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The PISA-syndrome – How the OECD has hijacked the way we perceive pupils, schools and education

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From the mid 1990's, the OECD started the planning of the Program for International Student Assessment, now well known as PISA. [1] The first PISA testing took place early in 2000, and the results were published in December 2001. Since then, PISA results have gradually become a kind of global "gold standard" for educational quality, and educational policy has been globalized, lifted out of the domestic policy, as proudly stated by the PISA director, Andreas Schleicher in the TED-talk quoted below. The presentation is transcribed in 29 languages and has been seen by some 758 thousand viewers.[2]

[1] This essay is partly based on Sjøberg (2019).
[2] Schleicher, 2013.

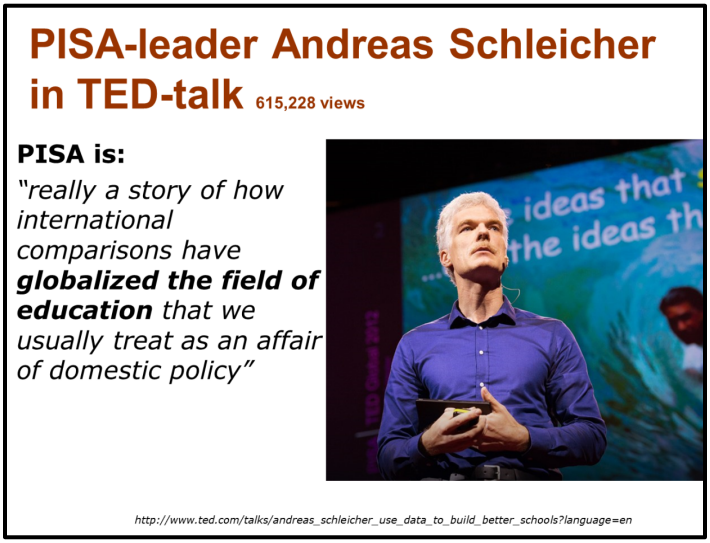

Figure 1: "PISA is really a story of how international comparisons have globalized the field of education that we usually treat as an affair of domestic policy." These are the very first words of PISA-leader Andreas Schleicher's TED-talk, presenting what PISA is really about.

Although the political and educational importance of PISA varies from one country to another, the results often set the scene for public debates on the quality of education. PISA league tables are widely published in mass media, and also used by politicians and educational authorities. In many countries, educational reforms are launched as direct responses to the PISA results.

The testing takes place every three years, and when results from PISA 2015 testing were published in December 2016[3], we now have data from six rounds of PISA. The seventh PISA testing took place in April 2018, and new rounds of PISA are already under preparation, with new aspects to be included, in addition to the core domains: reading, mathematics and science.

[3] OECD, 2016b, 2016c.

The intentions of PISA are, of course, related to the overall aims of the OECD and its commitment to a competitive global free market economy. PISA was constructed and intended for the 30+ industrialized and wealthy OECD countries, but has later been joined by a similar number of countries and "economies". When PISA is presented, its importance is stated by claiming that participation "make up nine tenths of the world economy"[4]. This is a most telling way of counting pupils, but it indicates the focus of the PISA-project: the economy. It seems "common sense" that high scores on reading, mathematics and science are predictors for the country's future economic competitiveness. Hence, bad rankings on PISA are assumed to be bad signals for the future of the country. This, and the status and authority the OECD, is part of the explanation for the public and political obsession with PISA.

Tables of country rankings on PISA scores are often taken at face value, not only in the media, but also by policy makers and politicians. The PISA undertaking is a well-funded international "techno-scientific" machinery, undoubtedly the world's largest empirical study of schools and education. Estimates suggest that the annual cost is around 80 million USD[5]. This amount does not include the costs of involving half a million students, tens of thousands of schools and their teachers. Given the underlying agenda, its size and importance, PISA has to be understood not just as a study of student learning. PISA has to be understood as a social phenomenon in a wider political, social and cultural context, and as a normative instrument of educational governance.

PISA rankings create panic and discomfort in practically all countries, also in high-scoring countries.[6] This produces an urge

[4] OECD, 2010a, p. 3.
[5] PISA-leader Schleicher in interview, Sydney Morning Herald, Nov 29th 2013.
[6] Alexander, 2012.

for politicians and bureaucrats to do "something" to rectify the situation. But PISA cannot, by its "snapshot" research design, say anything about cause and effect. Hence the creativity in interpretations blossoms and educational reforms that are not at all empirically founded are introduced, often overnight.

This essay presents a short history of the increasing importance of education in the policies of the OECD, leading to the launch of its PISA-project. It also presents critical points of two categories. The first relates to the PISA project as such. Some problems are inherent in the PISA undertaking, and hence cannot be “fixed”. It will be argued that it is impossible to construct a common test that in a fair and objective way can be used across countries and cultures to assess the quality of learning and teaching. Problems also arise when the categories and intentions of the PISA framework are translated to concrete test items to be used in a great variety of languages, cultures and countries. The requirement of “fair testing” implies by necessity that local, current and topical issues must be excluded. This runs against most current thinking in e.g. science education, where “science in context” and “localized curricula” are ideals promoted by e.g. UNESCO, educators as well as in national curricula.

The second category of critical points relates to some rather surprising and problematic results that emerge from analysis of PISA data: It seems that pupils in high-scoring countries also develop the most negative attitudes to the subject. The data shows that PISA scores are unrelated to public spending on education, time spent on the subject, class size etc. PISA scores are negatively related to the use of active teaching methods, inquiry based instruction and the use of ICT. Whether one "believes in PISA" or not, such results need to be discussed.

There is a widespread critique of many aspects of PISA in academic articles, and from many different disciplines. The alliance between PISA and Pearson Inc, the largest global providers of educational services and products, is a matter of

grave concern for Education International[7]. EI is, according to their web site "a Global Union Federation that represents organizations of teachers and other education employees"[8]. Education International is concerned about how PISA is used to further commercialization and privatization of national school systems.

In the last part of the essay I look at how the OECD uses PISA as an instrument of power in well-planned media-oriented reports and release of results. The normative power is exerted through seemingly neutral and objective numbers, statistics, rankings and indicators. In reports and recommendations they celebrate "successful" examples for teaching and learning, for schools and school systems, suggesting that they should be copied. The very simple definition of educational "success" is high (or increasing) score on the PISA test, which is assumed to be an objective overall measure of educational quality.

PISA's problematic characteristics

The PISA project is a large undertaking. It has many of the characteristics of what is called “big science” and “techno-science”: It is costly and involves the cooperation of research groups, external consultants, commercial providers as well as policy-makers in around 70 countries. The logistics of the project is complicated, and there are piles of documents with detailed instructions to the national groups who are responsible in the participating countries. Hundreds of experts from several fields of expertise are involved, contracts with subcontractors are given by bids, thousands of schools and teachers, nearly half a million of students spend 2½ hours answering the test and the questionnaire, data are carefully coded by thousands of specially trained markers. Finally, data are submitted to the organizers,

[7] Education International, 2016.
[8] https://www.ei-ie.org/, accessed Dec 15th 2018.

cleaned and verified, and then, by a complicated process converted to the scores that are published.

