about the capacity of people to relate well to other people - not people you know, not people who are similar to you (that's easy!), but people in heterogeneous groups. Basically you can see this section is steep rising in the market: How do you manage to solve conflicts? How do you collaborate? How do you work in teams? These are competences with very steep increase in the demand. They are also very hard to assess, and assessments like PISA do very poorly on them.

I think it's true also for national examination systems, national tests. I'm sure your curriculum talks like every other curriculum about the importance of interpersonal competences, but at the end of the day you give students an individual test, an individual examination to test their individual skills, so reality and ambition are often far away.

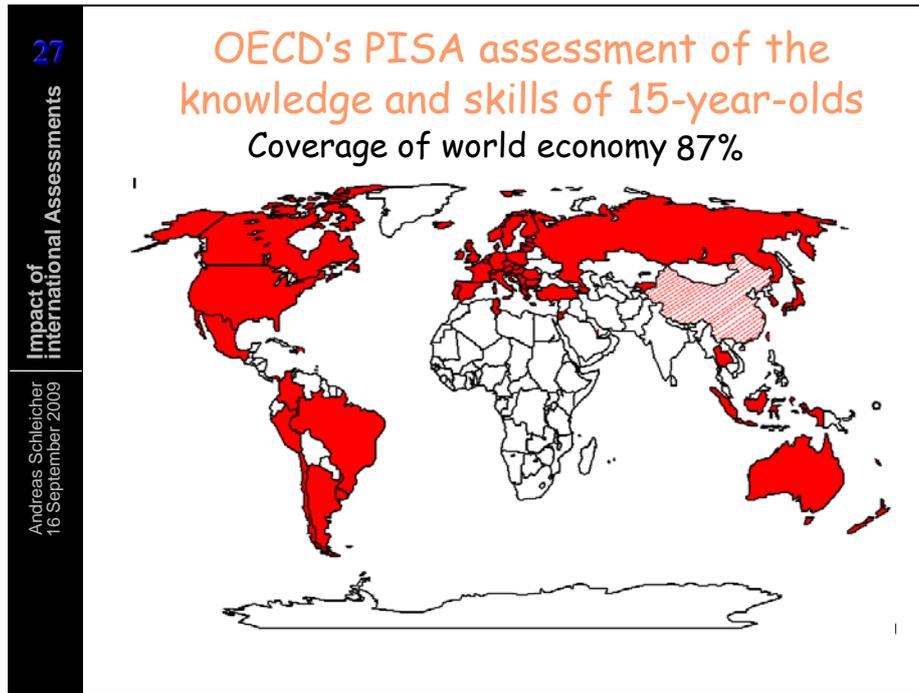
With all this, what I really want to show is the fact that in the course of ten, fifteen years the world will have fundamentally changed in terms of the demands for skills, the kind of competences that are valued. This is what comparisons can tell us. They can tell us how the world is changing in terms of quantity (we've seen that before), but they also can tell us how the world is changing in terms of quality, in terms of the nature of skills that matter.



Slide no. 11

We can translate this into the following questions: How do we stand on this kind of comparisons? We have already seen the kind of competences that matter, so, how do people come out of this?

This is basically where PISA comes in, and this map just shows the kind of countries that are currently comparing.



Slide no. 12

In China we have just covered about half of the country, India is just beginning to use PISA assessments. With this we get a quite good picture of the industrialised world: those countries, like Portugal, that have made a contribution in the world economy, the OECD countries, South American countries, Asian countries. We can actually say a lot about how well they do in terms of the kind of knowledge and skills that school systems provide for young people, people at the age of 15.

28
Impact of International Assessments
Andreas Schleicher
16 September 2009

How PISA has built on national experience

looking back at what students were expected to have learned

...or...

looking ahead to how well they can extrapolate from what they have learned and apply their knowledge and skills in novel settings.

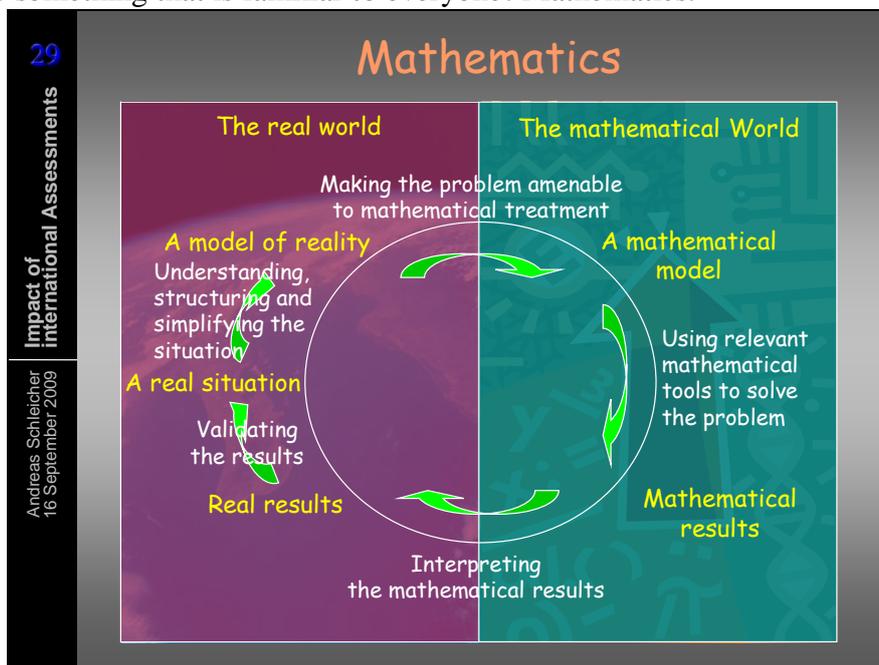
For the PISA assessment of the knowledge and skills of 15-year-olds, OECD governments chose the latter

Slide no. 13

And, of course, the first thing people do is try and look at results. That takes me to the second part: *How do we benchmark quality?*

Here is a very, very important question. This is one way where assessment can have a deep impact on a national debate. Not just through the results but through the way in which you define quality.

Let's take something that is familiar to everyone! Mathematics.



Slide no. 14

You can of course think about Mathematics as a world of formulas, of equations, of abstract thinking, but there's also the real world and the connections to be built between them. How do you ensure that Mathematics doesn't remain just a world of formulas, but a language through which students learn to structure, to understand the real world, and to mould the real?

In the PISA context, we start with a real situation, we confront students with something that they may have seen or may not have seen and then expect them to build a model of the reality. It's the first step.

Many students - that's a particular challenge for Portuguese students - many students in Portugal struggle with this. They know about the mathematical world but when they see a real problem they do not know why this could be a mathematical problem. They have difficulties in translating the real world into the world of Mathematics. If you struggle with those kinds of skills, what's the use of Mathematics? What value does an algebra equation have if you can't use it as a language to understand the real world, to structure the real world, to mould the real world? Portuguese pupils do well in "The Mathematical world" but using Mathematics is quite another story.

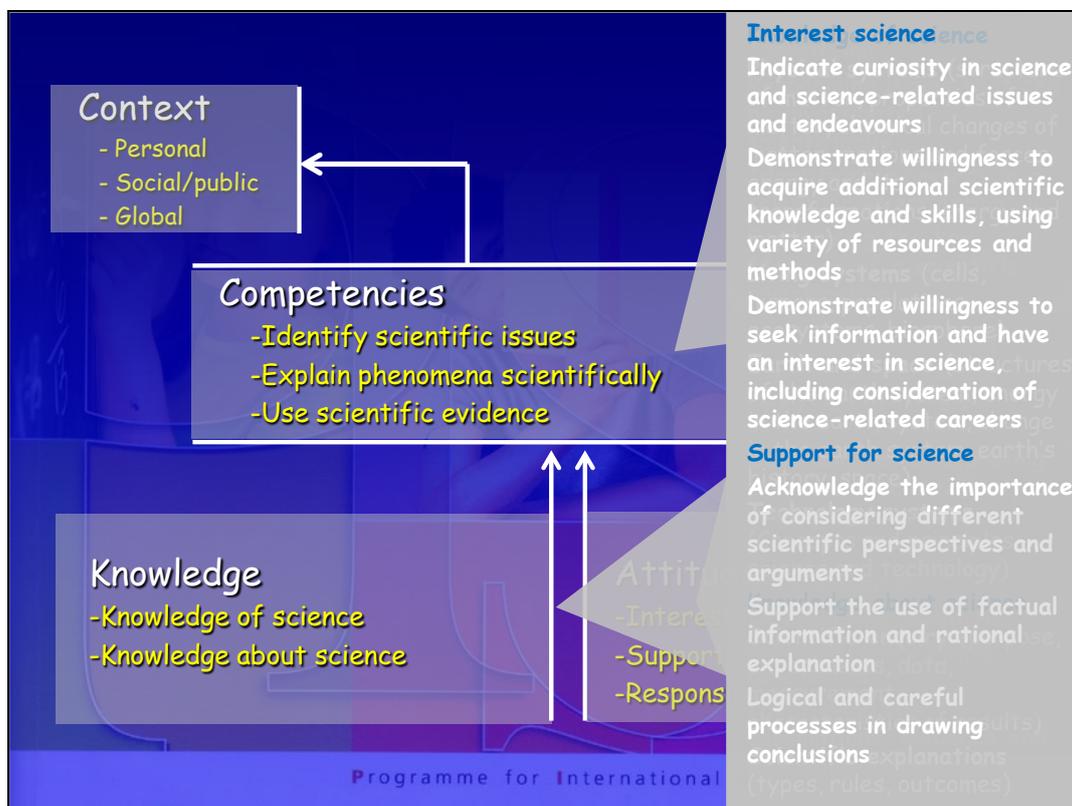
In PISA we don't tell students whether this is an algebra problem, a geometric problem, even whether this is a mathematical problem. We expect them to be able to use what they have learned, to apply what they have learned in that kind of knowledge situation. Having a mathematical number, a mathematical result is not the end of the story. What does that result mean in the context of the real problem?

This is one view of Mathematics but there are others. You can create other models. That is another way in which educational assessment can have an impact on the debate. Assessment can formulate the paradigms that you take in different subjects, and those paradigms influence the results. They influence the results very, very strongly.

Portugal is not some sort of an extreme case. We can take the case of the Russian Federation. If we had only tested within “The Mathematical world” - traditional school tests -, the Russian Federation would come out number one or number two. When you look at international tests that have done so, this comes out very strongly. When you compare them with PISA they are number 23 among 40 countries.