In this section we go in some detail about what PISA claims to measure and the long road from intentions to the actual test. We also raise concerns about some problematic and surprising PISA results that often are neglected when the public focus is on "the results": league tables of PISA-scores and country rankings.

Claims, framework and test items

What does PISA claim to measure?

The official statements about what PISA measures are in many ways confusing, even contradictory. In some places the PISA reports explicitly declare that they do not measure school knowledge or competencies acquired at schools, in other places they state that they actually do measure the quality the nations' school system.

Let us consider some details. The overall aims of PISA were stated already in 1999, before the first PISA testing took place in 2000. These are the first words in the presentation of the ideas behind PISA:

> How well are young adults prepared to meet the challenges of the future? Are they able to analyse, reason and communicate their ideas effectively? Do they have the capacity to continue learning throughout life? Parents, students, the public and those who run education systems need to know.[9]

These exact words have been repeated in practically all PISA reports from the OECD over the years since then. In other parts of their reports, they are more modest. They stress that PISA scores do not actually provide measures the quality of education

[9] OECD, 1999, p.11.

systems, but the collective results of school, home and social environment.

PISA is explicit that they do not measure according to national school curricula, but based on the framework made by the OECD-appointed PISA experts.[10] The PISA Technical Reports clearly state that the knowledge and skills tested on PISA "are defined not primarily in terms of a common denominator of national school curricula but in terms of what skills are deemed to be essential for future life.".[11] The same report also states that items that are close to the curriculum and items with "school science" are excluded.

So, although PISA states that it does not test school knowledge, and that it does not test according to national curricula or testing school knowledge, the PISA results are presented, also in OECD reports, as valid measures of the quality of national schools systems, and the PISA reports are packed with policy recommendations regarding schools and educational governance.

Constructing PISA: Crucial choices

The process from the PISA ambitions to the actual tests that the students get has several stages, each of them with serious obstacles where many decisions have to be taken. The first step from the overall intentions behind PISA to the actual test is of course the selection of the knowledge domains (or school subjects) that should be included. OECD chose three domains ("literacies") for the PISA testing: reading (in mother tongue), mathematics and science. These are important and basic subjects, of course, but one should keep in mind that most domains are not included.

[10] OECD, 2016a.
[11] OECD, 2009, p.11.

Of course, a test like PISA cannot embrace all possible school subjects, but by selecting some and ignoring others, they pass a message to the public as well as politicians about what is important for schools and for future life. The actual choice of reading, science and mathematics, of course, reflects the basic purpose of OECD; the concern for economic competitiveness in a global, high-tech market economy. When PISA in 2012 extended its repertoire, the new domain was "financial literacy" a school subject that does not exist in the majority of countries.[12] Not all countries included this option in their PISA testing.

The PISA framework

The next step in the process towards the actual PISA test is to make a testing framework for the chosen domains, in reality a "PISA curriculum". Here the experts come in. Key external institutions (who win the bid) and their selected subject matter specialists are in charge of a lengthy process to develop this framework. The academics selected for this purpose are well known international experts in their fields. But, of course, they work within the politically decided frames decided by PISA as a project, and they must all be fluent in English, the working language in all deliberations and working documents. In addition to the subject matter specialists, psychometricians who are experts on statistical measurements play a key role in the whole process.

Most educators will probably find the PISA frameworks developed by these expert groups to be most interesting, with ideas, perspectives and subject matter details that are of very high quality.[13]

These documents could be used as sources for inspiration to make national curricula and to stimulate the debate over

[12] OECD, 2013.
[13] See, e.g. OECD, 2016a.

educational priorities. The problem is, however, that this framework now serves as a normative global curriculum and a framework for an international testing regime that claims to measure the quality of the entire education system in all countries.

As for the chosen contents, it is noteworthy that neither the UN Millennium Goals nor the current UN Sustainable Development Goals and the related initiatives for ESD (Education for Sustainable Development) are mentioned, even in the PISA 2015 assessment framework.[14] This is a manifestation of how the OECD has different educational priorities than those agreed upon by the UN and its sub-organizations UNESCO, UNICEF, UNEP and UNDP.

Uncertainties, errors and bias in PISA scores

PISA scores are estimates of population "real scores" based on data from a sample of respondents. Results are published with error bars due to this sampling error. Typical sampling errors in countries' mean score are around 5 PISA points. Having this in mind, we immediately see that the actual ranking of countries has little meaning for many countries in middle range. Mean differences between e.g. rank 6 and 12 are often not statistically different.

But there are other sources of error that are not well communicated. Wuttke studied the uncertainty and bias in German PISA results in detail, and he notes that Statistical significance criteria of OECD/PISA are misleading because several sources of systematic bias and uncertainty are quantitatively more important than the standard errors communicated in the official reports.[15]

[14] OECD, 2016a.
[15] Wuttke, 2007.

The real uncertainty of PISA scores are likely to be substantially larger than what is published, especially when we look at the measurement of trends, i.e. changes from one PISA-round to the next. Some items are kept unchanged from one round of PISA to the next, and these rather few "link items" are used for the calculations of trends. These errors are documented in the technical reports, but do not appear in the PISA presentation of results in the main reports.[16]

It is also important to keep in mind that the target population of the PISA testing is the 15-year olds who attend school. In many cases this is not the whole age cohort. When PISA-leader Andreas Schleicher[17] on BBC presents Vietnam as a "stunning school success" based on PISA-scores, he ignores the fact that only 56% of their 15 year age cohort attend schools and are eligible for the PISA sample.[18] Similar errors and superficial readings are also made when Chinese schools are judged by the results of e.g. Shanghai, as is also often done. It has been documented that the Shanghai sample does not at all represent the population of 15-year old in Shanghai. About a third of Shanghai's 15-years olds are excluded from the test, a fact that was for a long time denied by the PISA organizers. And of course, Shanghai does not in way represent China as a whole, no more than Boston represents the USA.

Scholars who have looked into the details of this issue, comment:

> In PISA 2015, when Shanghai was combined with other Chinese sub-national education systems, science performance was not significantly different from that in the United Kingdom, Slovenia, or Australia, among others.[19]

A neglected source for uncertainty and bias is the exclusion rate, the per cent of students that are exempt from the population. For

[16] E.g. OECD, 2016b, 2016c.
[17] Schleicher, 2015.
[18] Sellar, Thompson & Rutkowski, 2017.
[19] Sellar, Thomson & Rutkowski, 2017, p.32.

most OECD-countries, nearly all 15-year olds attend school, and hence are part of the target population to be sampled for testing. But also in these countries, some students are excluded from the test for reasons that make them unfit for the test. If these students had been tested, it is most likely that they would be low-scorers and hence lower the population means.

There are strict rules for the exclusion procedures. Still, we see that the exclusion rate varies substantially between countries and over time for the same country. Changes in exclusion rate over time distort the resulting PISA score and how they be compared between countries. They also mislead measures of national trends. In Norway, the exclusion rate was 2,7 % in the first PISA round, but was more than doubled (6,7 %) in 2015.[20] Allegedly mediocre results in PISA 2000 created a "PISA shock" in Norway and paved the way for profound educational reforms. Fifteen years later, the government celebrated PISA 2015 as a success for this reform. In fact, if corrected for the increased exclusion rate, the Norwegian results were more or less identical in 2000 and 2015.

When measuring trends, it is of course also essential that we measure the same each time. But the definitions of the three PISA "literacies" have actually changed over time. The definition of science literacy in 2015 is for instance rather different from the definition used in 2006, when science was the main subject.[21] If you want measure change, you simply cannot change the measure!

A universal test for "real life" challenges?

A fundamental premise for the PISA project is that it is possible to measure the quality of a country's education by indicators that are universal, independent of school systems, social structure,

[20] Kjærnsli and Jensen, 2016, p.18.
[21] OECD, 2006, 2016a.

traditions, culture, natural conditions, ways of living, modes of production etc.

As noted, PISA claims that they measure “how well the young generation is prepared to meet the challenges of tomorrow’s world”. Such an ambition assumes that the challenges of tomorrow’s world are already known and that they are more or less identical for young people across countries and cultures. Although life in many countries have similar traits, one can hardly assume that the 15-year olds in for instance USA, Japan, Norway, Turkey, Mexico, and Germany face the same challenges and that they need identical and measurable skills and competencies in their future life.

One should also keep in mind that the PISA framework and its tests are meant for the relatively rich and modernized OECD-countries. When this instrument is used as a "benchmark" for educational standard in the 35 non-OECD countries that take part in PISA, the mismatch of the PISA test with the needs of the nation and its youth becomes even more obvious.

The ambitions of PISA are great, but are contradicted by the very format of the testing: The PISA test is a pen-and-paper test (from PISA 2015 computer-based in 58 of the 72 participating countries), where students sit for 2 hours to answer written questions, in solitude and without access to sources of information. How much does this test situation resemble “real life” and relate to the challenges that young people may face in their future life as citizens, as participants in tomorrow’s democracy and as skilled workforce? Put in this form, the questions are rhetorical: the PISA test situation does not resemble any real life situations. The only place where you sit in solitude with a written test is in fact in exams at schools and universities. The only places where you are not allowed to communicate with others or allowed to use modern information technologies are similar test situations.

Real life, in private, at leisure as well at the workplace, is more or less the opposite of the PISA test situation. While one should

expect that an organization like OECD should stress the competencies needed by the big international actors on a competitive global market, the PISA test situation is different. Therefore, PISA does hardly live up to serve the political/economical goals of OECD.

PISA item selection and test construction

Once the framework is constructed, the next step is to "operationalize" it, i.e. to use the framework for the development and selection of test items, and for the construction of the PISA test as a whole. This complicated process is described in the voluminous technical reports.[22] These reports are often published more than a year after the release of the PISA results, an important issue that has received serious critique from scholars.[23]

Elements in the item selection process are the following. Each PISA country (OECD countries only) is invited to submit test items that fit the framework and are based on "authentic texts" for "real life situations". Through a complicated process with initial screening and selection, national and international piloting, pre-field trials, main field trial round and psychometric analysis that involve many actors and subcommittees and many meeting for negotiations and debate, the final series of test items is decided.

A logical consequence of wanting to make a fair international test is that an item cannot be used if it behaves in an "unfair" fashion. While this is a sensible argument from a statistical point of view, it also implies that items that are too close to real life contexts of some countries, but not in others, have to be removed. Other principles for exclusion are described as follows.

[22] See e.g. OECD, 2009.
[23] Rutkowski & Rutkowski, 2016.

> The main reasons for assessing units as unsuitable were lack of context, inappropriate context, cultural bias, curriculum dependence, just school science and including content that was deemed to be too advanced.[24]

This clearly states that test units (items) that relate to issues that are considered "inappropriate" (controversial in a particular country), has a "cultural bias" (be it positive or negative), or is close to the school curriculum (in some countries but not in others) were excluded. The statement also explicitly states that items that are "just school science" should be excluded. This is, again, a clear statement that PISA does not measure school knowledge or issues related to school curricula. From the above it seems somewhat strange that such a test is used to judge the quality of science taught at school in each country.

In reality, the test items in the final test are decontextualized, or the context is contrived or historical. Not by the intentions in the testing framework, but based on statistical necessity and concern for "fairness". This runs contrary to recommendations by educators as well as by many national curricula of promoting a curriculum that is relevant, interesting and context-based, at least for the compulsory school level.

Item text, language and translation

A further set of complications arise related to item texts, language and translation. PISA test units are often based on rather lengthy texts that constitute the stem, called "stimulus". The intention is positive, namely to present real, authentic texts in real-life situations. But this format, in particular the length and complication of the stimulus text, also make the PISA items rather different from most tests that are commonly used in school mathematics and science. The verbal test structure distinguishes PISA from for instance TIMSS (Trends in Mathematics and Science Study), the other large-scale study of science and

[24] OECD, 2009, p.34.

mathematics achievement. The weight on text is, of course, a deliberate choice by PISA specialists, and it also underlines that PISA does not really test subject matter and school knowledge.

It is often claimed that many PISA items are testing reading skills rather than science and mathematics competencies. The fact that PISA score for most countries are similar on the three domains, support this claim. Correlations between individuals' PISA score on reading, mathematics and are in the range of 0.77–0.89 and rather similar in all countries,[25] which essentially tell us that they measure more or less the same "thing" or construct. PISA items in later PISA versions have become shorter and may indicate that this critique has been taken seriously.

A robust finding in PISA and other reading tests, like PIRLS (Progress in International Reading Literacy Study), is that girls outperform boys in reading in all countries. However, PISA test scores in science and mathematics show a gender pattern that is different from for instance TIMSS results. The gender pattern of PISA also differs from other tests, like national exams, where boys often outperform girls in science and mathematics. This unusual gender pattern may, at least partly, be explained by the heavy reading load in many PISA items.

The “authentic texts” which constitute the stimulus in each item have originated in a certain situation in one of the OECD countries, and, of course, in the language of that country. This text is, if accepted, then translated into the two official PISA languages before submission to the PISA organizers. The item is then translated into the language of each of the participating PISA countries. This translation process follows strict rules that are laid down in detailed instructions.[26]

This translation raises many questions. Thorough work on the PISA reading test items has been done by Arffman, in her PhD as

[25] OECD, 2005.
[26] See e.g. OECD, 2009.

well as in journal papers.[27] She provides a detailed text-analytical study of the translation from English to Finnish of three PISA items. Her studies reveal many critical dimensions in this process. One of her conclusions is that one can never arrive at what may be called "equivalence of translation". She also notes the scarcity of research on this most important issue. Neither poetry nor good prose can be translated according to a formalized set of rules, a fact that all good translators will acknowledge.