The way in which you look at the world makes a difference: it shapes the outcomes that you see. It’s not that PISA tells you how good or bad an education system is, but it tells you how good an education system is in a particular view of the world. So that’s one of the important ways in which results can shape the impact.

You can do the same thing in Science. In Science, as well, we don’t look just at how well students know something of Physics, Chemistry, Biology. We want to see to what extent they can identify Science in a real situation, whether they can scientifically explain what they see, whether they can use evidence. And of course this has to do with knowledge.



Slide no. 15

I don’t deny knowledge is a very important part, but knowledge also has several components. There is of course the *knowledge of Science*, of Physics, Chemistry, and Biology. What about the *knowledge about Science*, Science as a discipline? What is evidence? What is a hypothesis? What is to draw conclusions? What is to make judgements? What distinguishes a question that is scientifically investigable from one that is just a popular belief? That’s also Science, so knowledge about Science is an equally important part; it shapes competences in the same ways.

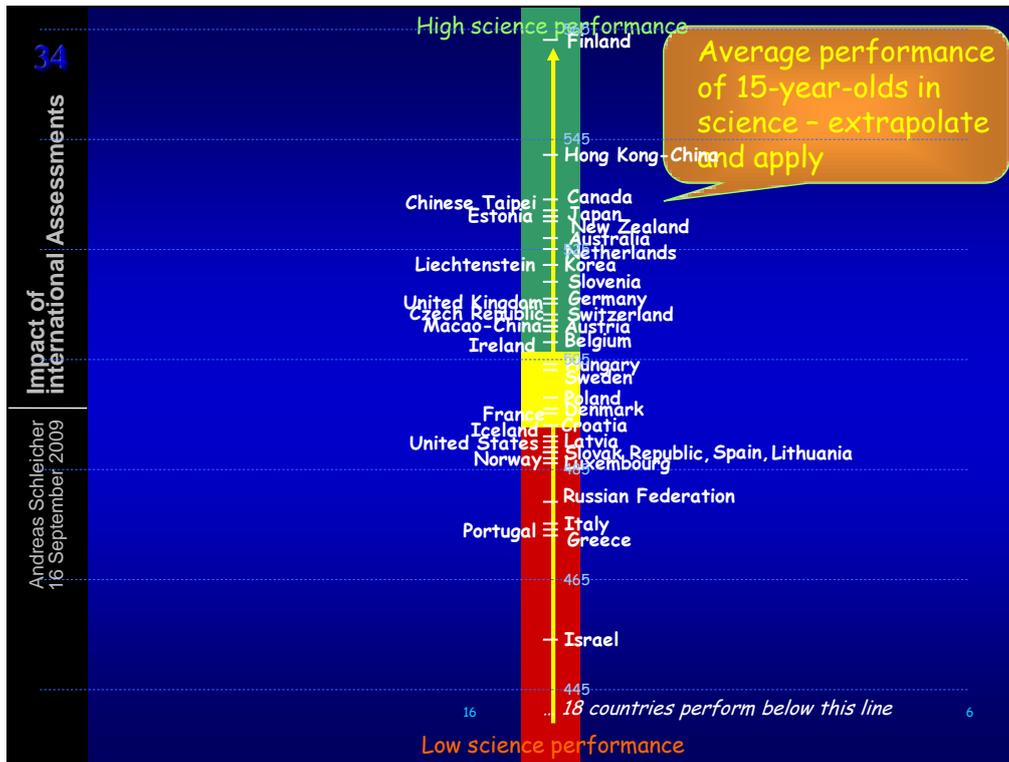
To what extent attitudes, interests, support, taking responsibility should be part of Science is a very debated question. For some countries school is about knowledge, it is not about influencing young people. Other people say ‘well, if you look at

environmental questions today, this is not just about knowledge, this is about people taking responsibility, people using Science to shape their lives, people making trades'. And of course whatever you do, you do it in a specific context. You cannot ignore this as well. Take the languages, one other language, one other view on the world.

We could talk about many of those kinds of paradigms here, but what I want to analyse is how assessments can actually shape the way we look at the world, and therefore they have a deep impact. And in some countries this impact is more important than the impact of the results. I just came back from Japan, talking at the Japanese Parliament and they are not interested in where they come out. They know they are doing well by international standards in terms of the ranking, but they are very interested in how other countries model the world; how they define the skills they need to succeed, how they measure them, how they teach them. This is also very important and of course we shouldn't neglect it.

And then there comes the results. That's what everybody tries to look at and all the media like to map countries.

Look at this slide on the average performance in science! Red are the countries bellow the average, the average is yellow, and green are the countries that are doing well by OECD standards.



Slide no. 16

Here you can see how Finland comes out on top of everyone else, but you also see some countries in Asia doing well. Canada in North America coming out with good results. We can basically see there is a range of differences here, and here you have the position of Portugal. You can look at this in two ways, you can always ask yourself, 'is the glass half-full?' or 'is the glass half-empty?' 'Why is Portugal where it is?'

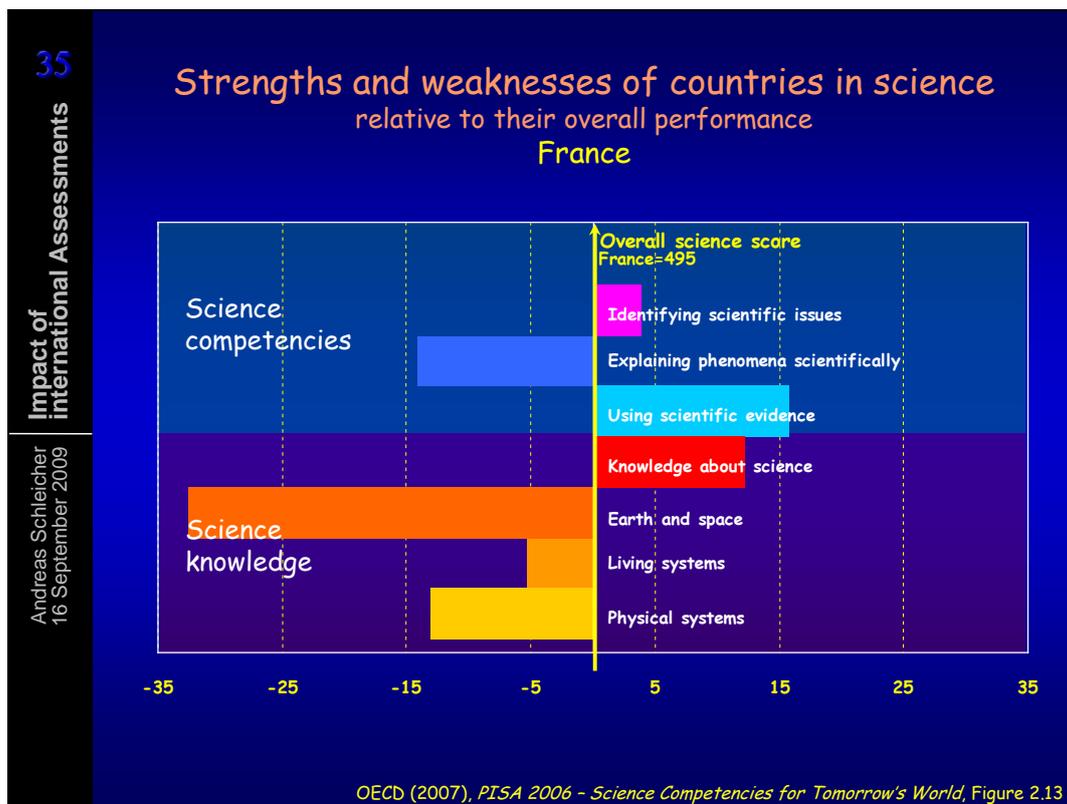
First of all, Portugal is by OECD standards one of the most rapidly improving education systems - you've seen that for higher education but I could have shown you the same chart for school education. School today is very different from what it was twenty years

ago. However, the kinds of strengths of Portuguese students are perhaps not ideally valued by the PISA systems for the reason I've shown you before. This is a challenge for Portuguese students: they are often good at the reproduction of subject matter competence, but they have greater difficulties in using their knowledge.

Once again, that's what assessments can do, that's another form of impact. They can show you where they are, where you are in terms of quality of outcome. They can also show you where you can be, and that's the important dimension of comparisons.

When you see yourself in a national perspective you do not know how good things can be in terms of quality, equity, efficiency. When you look at yourself in the mirror of what everybody else achieves you can actually look at this in a different perspective. And I'd like to show you this also in a bit more nuanced way.

Let us start with France!



Slide no. 17

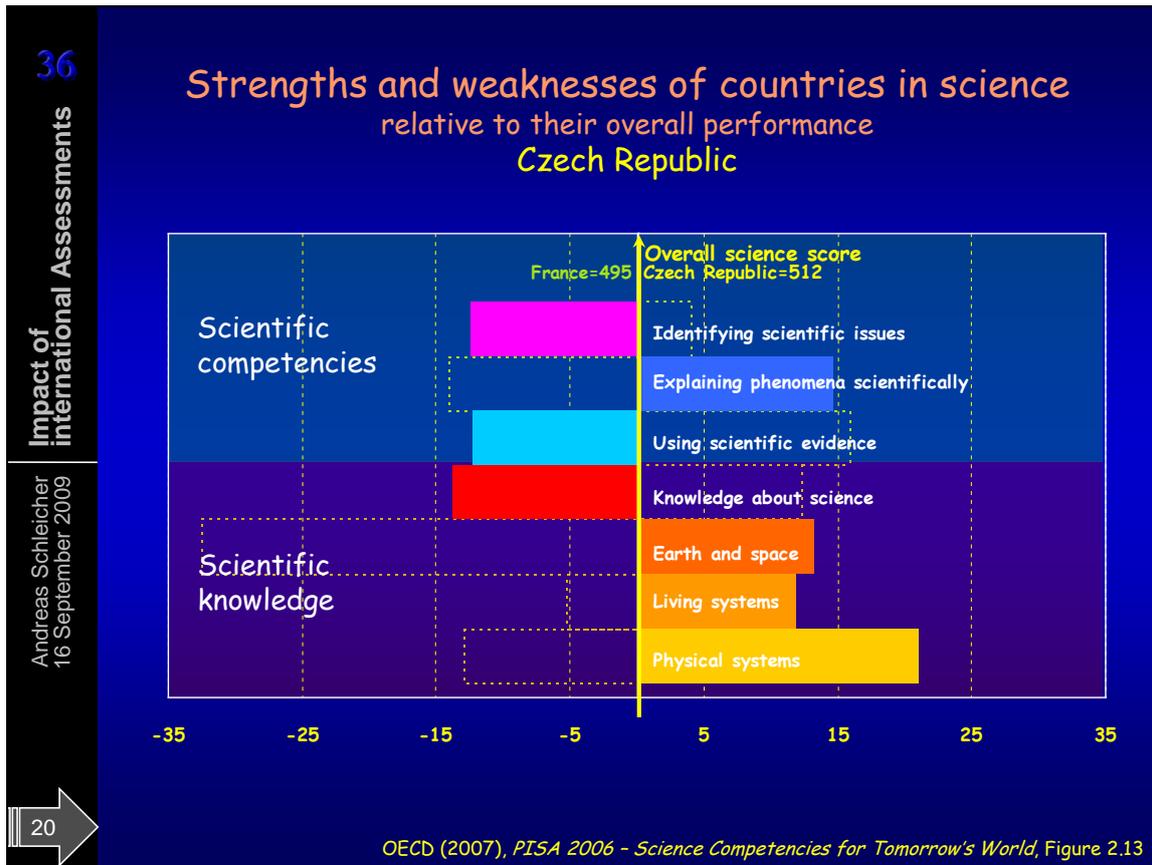
French students are average performers overall. They are sort of fragile, sort of so-so, not particularly good, not particularly bad.

Students can *identify scientific issues*, they figure out what science is, it's positive. They are very bad when it comes to *explaining what they see scientifically*. Their knowledge base is not really well developed. But they can actually *use scientific evidence*, they have very good strengths here. So basically they can think scientifically.

French students have quite good knowledge about Science, about the fundamental paradigms of Science, but they have poor knowledge of Geography, poor knowledge of Biology and Physics. So what you see here is that an average score tells you something, but the real story starts when you look at below the relative strengths and weaknesses of countries.

When you look at this pattern you can ask yourselves, "Does every country look like that? Is every country similar?"

Let's take a typical Eastern European country, Russia or Czech Republic for instance.



Slide no. 18

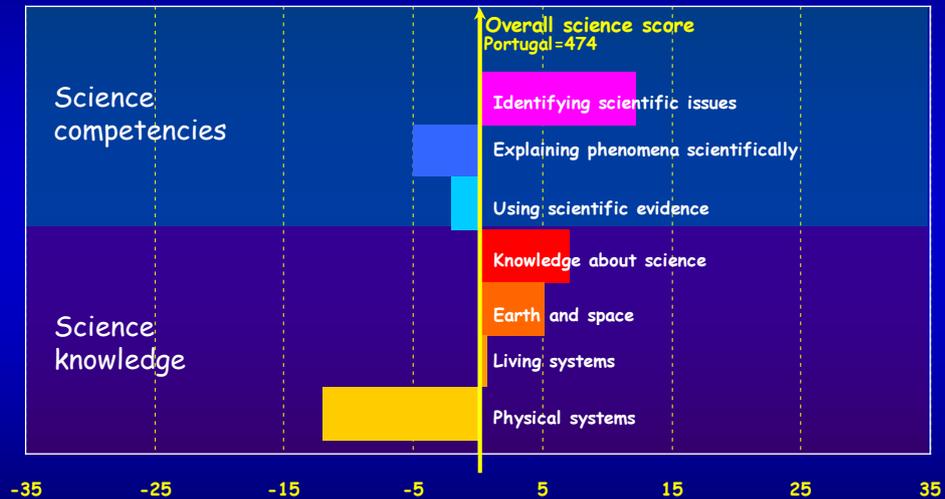
If I contrast France with the Czech Republic, you can see it's almost exactly the opposite. On average, the French and the Czech Republic do quite similar. But the kind of relative strengths and weaknesses of their education system is very different. This tells you that what you have in your curriculum really maps the outcome, how you teach, what you teach. It does make a difference.

Maybe not in average, but in terms of the relative strengths and weaknesses, if you compare France and Czech Republic, I think I know where I would hire an engineer and where I would not, in terms of the relative strengths and weaknesses of the education system. Czech students are not very strong about understanding what Science is, but they do have a very solid quality of knowledge.

Where would you expect Portugal? There you are, a more mixed picture, but not as extreme.

Strengths and weaknesses of countries in science relative to their overall performance

Portugal



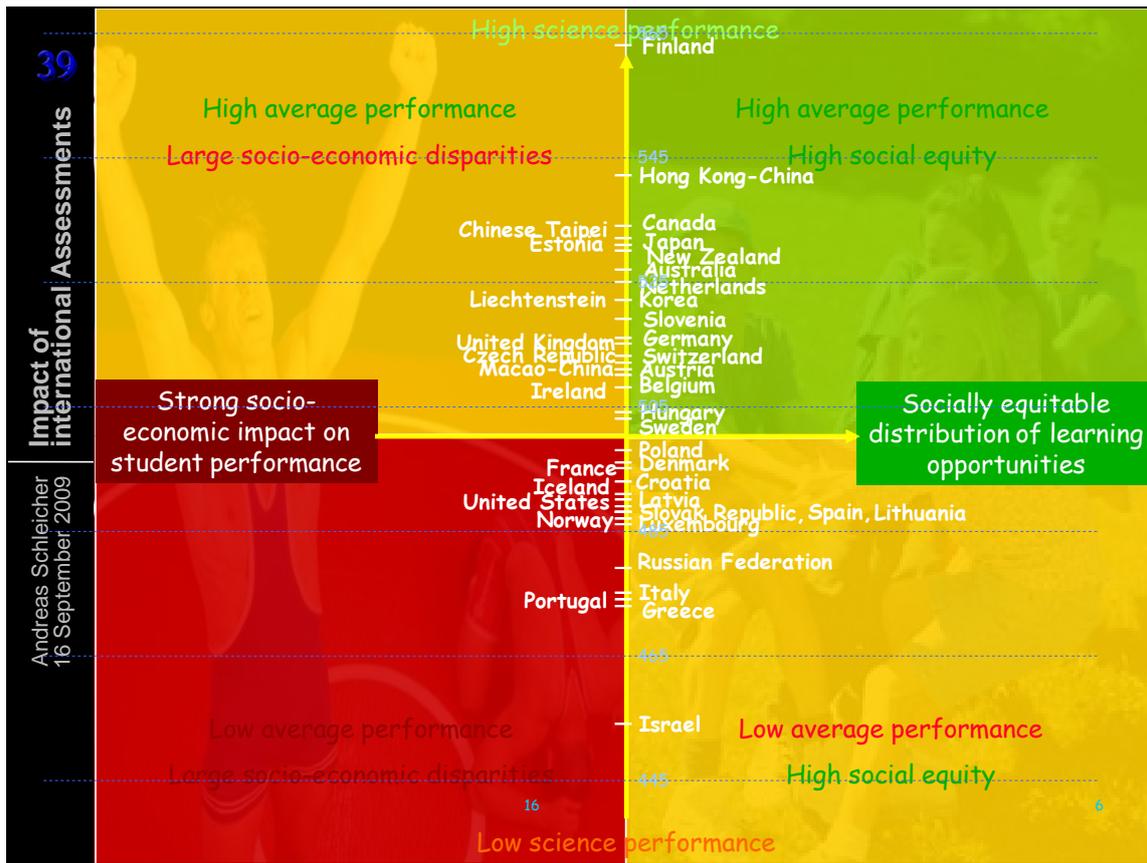
OECD (2007), *PISA 2006 - Science Competencies for Tomorrow's World*, Figure 2.13

Slide no. 19

International assessment, what is the impact? They tell you not just how good things are but they tell you what the relative strengths and weaknesses are.

How do you evaluate your national curriculum? Well, one way is to look at how systems come out across different student groups.

I will now introduce another dimension, which your minister spoke about as well and which is very, very important to the OECD. That's the dimension of equity.



Slide 20

Assessments are not about results, they are also about how well results do materialise for different types of students.

In some countries you can say that the impact of social background on learning outcomes is very, very strong. What this means is whether you come from a rich or a poor family matters a lot for the success of your children. But international assessments also tell you this is not true for every country.

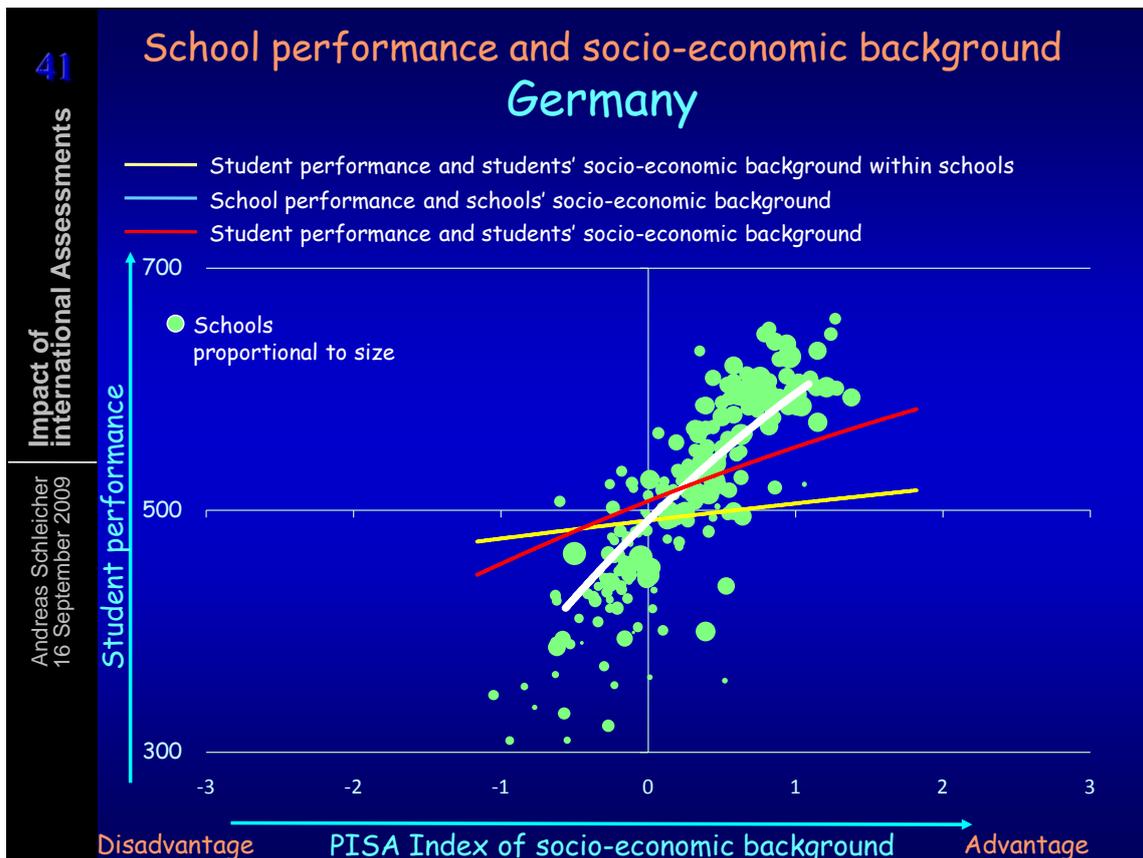
Some countries do really well in moderating the impact of social inequalities. So you have again not only differences on the vertical axis in terms of quality, you do also have big differences in terms of the horizontal line. Everybody wants to be where the results are very good and the impact of social background is very small. This is the problematic area where results are not so good, and the impact of social background is very, very large. And that's not just a social question, that's also an economic question. When the impact of social background on learning outcomes is strong, it basically tells you that societies do not use their potential. There is a lot of human potential that isn't effectively utilised.