Another study of the translation and adaptation (called "transadaptation") of PISA science items in English, French and Arabic illustrate the challenges associated with the transadaptation and concludes that:

> Cross-cultural comparisons rely on the assumption that transadapted versions of the same test place similar language demands on examinees. However, even when the quality of transadaptation is not a concern, bias at some level is inevitable.[28]

Based on their analysis, they conclude that the transadaptation "may impose different cognitive demands on examinees in different countries, thereby raising concerns regarding the fairness of international comparisons and some of the conceptual underpinnings of the enterprise.".[29]

Professor Harvey Goldstein, a highly respected senior in educational measurement, raises serious concerns about how the OECD underplays the sources of systematic errors that are due to issues of translation. He provides concrete examples of the how his plays out in detail. After reviewing translation issues and other sources of errors and uncertainty his concluding remarks about PISA are unforgiving:

[27] Arffman, 2007, 2010.
[28] El Masri, Baird & Graesser, 2016.
[29] El Masri, Baird & Graesser, 2016.

> Unless OECD changes its focus so that its studies abide by accepted rules for scientific enquiry, it is difficult to see a good case for the continuation of such studies.[30]

Problematic results and growing critique – is PISA off target?

Money spent on education: no influence?

Already from the first PISA round, the OECD produced graphs that showed small or negligible correlations between a country's PISA scores and its spending on education.[31] This, of course, has been discovered and used by politicians world-wide, and the OECD advice that more spending on education will not improve the quality.

More concretely, it is in particular interesting to note that in the five Nordic countries, the relationship between public spending and PISA scores is actually strongly negative. Finland, for instance, is highest in PISA score, but lowest in spending. These relationships are used in political debates in various ways: Finnish teachers have difficulties in asking for higher salaries, more funding or other changes, since they already are on top of the rank. Norway, on the other hand, has been much lower on the PISA ranking, but with higher public spending on schools. Based on PISA, Norwegian politicians have argued that it has been "proved" that more spending would not increase the quality of schools.

PISA findings on cost and funding, like the above, are frequently used in influential OECD publications, like the annual Education at a Glance. They conclude that "averaged across OECD

[30] Goldstein, 2017.
[31] OECD, 2001.

countries, there is potential for reducing inputs by 30.7 % while maintaining outputs constant.".[32]

PISA science scores correlate negatively with interests and attitudes

PISA scores are often presented as league rankings between countries, with the winners on top and the losers at the bottom. But PISA also has many questions about attitudinal aspects of how young people relate to science. This was an important element of the PISA 2006 study, when science for the first time was the core subject. The definition of science literacy in PISA 2006 actually included "willingness to engage in science-related issues, and with the ideas of science, as a reflective citizen".[33] A special issue of International Journal of Science Education [34] presents several interesting results from analysis based on these data.

The possibly most surprising finding is that many countries with the highest mean PISA science score were at the bottom of the list of students' interest in science.[35] Finland and Japan are prime examples: at the top on PISA science score, and at the very bottom on constructs like "interest in science", "future-oriented motivation to learn science" as well as on "future science job", i.e. inclination to see themselves as scientists in future studies and careers. In fact, the PISA science score correlates negatively with Future science orientation (r = -0.83) and with Future science job (r = -0.53).[36]

It should be noted that the above negative relationships are when countries are the units of analysis. When individual students

[32] OECD, 2007, p.16.
[33] OECD, 2006.
[34] International Journal of Science Education, 2011, vol, 33, No1.
[35] Bybee & McCrae, 2011.
[36] Kjærnsli & Lie, 2011.

within each country are the units, some of the correlations are positive.

Such findings are most disturbing for educators who want to base their work on evidence and reasearch. If the students in PISA top ranking countries leave compulsory school with strong negative orientations towards science, one needs to step back and think about the reasons for this as well as the possible consequences. Care should be taken not to interpret correlation as cause and effect, but one should at least think twice before using these countries as educational models and ideals to be copied.

In an analysis of the PISA 2015-data Zhao points out that students in the so-called PISA-winners in East-Asia (e.g. Japan, Korea, Hong Kong, Singapore) seem to suffer from what he calls "side-effects" of the struggle to get good marks and tests-scores.[37] He presents the PISA-data that show that students in these countries get high scores but have very low self-confidence and self-efficacy related to science and mathematics. He points out that

> There is a significant negative correlation between students' self-efficacy in science and their scores in the subject across education systems in the 2015 PISA results. Additionally, PISA scores have been found to have a significant negative correlation with entrepreneurial confidence and intentions."[38]

One should also note that many of the winners in the PISA science score also have the largest gender differences in PISA score. Finland is a prime example. Finnish girls strongly outperform boys on all three PISA subjects. In reading literacy, the difference in means is about 50 % of a standard deviation. Again, such findings from PISA should call for some caution against trying to copy the "PISA winners".

[37] Zhao, 2017.
[38] Zhao, 2017.

PISA scores correlate negatively with inquiry-based teaching

The concept of science as inquiry has a long history and has in recent years been lifted as if it was a newcomer. IBSE (inquiry-based science education) is now an often used acronym, and is the key recommendation in the influential EU-document "Science Education Now".[39] The term IBSE has been adopted as the key concept in calls for EU-funding in the Horizon 2020-program.

In PISA 2015, where science was again the core subject, nine statements in the student questionnaire constitute an Index of inquiry-based teaching. Some of the statements are these: "Students spend time in the laboratory doing practical experiments"; "Students are required to argue about science questions"; "Students are asked to draw conclusions from an experiments they have conducted"; "Students are allowed to design their own experiments" and "Students are asked to do an investigation to test ideas".[40]

Among the interesting findings is that in most of the "PISA-winners" (Japan, Korea, Taiwan, Shanghai, Finland) students report very little use of inquiry-based teaching. For the variation within the same country, the PISA finding is that "in no education system do students who reported that they are frequently exposed to enquiry based instruction [….] score higher in science.".[41]

But, although the relationship between IBSE and PISA test score is negative, IBSE relates positively to interest in science, epistemic beliefs and motivation for science-oriented future careers:

> However, across OECD countries, more frequent enquiry-based teaching is positively related to students holding stronger epistemic

[39] EU, 2007.
[40] OECD, 2016c, p.69.
[41] OECD, 2016c, p.36.

> beliefs and being more likely to expect to work in a science-related occupation when they are 30.[42]

One of the questions in the Inquiry Index may be of special interest. Experiments play a crucial role in science, and have always played an important role in science teaching at all levels. But when it comes to PISA, the report states that: "activities related to experiments and laboratory work show the strongest negative relationship with science performance".[43]

Key concepts and acronyms in current thinking in science education are well known: science in context, inquiry-based science education (IBSE), hands on-science, active learning, NOS (nature of science), SSI (socio-scientific issues), argumentation, STS (Science, Technology and Society). There seems to be no evidence from PISA to back up such advice, PISA rather provides counter-evidence.

The conflict between the recommendations and priorities of scientists as well as science educators on the one hand, and PISA results on the other hand is most problematic. The somewhat provoking question then becomes: Should we sacrifice Inquiry-Based Science Education to climb on the PISA rankings?[44]

PISA scores correlate negatively with the use of ICT

In a special OECD/PISA report on the use of computers in teaching and learning,[45] the highlighted conclusions are strikingly clear:

> **What the data tell us.** Resources invested in ICT for education are not linked to improved student achievement in reading, mathematics or science. […] Limited use of computers at school may be better than no use at all, but levels of computer use above

[42] Ibid.
[43] OECD, 2016c, p.71.
[44] Sjøberg, 2018.
[45] OECD, 2015a.

> the current OECD average are associated with significantly poorer results.[46]

In spite of these clear findings, many countries strongly promote more ICT in schools in order to climb on the PISA rankings. This is just one example of the selective readings of PISA results to justify reforms and initiatives.

Critique from academics

In parallel with the increasing global influence of PISA on educational debate and policy, there has been a growing critique in the academic world. Several readable anthologies have been published.[47] The authors come from many countries and many academic fields and include well-known philosophers, sociologists, economists and educators.

In May 2014, a group of these and other academics sent an open letter to Andreas Schleicher, head of PISA and Director for Education and Skills in OECD. In the letter they voice a series of concerns about the growing influence of PISA.[48] They argue that PISA is killing the joy of learning and lead to the detriment of basic values that schools should strive for. This initiative received public attention, also through coverage in The Guardian and other news media worldwide. The open letter has later been signed by more than 2000 academics from about 40 countries. Behind the initiative we find leading educators like Stephen Ball, David Berliner and Robin Alexander. Noam Chomsky is also behind this initiative, likewise Diane Ravitch, who was previously U.S. Assistant Secretary of Education, appointed to public office by Presidents George H. W. Bush and Bill Clinton. She is now, as distinguished professor of history and philosophy of education, the most influential critic of the market-driven education policies she earlier had a strong belief in. She is the

[46] Ibid., p.146.
[47] Hopmann et al., 2007; Pereyra et al., 2011; Meyer & Benavot, 2013.
[48] Meyer et al., 2014.

author of several influential books; the best known is The Death and Life of the Great American School System with the telling subtitle How Testing and Choice Are Undermining Education.[49]

In an article in the prestigious *Journal Educational Researcher* Rutkowski and Rutkowski give several examples of how the PISA project has weaknesses and shortcomings that are not communicated, and that their conclusions and recommendations are doubtful.[50] They make a "call for a more measured approach to reporting and interpreting PISA results".

It seems fair to say that the criticism of PISA and the way it is used and abused is widespread among academics concerned about schooling and education. This critique has increased over time, also because PISA is extending its scope and influence in several ways. I will return to this point towards the end of the essay.

Politics and global educational governance

As noted in the Introduction, the OECD leader, Andreas Schleicher is proud to announce that PISA has globalized educational policy.[51] More concretely, an OECD Education Working Paper provides details of the normative effects of PISA. The report states, as its main finding, that

> PISA has been adopted as an almost global standard, and is now used in over 65 countries and economies. [….] PISA has become accepted as a reliable instrument for benchmarking student performance worldwide, and PISA results have had an influence on policy reform in the majority of participating countries/economies.[52]

[49] Ravitch, 2011.
[50] Rutkowski & Rutkowski, 2016.
[51] Schleicher, 2013.
[52] Breakspear, 2012.

This report reviews literature as well as results from questionnaires to key policymakers and other officials, and provide a ranking (!) of the impact that PISA has had on all OECD countries. The report informs that even "high-performing countries such as Korea and Japan have enacted reforms in response to a large range of PISA results.".[53]

As noted, we have for at least 50 years had international studies of student achievement, mainly in the same domains that PISA addresses, like TIMSS and its predecessors from around 1960. These studies have had an influence on educational debates and policies in many countries for decades. But the scene changed dramatically when the OECD had launched its PISA-project. By now (spring, 2019), after six released rounds of PISA testing, the other international achievement studies play a much smaller role in most countries, although some of these studies, like TIMSS (Trends in Mathematics and Science Study), actually measure knowledge that explicitly is aligned with curricula, and much closer to what is taught in schools.

So why has the PISA program become so powerful and influential? Why was PISA launched and how is the power and influence exerted? In the following, we briefly consider these most important questions.

OECD and emergence of PISA

The OECD has developed since the end of WW2. It started in 1948 under the name of OEEC (Organization for European Economic Cooperation) as a part of the US-driven Marshall Plan to rebuild the European economy after the war. The member states were 18 countries in Western Europe. The key point was to promote and support a free market, capitalist economic system. An obvious agenda was to provide a defense against communism and the influence from the Soviet Union.

[53] Ibid.

Over the years, the OEEC widened the scope of its activities as well as the membership. In 1961 it changed the name to OECD (Organization for Economic Cooperation and Development). The present (2018) OECD has 35 memberstates, most of them with well-developed economies. Most of the former East European countries joined in 1997. Russia did not join, but has close working relationship with the OECD, and also takes part in PISA.
The PISA home site states that "*the OECD brings around its table 39 countries that account for 80% of world trade and investment, giving it a pivotal role in addressing the challenges facing the world economy*".[54]

From the 1960s, the OECD gradually increased its interest in Human Resources (HR) as a key factor in economic development, with the emphasis on training of a skilled workforce, in particular technical and scientific personnel. A key person in this development was the Norwegian economist Kjell Eide, who for a period also was Secretary of Education in a government for the Norwegian Social Democratic Party (Arbeiderpartiet). Kjell Eide was central in the development of the educational involvement of the OECD in period from the early 1960s, also as chair of The Centre for Educational Research and Innovation (CERI). He has written in detail about the gradual growth of OECD's engagement in education, a history that he summarizes and reflects upon in the book he wrote when he left the OECD.[55]

He describes the political debates and how various positions on the role and importance of education competed in the OECD and its various sub-committees. While some countries argued for the importance of a broad-based curriculum with a weight on human development, others were more oriented towards a more

[54] http://www.oecd.org/about/history/, accessed 12 February 2019.
[55] Eide, 1995.

instrumental role of education: the development of skills for the labour market.

Eide describes how the OECD gradually developed to become an important provider of educational statistics of high quality. He notes how the US representatives in particular pushed the issue of including also measures of the output of schooling in the form of comparable learning outcomes in these statistical measures. By having measures on the quality of output from education, and not just input, one could provide data that could describe the efficiency and productivity of school systems. The issue of "school efficiency" became a contentious issue in the debates in the OECD. Eide writes:

> In the 1980s, in particular the US, aggressively put forward more conservative political ideas on the OECD's educational agenda: quality in education, free school choice, new modes of financing, cooperation with industry and commerce, accountability, efficiency in use of resources, performance pay etc.[56]

Eide also notes that:

> The ambitions may be that the OECD takes the responsibility to arrange international tests and examinations (like TIMSS) on behalf of the governments. […] If so, this will make the OECD to a strong instrument of power, and will contribute to a harmonization that will exceed everything that we have feared from the EU.[57]

This was written just two years before the planning of PISA commenced. One may argue that Eide's fears have fully been realized. In the first report from PISA/OECD, the joint commitment of the OECD "owners" was clearly stated:

> PISA represents a new commitment by the governments of OECD countries to monitor the outcomes of education systems in terms

[56] Eide, 1995, p. 95, author's translation.
[57] Ibid., p. 104.