The green and red quadrants above are clear, nobody argues about this. It's harder to think about the quadrant *High average performance – Large socio-economic disparities*. Some people argue, “well, you know, in order to do well on average, you have to accept large disparities”. And it is also hard when we come to the quadrant *Low average performance – High social equity*. Here people say, “well, you know, better focus on equity and accept mediocrity.” Other people believe there is a trade between quality and equity: You can only maximize one and you will lose on the other. If that were true you would find all countries in either the left yellow quadrant or the right yellow quadrant. But the reality isn't like this.

In France, very much the same story, even worse. On average they are doing ok but the impact of social background is very large. The United States... Portugal is not alone on that sort of dimension, there are many countries struggling. But you also can see there are many countries that are really very successful, the Nordic countries, Japan and Korea in Asia, Canada in North America, very, very successful.

So again, international assessments can set the ambition of what is possible, what we can strive to, what we can achieve.

And I just wanted to highlight a bit of what we have learned about.



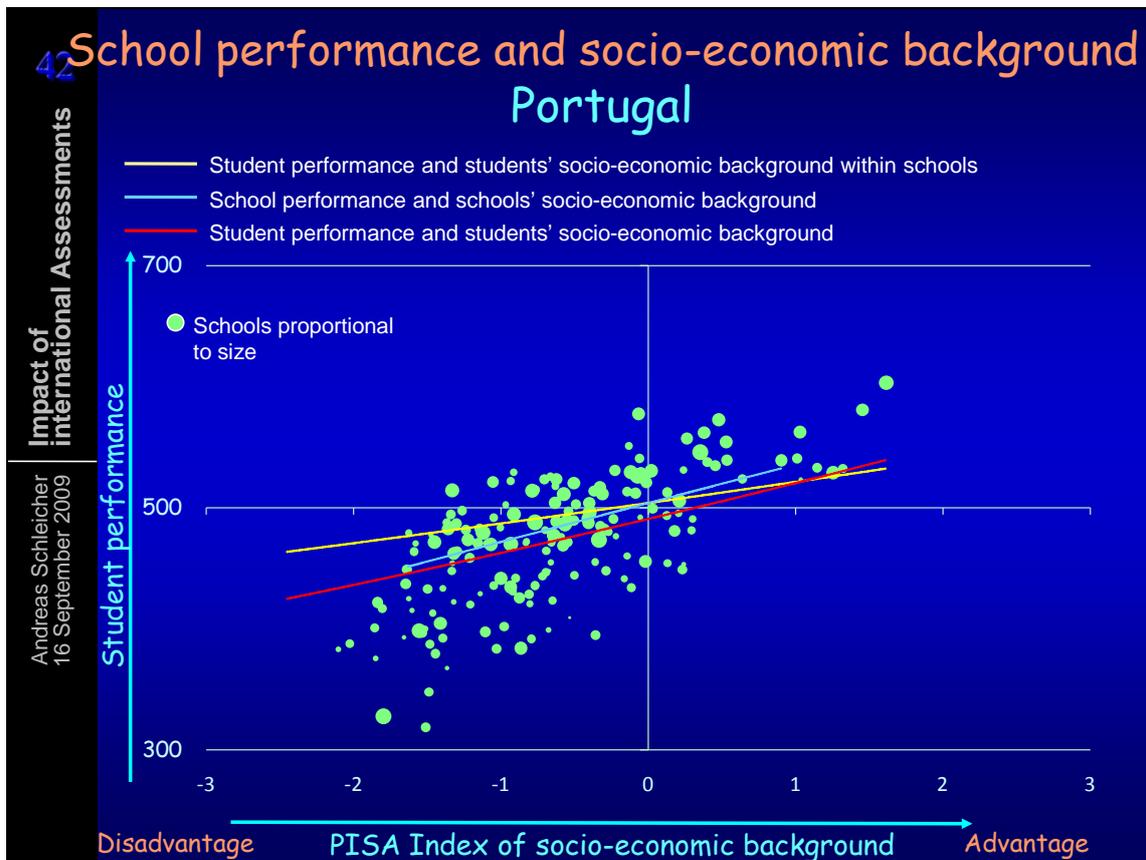
Slide 22

That is my country. You can see the social background in the horizontal axis and the student performance on the vertical axis. Every dot is one school that has been assessed, the bigger dots are the bigger schools, the smaller dots are the smaller schools. And you can see how strong the relation is between social background and learning outputs. If we come from a privileged family we end up in a school that does really well.

The question is 'why? Why is it like this?' And again international assessments tell you something about it. Some people say it is all to do with families: Poor families don't spend money with their children, they don't have education and rich resources and so it's all to do with families.

You can actually estimate that. The yellow line shows you the impact of family background on learning outcomes inside a school. And as you can see, yes, there is some relation. Children of poor families don't do as well as children from richer families, but this line doesn't explain what we see. So you can't blame parents for all of it. The big part in the case of Germany comes from the school system, so basically international assessment tells you that's something public policy can do about. Most of

the social and economic disparities observed in the case of Germany are attributable to the school system, not to parents.
Let's look at Portugal.



Slide 23

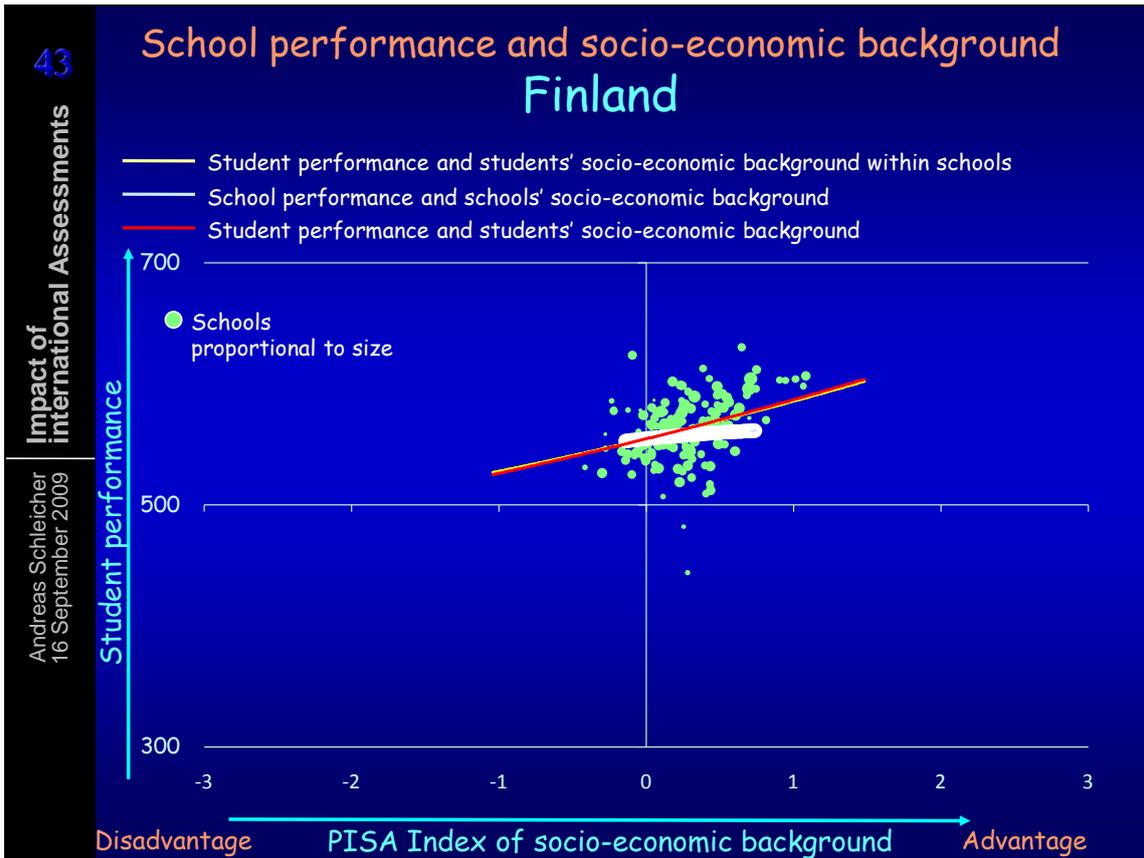
The first thing that strikes you for Portugal is that the dots are much more scattered. What does it tell us? It tells us that there are actually many poor schools from poor families that do really well and there other schools that are quite disadvantaged by Portuguese standards and the OECD standards that do not so well. And also have some schools from privileged backgrounds with so-so results.

So, social background is not a guarantee for success, it is of course a strong determinant, but the cloud is quite scattered. You can also say for Portugal that the yellow line is flatter than the blue line, which tells you that the school system tends to reinforce social disparities.

Ideally we hope that education becomes a big equalizer. Ideally we sort of expect from education that it helps students from social backgrounds to move up society, but that's not what the reality shows. The reality is for Portugal and for Germany that the school system tends to reinforce social disparities.