> of student achievement, within a common framework that is internationally agreed.[58]

This was written a year before the first PISA testing, and indicates the intentions and ambitions of the PISA undertaking. In later reports, the normative nature of PISA is even more explicit. The PISA 2009 report states in the Introduction that "*PISA […] provides a basis for international collaboration in defining and implementing educational policies*".[59]

The political and normative nature of PISA is well described by Ulf Lundgren, a Swedish professor in the field of educational philosophy and educational policy. Following Kjell Eide, Lundgren played an important role in the OECD's work in education. Lundgren has undertaken evaluations of education systems in many countries, and worked for the European Commission, UNESCO, OECD and the World Bank. He was also Director-General of the Swedish National Agency for Education 1991-2000. In the same period he played a key role in the discussions in the OECD leading up to the launch of PISA in 2000. More than a decade later, he reflects on "PISA as a political instrument".[60]

> The outcomes of PISA we hoped could stimulate a debate on learning outcomes not only from an educational perspective but also a broad cultural and social perspective. Rarely has a pious hope been so dashed.[…] When the first results came they got an impact that was not expected, not even dreamed of.[61]

Lundgren ends his article by concluding that:

> PISA is an example of what in a global world nationally is perceived as the answer to what is going to be taught, who it is

[58] OECD, 1999, p.11.
[59] OECD, 2010a, p.3.
[60] Lundgren, 2011.
[61] Lundgren, 2011, p.27.

> going to be taught and how will the outcomes of teaching be judged and used for control and political governing.[62]

The power and status of the OECD

The prime concern of the OECD is to promote economic development in a free market. The priorities and activities of the OECD are decided by committees with representatives for the member states' governments. Hence, the OECD has a status that is very high. They provide policy advice and expert reviews regarding the economy, the labour market and other fields. These reports and advice are taken as objective, scientific and neutral, and are key elements in most countries' policy development.

PISA is owned and organized by the OECD member states' governments and governed by politicians and their appointed bureaucrats. The PISA Governing Board is composed of representatives of OECD members, clearly expressed the following way: "*Representatives are appointed by their education ministries. […] The Board determines the policy priorities for PISA and makes sure that these are respected during the implementation of each PISA survey*".[63]

This political background of the PISA programme, and OECD's mandated stress on the word *economy* distinguishes PISA from studies like TIMMS and PIRLS, which are organized by the IEA (International Association for the Evaluation of Educational Achievement). The IEA grew out of academic communities and their research interests from the early 1960s, although they often enjoyed political and economic support from governmental sources. The IEA-studies do not have the same direct commitment to political or ideological stances. In later years, however, governmental departments are IEA member institutions

[62] Ibid., p.28.
[63] http://www.oecd.org/pisa/contacts/pisagoverningboard.htm, accessed 12 February 2019.

and do play a more active role in the policies of IEA, not only in the funding of their many projects.

In short: the main normative power and of PISA is due to the particular political and economic status of the OECD and its ownership by member states' governments. When PISA was introduced by the OECD, it immediately started to influence also the education sector, which was explicitly the purpose of the programme.

Competition, market thinking and globalization

The PISA project should be seen as part of a wider international policy trend where concepts and ideas from the market economy are used in the education sector. Key words here are competition, success, market, and globalization. These ideas are visible in many sectors of society, also in education, and are part and parcel of the free market capitalist economic system and its underlying beliefs.

A most visible aspect of PISA is its focus on league tables and numerical scores. This creates competition, where there are winners and losers. The countries at the top are celebrated as "successful", and PISA reports hold them up as winners and models. Everything seems to centre on having success: PISA reports celebrate successful systems, successful schools, successful reformers, successful learners.[64] The underlying belief is that competition in a market always generates quality and leads to success. And the purpose and meaning of life is to have success and to be competitive.

As mentioned, the term New Public Management is used to describe a market driven system which is supposed to make the public sector more efficient. Terms like quality, efficiency, transparency, accountability, productivity, and “value for

[64] OECD, 2010a, 2012, 2015b, 2016c.

money" are among the (often positively laden) terms that are used in these policy reforms in many public sectors. Public services like schools and higher education, culture, health and care are all being invaded by market terms. Other (previously) public sectors experience the same trend: police, security, postal services, transport, water supply, handling of household garbage, sewage and waste, water cleaning etc. Traditional public services are increasingly subjected to competitive bids where they compete with private actors. Outsourcing of key public services is an international trend, and bids are often taken over by multinational companies, a process that is eased by new regulations on international trade. This trend towards marketization and privatization characterizes the development in several countries. And the education sector is in forefront, with OECD as actor and with PISA project as an efficient tool.[65]

A related political/economical perspective is that of globalization. The economy is getting globalized, large multinational companies increase their influence, and the workforce has to be flexible and moveable. Hence, there is a need for common standards in education, common systems for exams, degrees and qualifications. Such tendencies operate within over-national units like the European Union, where an example is the "Bologna process" and its introduction of a common degree system in higher education. In key areas, the OECD is playing an increasingly important role by developing and monitoring common standards, indicators and measures.[66]

This PISA-inspired process represents a political pressure to standardize, harmonize and universalize national institutions like a country's school system and to promote competition on the global educational scene.[67] While most educators argue for context-based teaching and localized curricula, at least in the obligatory school age, the pressure from PISA is in the opposite

[65] Meyer & Benavot, 2013.
[66] Grek, 2009.
[67] Ball, 2012.

direction. A driving force behind these reforms is often the use of indicators, quantifiable and measurable standards that can be used for calculations.[68] PISA test scores and rankings are ideal for this purpose, whether the researchers behind the projects like it or not.

Human Capital Theory: Test scores and economic prosperity

The importance of human resources as prime drivers in the modern economy was the main reason for the OECD to focus on education. The theoretical underpinning of this is often referred to as Human Capital Theory. The competencies of the work-force in contemporary economy are considered to be even more important than other forms of capital, like machines, buildings and infrastructure. Hence, the efficient development of a productive work-force becomes a key concern for development of the economy. In this perspective, using money on education is not only for individual growth and development, but an investment that will pay off in the future of the country's economy and competitiveness.

To-day, it therefore seems "common sense" that high scores on science and mathematics tests at school are good predictors of future economic prosperity. Bad rankings on PISA are presented as bad signals for the future of the country. This postulation is probably the main reason for the extreme importance that is given to PISA results and rankings. PISA is in fact also "sold", presented and understood in this perspective.

Important underpinnings regarding the importance of education for economic prosperity are the works of Professor Eric Hanushek. He is often considered the father of the field "school effectiveness". Among his well-known assertions are that class size does not matter for the quality of teaching. He is also central

[68] Popkewitz, 2011.

in the development of the highly controversial Value Added Model for calculating the "value added" effect that a school or a teacher has on student learning. Results from these calculations are used in accountability-systems in for instance the US to rank schools and individual teachers, often also determine salaries and even for firing teachers or principals if they don't "deliver" satisfactory results.

Over decades, Hanushek has published extensively on the relationship between economic investment and educational quality and is widely used by the World Bank and the OECD. With his companion, the German professor Ludger Woessman, he authored the OECD report on "The long run Economic Impact of Improving PISA Outcomes".[69] In this report, they provide numbers on how much each country will earn on improving the national PISA-score. They provide different scenarios for the implications of different magnitudes of PISA improvements.

Concretely, they assert that an increase in 25 PISA points (a quarter of a standard deviation) over time will increase the German GDP with 8088 million USD.[70] If Germany improves its PISA score to the level of Finland, they claim that "*Germany would see a USD 16 trillion improvement, or more than five times current GDP. All of these calculations are in real, or inflation-adjusted, terms.*[71]

In the same publication he asserts that Denmark would earn 586 billion dollars, Norway 841 billion and Sweden 1019 billion.[72]

These and other findings based on Hanushek's economic modelling have been strongly rejected by scholars from many academic fields. Recently, also the calculations are challenged in

[69] OECD, 2010b.
[70] Ibid., p.23.
[71] Ibid., p.25.
[72] Ibid., p.25.

an article that claims that they are based on invalid statistics. For an academic article, the title is sharper than one often sees, even naming the target for the critique: *A new global policy regime founded on invalid statistics? Hanushek, Woessmann, PISA, and economic growth*.[73] The authors have used exactly the same data, and come to completely different results. The abstract in the article is strong:

> Several recent, highly influential comparative studies have made strong statistical claims that improvements on global learning assessments such as PISA will lead to higher GDP growth rates. These claims have provided the primary source of legitimation for policy reforms championed by leading international organisations, most notably the World Bank and OECD. […]
>
> The consequence is continued utilization and citation of these strong claims, resulting in a growing aura of scientific truth and concrete policy reforms. In this piece we report findings from two original studies that invalidate these statistical claims. Our intent is to contribute to a more rigorous global discussion on education policy, as well as call attention to the fact that the new global policy regime is founded on flawed statistics.[74]

This gruesome critique has not been met, but informed scholars working with PISA comment that "*In any event, the truth is that even if one discredits the argument by H&W no one will really care and their work will remain relevant for those in power. It is depressing but true*".[75]

PISA, Pearson, and the market

PISA has established a close cooperation with ***Pearson Inc.***, the former owner of Financial Times, The Economist, Penguin Group and Dorling Kindersley. Pearson has expanded its activities into the education sector and has become the world's largest company for testing and education programs, with 40,000

[73] Komatsu & Rappleye, 2017.
[74] Ibid.
[75] Private communication. The author prefers not to be named.

employees in more than 80 countries. 80 percent of Pearson's revenues now come from education, maybe the world's fastest growing market sector. Pearson won the bid for important parts of the PISA 2015 testing and developed strong links with OECD. Pearson has, of course, a vested interest in creating a market for its services and products. Through its close partnership with OECD it has come in a good position to expand its market as well as its influence. Diane Ravitch, mentioned above, is concerned about this influence, and expresses it this way: "*Are we prepared to hand over our children, our teachers, and our definition of knowledge to Pearson?*".[76]

For the PISA 2018, Pearson took an even stronger grip on PISA. A joint press release from OECD and Pearson proudly announces that:

> Pearson has won a competitive tender by the OECD to develop the Frameworks for PISA 2018. […] The frameworks define what will be measured in PISA 2018, how this will be reported and which approach will be chosen for the development of tests and questionnaires. [77]

This key role in PISA does not, of course, imply that Pearson's staff is doing the work. But they organize and administer the process. Pearson continues to forge personal links with countless academics in key positions and numerous representatives for national educational authorities. This contract is of course a most valuable strategic investment for Pearson. The cooperation is already in place for several bi-products, like a video series about "Strong Performers and Successful Reformers in Education".[78]

Many other commercial providers of educational services operate in the global market. The market is enormous, since all countries use a substantial amount of the national spending for schools and education. Commercial, private and for-profit providers take an

[76] Ravitch, The Washington Post, May 7th 2012.
[77] Joint Press release PISA/OECD and Pearson, Dec 10th 2014.
[78] http://www.oecd.org/pisa/pisaproducts/, accessed 12 Februray 2019.

increasing slice of this cake. *Edu-business* has become a blooming global market, often fueled by the results of the large-scale international studies, in particular PISA. The World Yearbook of Education in 2016 had "The Global Education Industry" as its main topic.[79] Large portions of what used to be public services are out-sourced to commercial providers. It falls outside the scope of this essay to elaborate on this most important issue.

PISA: Redefining the purpose of schooling

The most fundamental and serious influence of PISA is that it redefines the very purpose of schooling and education. PISA claims to measure skills and competencies that are important for the future economy and employability. It thereby ignores that schools serve the much broader purpose of contributing to the personal, human and social development of the child with an overall aim to help them become well-informed and well-functioning individuals and citizens. In all countries, the obligatory school is the key socializing agent. The school provides the induction in the nation's culture, values, history and norms, and the school is a place where the developing child is exposed to a broad variety of disciplines and ways of thinking and acting.

PISA assumes that this complex set of purposes of the school can be reduced to one common, standardized and measurable metric, independent of country, culture and context. It is this basic postulation that is the most serious objection to the whole PISA undertaking. PISA reduces the purpose of schooling to be what can be measured on a single dimension in a single test at a particular time in a sample of 15-years olds in school.

Governance by "soft power": numbers, rankings and comparisons

[79] Verger, Lubienski & Steiner-Khamsi, 2016.

Neither PISA nor its "owner", the OECD, has any formal, legal power. They exert influence by through a range of instruments and actions, collectively often labeled "soft power".[80] A key role is played by the provision of numbers and indicators. Over the years, the OECD has become a key global provider of statistics, not only for the economy, but also in the education sector. The OECD statistics is increasingly being used by other global actors, including the European Union, the World Bank and gradually also UN-organizations like UNESCO.

Good and reliable statistics is, of course, important. But statistics and indicators do not just describe reality, they construct and shape reality. What you choose to measure also defines what is seen as important. How you construct an indicator builds on underlying assumptions and value-based priorities that are soon forgotten when league tables are constructed and presented.

Simon Breakspear is making the same point clear in a report with the telling title "*How does PISA shape education policy making? Why how we measure learning determines what counts in education*".[81]

Educational indicators that are meant to describe and compare different countries and cultures require standardization and clear definitions to ascertain that they measure "the same thing" across borders. Even describing and comparing a seemingly simple occurrence like "student flow" through the education systems is problematic. The International Standard Classification of Education (ISCED) constitutes the commonly agreed indicators have been developed over time by the UNESCO Institute for Statistics. The purpose is to provide "*a comprehensive framework for organising education programmes and qualification by applying uniform and internationally agreed definitions to facilitate comparisons of education systems across*

[80] Bieber & Martens, 2011; Pons, 2017.
[81] Breakspear, 2014.

countries."[82] The handbook for this seemingly simple counting exercise is highly complicated. The work of this kind on a common metric of educational flow has over the years been developed by the UNESCO, but the OECD is gradually taking the role as provider of educational statistics.