Does it have to be like this? Again, this is the power of global assessments.

Look at Finland.



Slide 24

The yellow line, ignore the red line, the yellow line is like in Portugal. Finnish parents are not magic parents. If you have a poor parent, you end up with a child that does a little bit worse. If you have richer parents, children tend to do better. The yellow line is exactly like in Portugal.

What distinguishes Finland from Portugal is the blue line. In the case of Finland it's absolutely flat. If you have a child from an immigrant background, from a poor social background, you can put that child together with children of other similar situations and the school will address it, the school will help you with your child's development.

If you do that in Portugal or in Germany or in many other countries, France and so on, they don't do that, they will try to put your children in the most privileged school to be cared, in order to benefit from their neighbouring social context. Very important results! Basically assessments can actually influence how we look at the world, how we look at the outcomes and what is possible to achieve. Finland is a very far remote country, and so on very special social circumstances, but in a way it tells us what's possible. And what's interesting is that most of the East Asian countries are very, very similar.

44

Impact of International Assessments

Andreas Schleicher
10 September 2009

OECD

How do we know that we found it?

The challenge of external validity

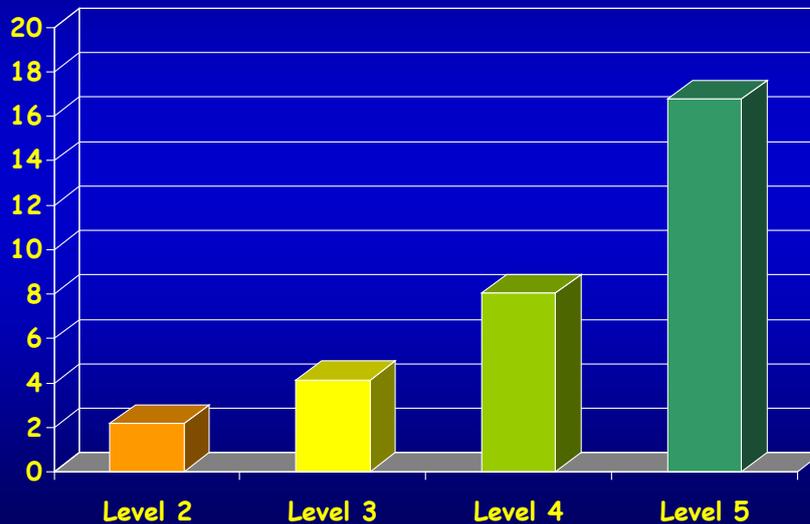
Slide 25

Of course there are some questions to be asked: Are quality and equity attainable goals? Do we measure what matters for people?

One important way to know how education assessment can influence the world is actually by looking at competences that matter for people. *How do we know that we found it?* How do you know that what you teach today is going to really help students in their future? How do you know that what you test today is shaping their future?

One way to do that is looking at what happens to these children later in their lives. And we have done that. We have done it in Canada. We've actually followed the students since the age of 15 in the year 2000 up to now and we'll continue to do that for another 15 years. So we can see what impact the PISA skills had at the age of 15 and what impact their attitudes had on their future lives. I will show you this, with some results.

Increased likelihood of postsec. particip. at age 19 associated with reading proficiency at age 15 (Canada) after accounting for school engagement, gender, mother tongue, place of residence, parental, education and family income (reference group Level 1)



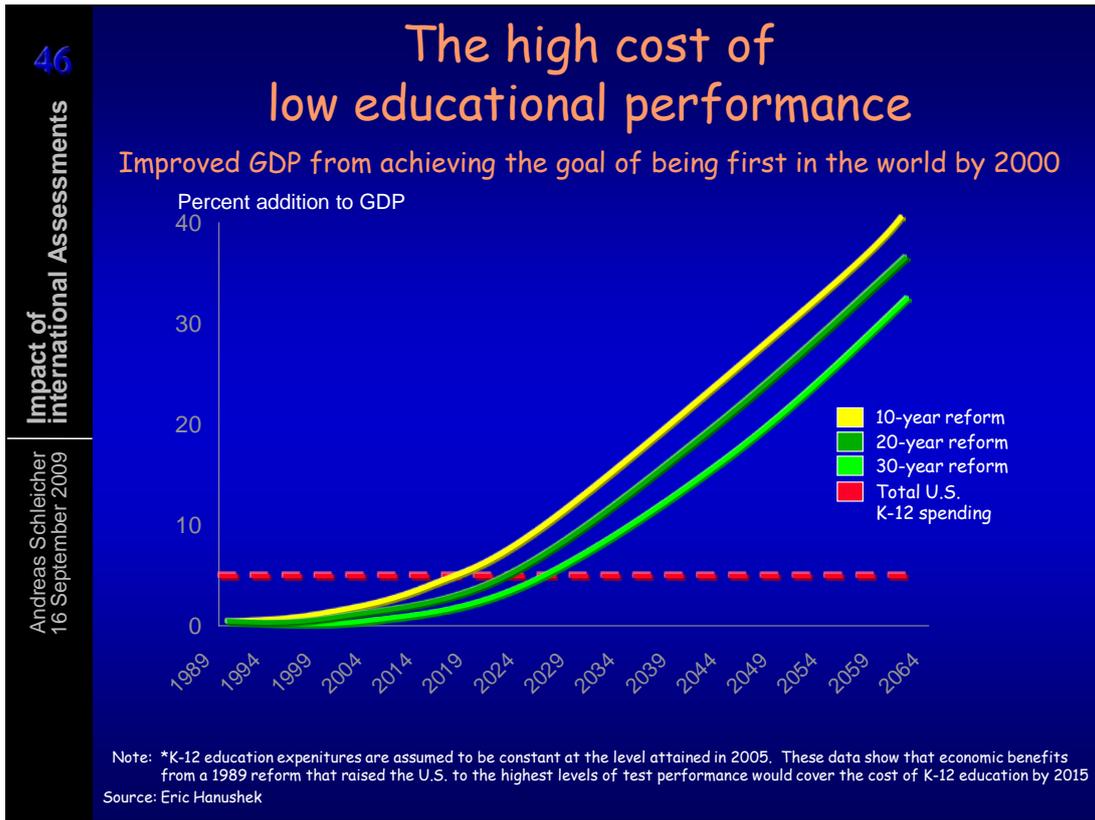
Slide 26

This is the example of Canada. It is very expensive to do those kinds of long studies, we don't have them for many countries, but we have them for some.

This is at the age of 19. The people we tested when they were 15 years old in the year 2000 and who had achieved level 2 on the PISA test were by the age of 19 twice as likely to have moved on to higher education or a successful job. And this is after accounting for all social background factors, this is the real impact education has, it's the PISA skills; the people who had achieved level 3 had four times more chances to have moved on; the people who had achieved level 4, who were good readers in the year 2000 according to PISA, were eight times as likely; and the people with level 5 were sixteen times as likely to be successful in terms of education paths, of career paths.

Now what does this tell you? It tells you, on the one hand, that the kinds of skills that PISA measures, at least in Canada, are really important for the success of people: An odds ratio of 16 to 1. Doing well really matters for your future career. The other way of reading this is, "well, what you haven't achieved by the age of 15 is very, very hard to accomplish." You can also look at this in a way of telling yourself, "well, you know, what you haven't learned in school you can pick up later in life, there are lots of second chance opportunities." But that's not what these data tell us. What people didn't acquire by the age of 15 is very, very hard to achieve according to the probabilities.

You can do the same thing for economies. You can look at the long term impact of skills, in terms of economic output, and you will see the same picture.



Slide 27

You can see that basically the added level of economic output from improved performances on assessments on PISA is just very, very huge.

If the United States in the year 1989 would have actually done what they said... By that time they said, "we are going to become the best education system in the world..." If they had achieved that, by the year 2040 the added economic output would have paid for the entire education system. The education system would become an asset rather than a liability. By the year 2059 we would talk about 50% of added GDP with improved education performance. Again that's another way assessments can shape the world.

But I want to come to the last part of my presentation which is usually attributed great importance.

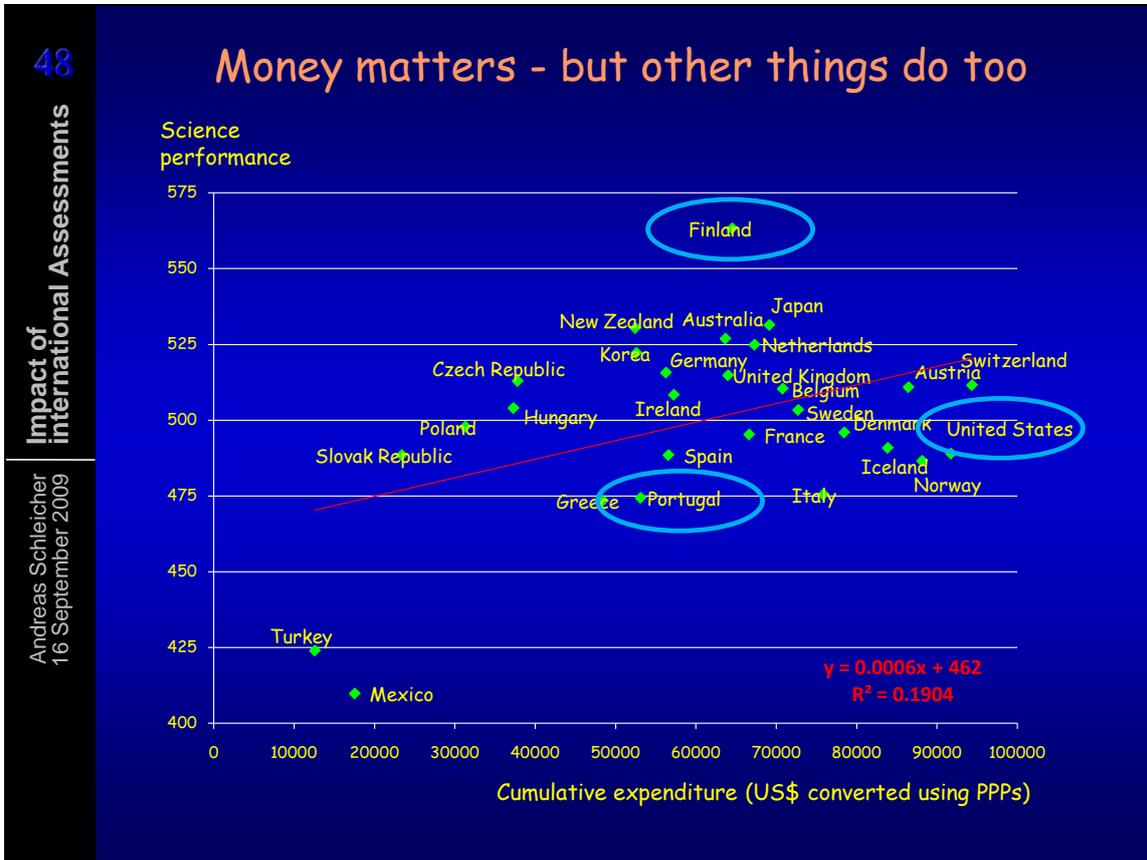
47
Impact of international Assessments
Andreas Schleicher
10 September 2009

What do we do with the results ?

Understanding what contributes to the success of education systems and improving performance

Slide 28

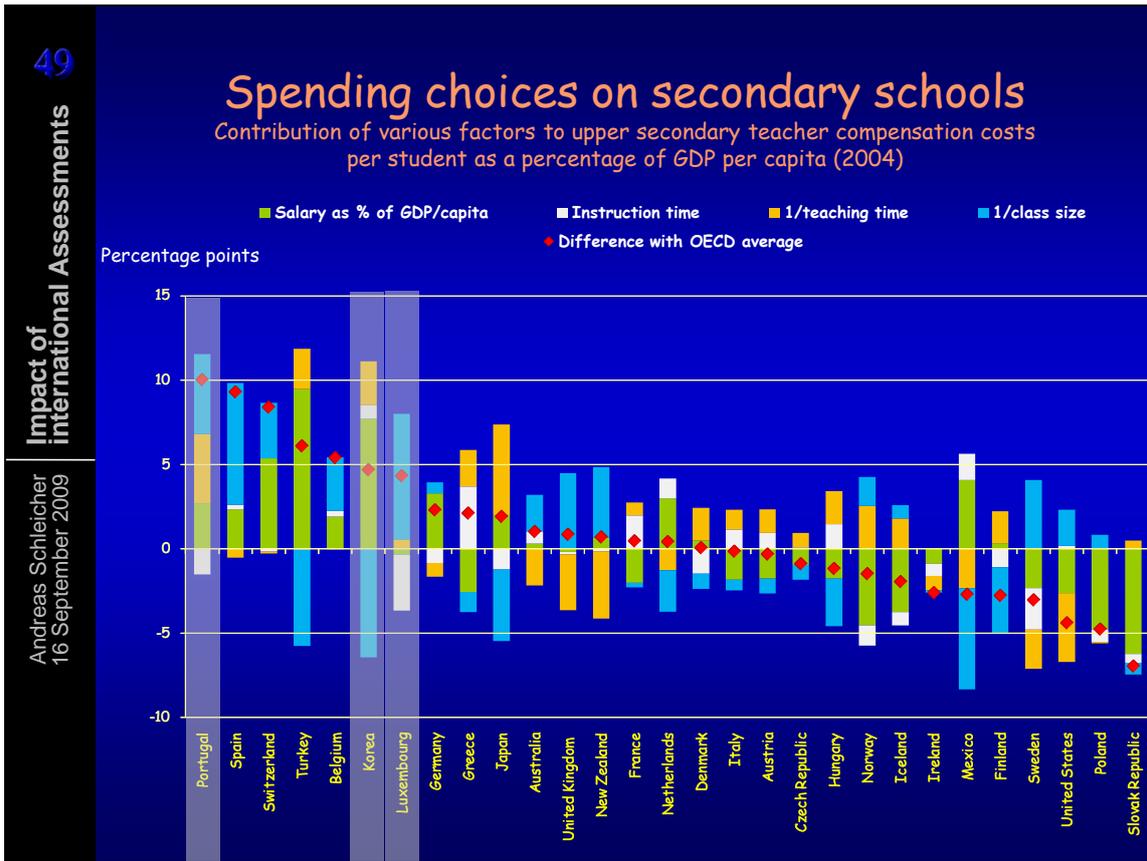
How do we understand what contributes to the success of education systems? What are international comparisons really about?



Slide 29

The first thing we need to think about is that money is important but not everything. The relationship between spending per student at the age of 15 and outcomes... you can say there's some relationship but you can see that some of the best performing systems are not spending very much, and some of the highest spending countries don't do particularly well. So money is no guarantee for success.

How do you spend your money is much more interesting. And I will show you this because the results for Portugal are very interesting.



Slide 30

When you look at spending per student in relation to GDP per capita, we find Portugal number one. In relation to its spending capacity Portugal actually invests a lot in education. No country in the OECD invests more per student relative to spending capacity.

How do countries spend their money? It's another interesting question, not what they spend or how much, but how they actually spend it. One way you can spend a lot of money is by paying teachers well.

Look at the example of Korea. Korea, remember it is one of the best performing systems, puts a lot of money into teachers' salaries. They try to pay teachers really well, in relation to spending capacities. That drives the costs up, of course.

How else can you spend money? Instruction time. The longer you make school days, the more you end up spending. And you can see also that in the case of Korea, that's more to spend. Students in Korea go for many hours to school per day; it costs a lot of money.

You can also spend money by giving teachers time to do other things than teaching: Professional collaboration, curriculum development, things like this. Korea does that as well. So you can see that's the bill they would have to pay if all those factors would matter.

It is a very, very expensive education system, but in reality they only spend that much. So, how do they save money? The answer is class size. They basically say, "We want to get the best people into teaching, we pay teachers a lot. We want that students have lots of opportunities to study, many hours. We want to make sure that our teachers continue to learn. We give them lots of opportunities for professional collaboration. All of this drives up costs, and how do we pay for this? With large classes!"

Luxembourg spends as much as Korea. But in Luxembourg parents and teachers like small classes, everybody favours that, that's what's driving costs up. Luxembourg pays a huge bill for having very small classes. And what does it mean? It means there is very little time for instruction, short school days, they can't pay their teachers well by relative standards, and they cannot give their teachers any time to do things other than teaching. So what I am showing you here is that for all the things that you do, there is a cost associated.

Why is Portugal so expensive? Not because students have long school days, they have relatively shorter days than everybody else in other countries, but teachers are quite well paid, teachers have time for other things than teaching, class size is driving costs up as well. So in Portugal all of those things add up.

International comparisons can tell you a story about how you spend your money, in comparison to anyone else.

What is the ideal class size? People argue about this for decades. What is the ideal teacher's salary? Who knows? But you can see actually how everybody else is spending their money. International comparisons cannot tell how Portugal should be doing, but they can tell Portugal what everybody else is doing.

Yet, money is not the only thing. International comparisons also show us some of the other factors that drive performance.



Slide 31

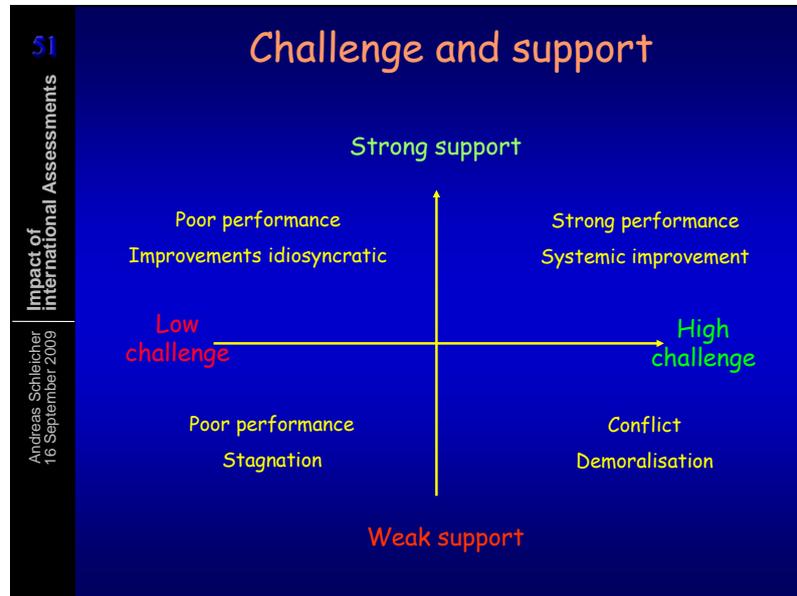
The first thing you notice when you look at outcomes from PISA and you look at the countries doing well, most of the countries doing well have very *clearly articulated ambitious standards*, universal standards for all students of what good performance is.

Finland doesn't have a very detailed curriculum. They don't tell teachers what to teach. But they are very clear about what good performances in Mathematics, in Science, and all of the other subjects. They tell teachers what students should be able to do, as opposed to telling teachers what they should be teaching.

Combined with this and with the ambition system, there is also the capacity of a system to get the best people into teaching: how do you attract the brightest people into teaching? How do you make sure that teaching is an attractive profession? It has to do

with money - we have just seen that - but not only. In some countries teachers are paid quite well, Portugal is also one of them, and still they find working conditions that are not as conducive as they are in other countries.

So it's the combination between the challenge and *support* that assessments tell us does matter.



Slide 32

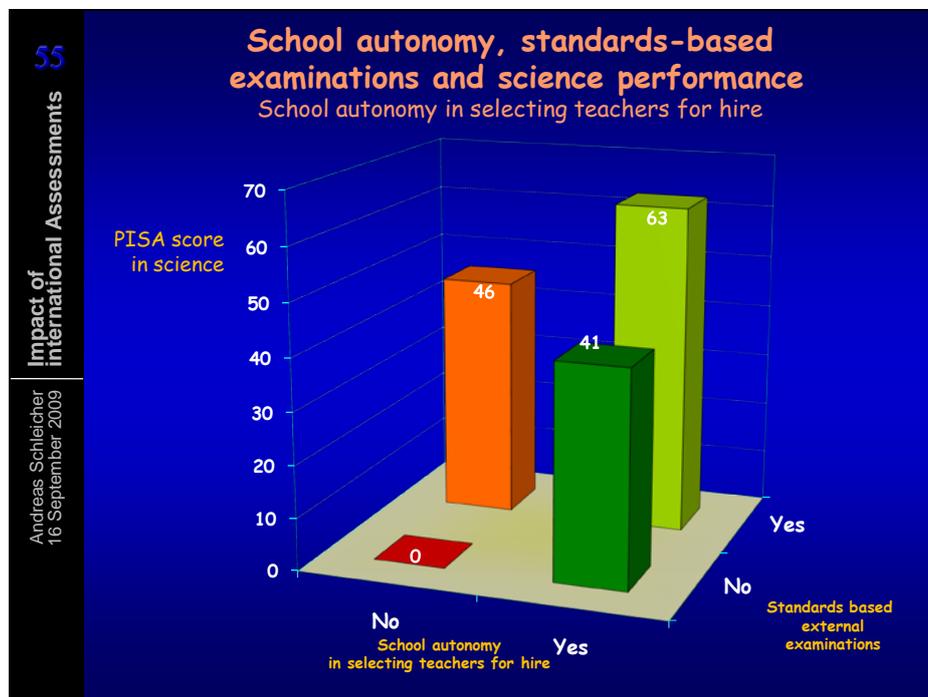
When you have low ambitions and weak support systems you don't expect very much. I think that's pretty obvious. Raising the challenge is a very favourite thing in some countries, you just make more ambitious standards, you make more demanding assessments, you assess more frequently and so on. These are things that are easier to do, but if they are not backed-up by that kind of support, you don't achieve that much. We have actually lots of good experiences across the world from those kinds of policies. We have studied other countries like Denmark and Norway. They have very strong support systems, wonderful ways to support their people, but they are not very ambitious. They are not clearly articulated in what good performance is. And as a result some schools are good and other schools are not that good. So, according to our analysis, what really makes a difference is a combination of strong support and high levels of ambition. That's something that comparisons can tell you across countries: factors associated in a system.

There is another dimension that is very important.



Slide 33

We see, for example, that in most systems doing well there's a lot of responsibility on schools, schools have a lot of room to manoeuvre, but at the same time systems know how to intervene otherwise if necessary. I mean, systems do know when a school fails to have the capacity and the means to intervene. I'm going to show you this with some data.



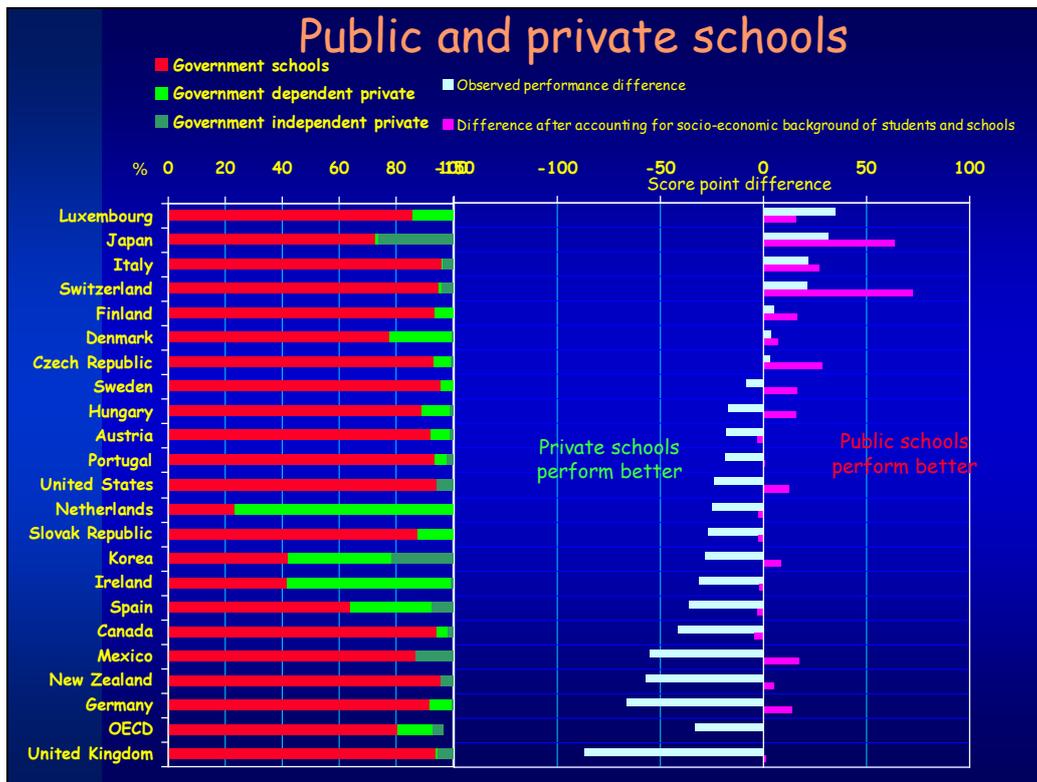
Slide 34

You can measure school autonomy in many ways; it doesn't really matter for the purpose of this analysis. Here I've just measured whether schools have an influence on whom they hire as teachers and to what extent the system has some kind of external

reference framework for performance. And on the vertical axis I show you the PISA difference.

What does this show you? Schools that have very little autonomy and no external reference for performance tend to be the worst performing schools. Schools that have no autonomy but they do operate on a clear framework of external standards come out 46 points higher and that's more than one school year advantage. Schools that have a lot of autonomy but no external frameworks are often private schools and come out 41 points. But the biggest price comes with what you've seen before, with the combination of local responsibility and at the same time an external framework of standards.

I just want to make sure that this is not misunderstood as a plea for private schooling. I mean, local responsibility has nothing to do with private schooling; in fact every public school in Finland has more room for discretion than any private school in Portugal.



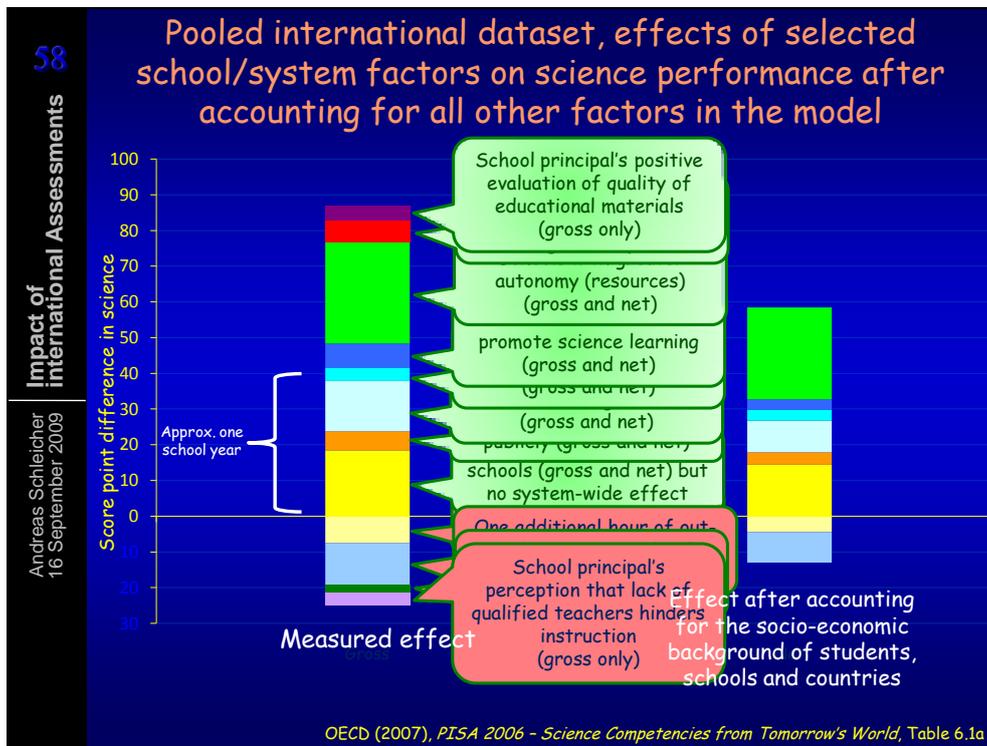
Slide 35

So basically this is not an issue of who runs the school, but how the schools perform. When you look at the results, you can see that in most countries private schools do a bit better than public schools. It's the bottom line performance. But when you account for the social composition of the schools you can actually see there's no performance difference left.

So again what I am showing you here in terms of local responsibilities is not to do with who runs the school but with how the school operationalizes its degrees of freedom. In fact, there are some countries where you can see quite a big performing advantage of public schools. If you look at Japan or at Switzerland, for example, public schools do quite a lot better than private schools after accounting for social background in particular.

Just to look at the slide below, at what we have learned from international assessments, when you take all the school factors together.

Measured effect is what we see and *Effect after accounting for the socio-economic background of students, schools and countries* is what we would have seen, if all students, all schools, all countries would be equal.



Slide 36

You can see that *schools that group their students by ability*  usually don't do so well, that's something that drags on the performance.

But when you have *schools on average, across countries, being academically selective* , they do better. That's very clear: if you can select your students with an entrance test you have an advantage, and that is true before and after accounting for social background. You may wonder, "Well, you know, that seems a good trick, to make every school selective. What if you make a school policy a system policy?" And then you can test it. We will actually see there's no system with effect left, so that's not so important.

This is a very controversial finding; *schools that post their results publicly*  typically come out better.

This is also important, *one hour of Science learning per week at school*  has quite a big performance advantage. Some people say, "You know, it's not quantity that matters, it's quality." It's true, but at the end of the day the outcomes are the product of quality and quantity. And you can see quantity alone has quite a big influence on outcomes: one hour of Science learning at school in terms of Science performance.

Out of school learning  has negative impact, but I think that's just a selection effect.

One hour of self-study or homework  also has a positive effect, but it's much smaller than what schools can achieve. Why is that important? Because of course the most precious resource in education is the student's learning time. It's the only thing you can increase. When you spend that hour at school you get a lot, when you spend it out of school you get little. So, both are positive but in very different ways.

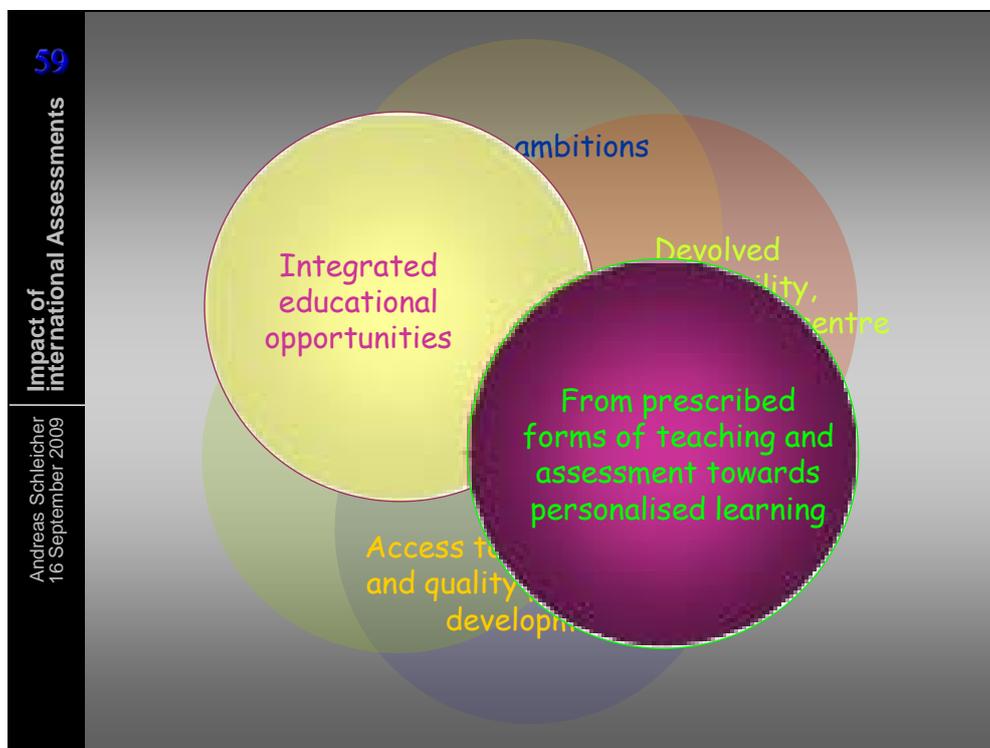
School activities to promote Science learning [blue box]. Here you can see schools that did more than just teaching: in Science competitions, Science exhibitions, they have brought science to life. You can actually compare to tell you that this actually is already a positive outcome.

We already talked about *autonomy* [green box], it's a big factor influencing results.

The rest of the factors are relatively small and they don't usually come out in the model *Effect after accounting for the socio-economic background of students, schools and countries*, so I'm not going to talk about them.

What you see on the above chart is almost worth two school years. You get all those factors right, the most successful schools are two years ahead with those kinds of combinations of factors.

Finally, and with this I want to conclude, we do see that success is associated with systems that are highly inclusive, highly integrated, and that at the same time combine this with access to high level of personalised education.



Slide 37

It's not just putting all students together, doing the same thing with all students, but it's about working in an integrated system in a highly individualised way. That's what we see, and we see that happening in some countries even with large classes, where we ask students for example, "do you perceive that your teacher understands what you could do?" "Does your teacher support you to help you achieve your maximum goals?"

In some countries, even with large classes students respond very positively. In other countries even despite small classes, students don't perceive them to be an individual, they perceive them to be one of many in the class. And those things seem to be mattering, at least in the perception of students.

And I want to show you this; it's my last slide.



On the vertical axis you see again the quality of outcomes, we've seen that before. On the horizontal axis, equity. And now you can simplify this and you can divide systems into two types: High degree of stratification and low degree of stratification.

How do you deal with the variation of student's performance? There are two philosophies. One philosophy is, and I mark this in green, that you basically have a very open education system, highly inclusive and it's the teacher's responsibility, the school's responsibility to constructively engage with this diversity, to personalise learning. Marked red are those education systems with a lot of what we call stratification in the system, those which say, "well, we deal with variation through the system. If students haven't succeeded, we let them do the same thing next time with another teacher. If students don't do well, we put them into a vocational school".

I mark the inclusive systems in green and the stratified systems in red. And you can see that on the vertical axis, maybe the distinction is not so clear, but on the horizontal axis the distinction is very clear.

The more stratified an education system is, the greater the impact of social background on outcomes. Systems are not so good in selecting students by their academic potential, but most school systems are very good in sorting students by a social background. It's different. And that's true for Portugal as well, and you'd tell me, "Well, how can it be? Portugal has a very sort of standardised education system."

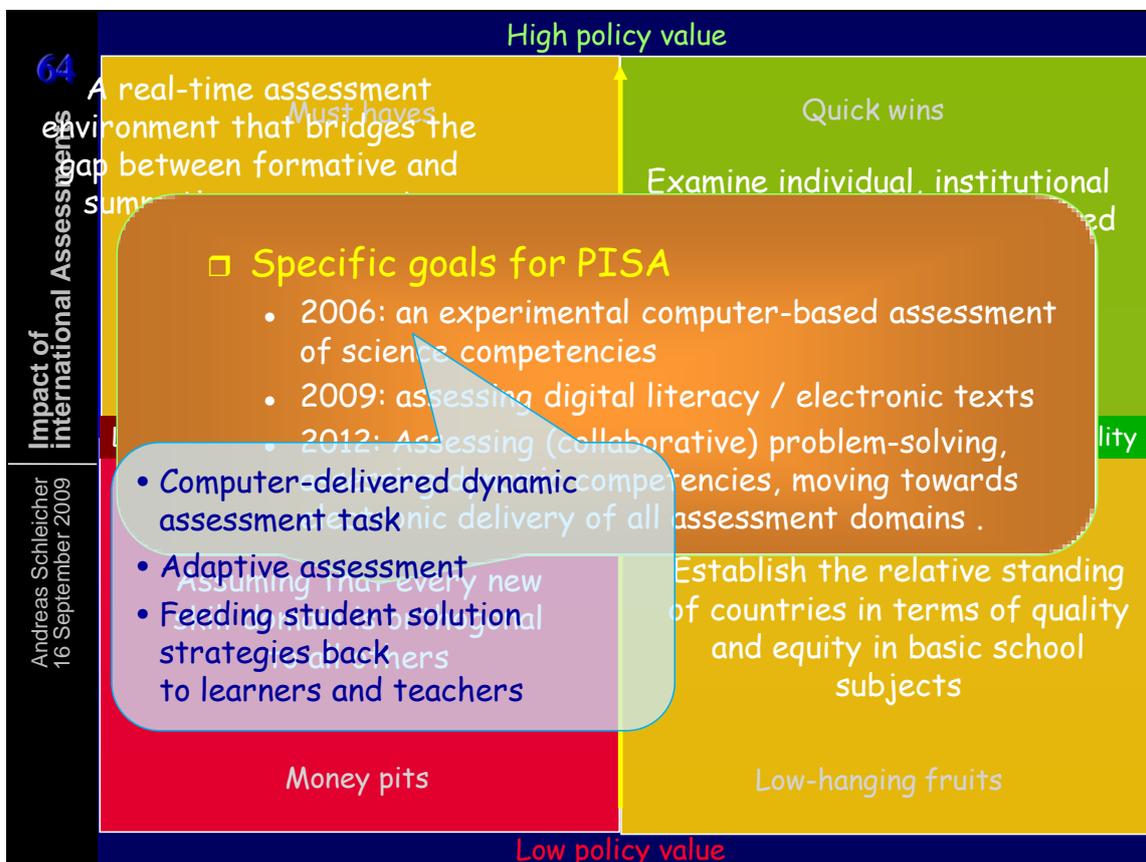
Well, in Portugal that kind of stratification very much comes with great repetition. A lot of students repeat year after year and many students for more than once. We can see that in the PISA results. And usually that is also a social divider. We can see that very clearly associated with the impact of social background on learning outputs. Not just in Portugal.

And, by the way, it's a very expensive way of addressing problems. And we can say for example that the educational cost for a great repetition is not very large: we just put that student into another classroom and you have one student more in the class. But if you think about the social cost, we've estimated that cost of one student repeating one year being about 15 to 20.000 euros in OECD countries. Assume Portugal at the lower end of that spectrum; 15.000 euros being wasted by a student repeating one year more.

What does Finland do? Finland doesn't spend that money the same way, it gives that money to the school. Schools can devote 30% of their instruction time to learning outside formal classes. Schools have a lot of resources where they can basically identify problems, get students into a special class, put them back into their classroom, devote a lot of resources: social resources, educational resources for the students. And the money they spend for this is less than what Portugal loses in terms of high repetition rates.

Finally, what we see here is that tracking stratification always works against equity in systems. It's quite consistent across countries with very, very few exceptions.

With that I want to conclude the presentation.



I just want to give you one more picture of our future in the context of PISA. Where do we see the future of assessments in terms of the value for policy, in terms of what we believe we can do, there are also things we want to do but not everything that we do.

Of course we want to do the things that are important, that we can do. We don't want to do the things that are difficult to do and maybe not so important. Assessment must have the ambition to move the agenda forward to do some of the things that are hard to do but very, very important for public policy like assessing the kind of competences we are

not able to capture today. And of course we always pick up some things that are maybe not so difficult to do but not so important.

This is what I've shown you that we can actually do quite well: *examine the individual institution and systemic factors associated with high performance*. Today we can account for about 70% of the performance variation of schools across countries. We know what factors are associated with success. We know nothing about the cause or relationship, that's not for PISA to solve, but we have a quite good idea.

Monitoring educational progress is very, very important and hard to do. People tell us "why is it so difficult? You just repeat the same test." Yes, but who wants to know in the year 2020 what was important in the year 2000? The kind of skills that matter change and so keeping that balance between innovation and continuity is a very tricky challenge for us and for everyone. *Establishing the relative standing of countries in terms of quality and equity in basic subjects* is not such a problem.

Measuring growth in learning - one of the things that are most important for teachers - is where we are knowing very little as much on how well students do, but how they are progressing. When you get a student at a primary school, what do you know about that student from early childhood education? When you get a student at secondary education, how do you know what the learning difficulties of that student were earlier?

Extending the range of competences through which we evaluate quality is very, very important. Assessment still is a very narrow perspective. We focus on things that are easy to test, not always on things that are important, extending, that is important. And we have a lot of things in PISA on the way to improve that.

And then finally, the biggest prizes will come to building *real-time assessment environment that bridges the gap between what we call summative assessment and formative assessment*. How do we actually connect what you do with PISA with what is happening in classrooms and build those kinds of bridges? That's the sort of picture of where we see the challenges for assessment in itself, but the real message I really wanted to convey here is that we know that some systems are very successful in quality, equity and efficiency, and we can understand many of the factors that relate to the success of these systems.

So the assessment can influence our thinking in terms of understanding and learning from other systems. It can influence our thinking in terms of the kind of competences we want to value in our society and compare it to others, and things like this. Thank you very much.