The "soft-power" influence of PISA takes many forms, but they all rest on the use of comparisons, statistics and indicators. Xavier Pons has provided a critical review of "research on PISA effects on education governance".[83] Gita Steiner-Khamsi explores "the politics of league tables" and "cross-national policy borrowing and translation".[84] Sotira Grek has coined the term "the PISA effect" in European education policy, which she asserts builds on "governing by numbers.".[85]

Climbing on the PISA rankings have been formulated as the main goal for schools in many countries. One example is Australia; where the prime mister, Julia Gillard in 2012 stated that "*The government will use PISA … to track Australia's progress compared with the rest of the world. By 2025, Australia should be top five in the world…*". Other countries have made similar statements, using PISA ranking to the main educational goal.[86]

PISA results are creating competition, not only between countries, but also between states, territories and districts within one country (Canada, Australia, Germany, USA). Some researchers describe PISA as "a global educational race".[87]

PISA reporting: targeting the media and policy makers

[82] UNESCO, 2012.
[83] Pons, 2017.
[84] Steiner-Khamsi, 2003, 2014.
[85] Grek, 2009.
[86] Breakspear, 2014; Pons, 2017.
[87] Sellar, Thompson & Rutkowski, 2017; Sjøberg, 2016.

The educational governance by PISA has many aspects. The great institutional authority of the OECD is already mentioned. This authority is strongly exercised when results of PISA rounds are published every third year. Well attended and coordinated press conferences are arranged in all participating countries (often at Dec 5th at 1000 AM GMT). The press is provided with well-prepared briefs, and the international and national reports are released. Waiting to hear "the winner is…"

These PISA reports are not regular peer-reviewed documents written for an academic audience, but directly addressing the media and policymakers. These products are glossy and colorful, well written, with simple messages, conclusions and recommendations. Presentation videos and interactive data animations are also made available.

The invitations to the press briefings and the release of reports clearly state that the PISA results should be seen as indicators for the future the of the country's economic competiveness. Just one example: The press invitation for the PISA 2006 release in the National Press Club, Washington, DC, December 4, 2007 had the title: "*Losing Our Edge: Are American Students Unprepared for the Global Economy?*" The text states that "*The lessons learned from PISA results […] can, and should, be used to inform U.S. education policy so that our students graduate … ready to compete, thrive, and lead in the global economy of the twenty-first century*".[88] Similar wordings are regularly used at PISA launches in other countries. In all participating countries, the PISA results are given broad coverage, invariably with the focus on the country rankings.

In the 3-year period between the releases of new PISA results, a series of "policy briefs" are released, thereby maintaining the public influence and pressure through media coverage. The purpose of these policy briefs is stated as "*a series of monthly education policy-oriented notes designed to describe a PISA topic*

[88] Alliance for Excellent Education, 2006.

in a concise, user-friendly way." Many of these "user-friendly" media-oriented products are made in close cooperation with commercial providers, where Pearson Inc. plays the main role. Until February 2019, 92 policy-briefs have been published.[89] They are often most interesting, but are not presented as scientific papers and addressing and addressing an academic community, as also noted in the title: they are "policy briefs". These briefs are not presented at academic conferences or published in peer-reviewed journals or books.

An influential initiative for maintaining the attention to the rankings and the educational competition is "*The Learning Curve, a global project to help influence education policy and practices, at local, regional and national levels*"[90]. The Learning Curve *is "published by Pearson and written by The Economist Intelligence Unit.*" The main product is a ranking of the quality of educational systems, based on several data sources (PISA, TIMSS, PIRLS, PIAAC etc). This list receives a lot of attention by the media, and also by politicians, who often get panic when their country is lower than they expect or when they move down on the rankings.

The PISA leader Andreas Schleicher is listed as member of the advisory board in the 2014 Pearson Learning Curve report. PISA data play a central role in the rankings published under the heading "Which countries have the best schools?" This ranking provides media coverage world-wide and maintains the pressure on policymakers to "do something". This creates and maintains a market for educational solutions, tests and programs. Also for Pearson.

As exemplified above, the so-called PISA-shock is not "created by the media" as often claimed, but is created by the OECD itself at the PISA release and subsequent policy-briefs and reports, often adapted to the national contexts.

[89] OECD, 2018b.
[90] Pearson, 2018.

The modes of marketing of PISA create and maintain an atmosphere of urgency in many countries. This is also a "window of opportunity" for reforms. A perceived crisis provides the need "to do something". But, since PISA cannot by its design explain neither success nor failure, the "crisis" can open for all sorts of reforms being legitimized by PISA results.[91]

Expanding and extending PISA

Seen from the OECD, PISA has been a remarkable success, which they also are proud of. By providing rankings, data and indicators based on its data, the OECD sets the scene for discussions about quality of schooling and entire school systems. And in most countries, politicians and policy-makers follow suit. Given this success; it is easy to understand that the OECD is also broadening its scope and influence on the education sector with other "PISA-like" studies, ranging from kindergarten to adult life, from the national level to school level, and from highly developed OECD countries to developing countries.[92] A brief indication of the expansion follows:

"Starting Strong", often called Baby PISA**,** is one of several OECD-programs to address preschool/kindergarten level (ECEC: Early Childhood Education and Care), also by comparing attainments and competencies and the return of investments in early child care.[93] The home site states that *"New PISA 2015 analyses help highlight the relationship between the number of years of ECEC and academic performance at age 15, and the effects of ECEC attendance on health and well-being, and mothers' employability."*

"PISA-based Test for Schools" is a "PISA-like" test that may be used to test how well a school or school district compares with

[91] Alexander, 2012.
[92] Sellar and Lingard, 2018.
[93] OECD, 2017a.

each other or with the PISA-winners. It may thereby bring the power of influence closer to school districts, local authorities and even particular schools and their teachers. The product is commercially available in the USA, UK and Spain.[94]

"PIAAC, Survey of Adult Skills" (often called "PISA for adults") is measuring skills and competencies of the adult work-force (16-65 years), on a scale similar to the PISA scale for "PISA-like" competences. The survey measures adults' proficiency in key information-processing skills - literacy, numeracy and problem solving in technology-rich environments - and gathers information and data on how adults use their skills at home, at work and in the wider community. In each country, a representative sample of about 5000 are interviewed in face-to-face settings. Some 40 countries took part in the first testing round, and data are published and available in many formats, see for instance.[95]

"PISA for Development" is a version of PISA that is meant to be used by low- and middle income countries. It will do this using "*enhanced PISA survey instruments that are more relevant for the contexts found in middle- and low-income countries but which produce scores that are on the same scales as the main PISA assessment.*" In this project, the OECD also defines supposedly globally valid competencies that are needed for young people in all developing countries. Results are likely to be used as benchmarks for development assistance from the World Bank and other donors. PISA for Development publishes regular policy briefs with progress reports and findings.[96]

"Education at a glance: OECD Indicators" This is an annual book that brings indicators and statistics from the above and other sources, and is widely used by policymakers and researchers world-wide. It is presented as "the authoritative

[94] OECD, 2018c.
[95] OECD, 2016d.
[96] OECD, 2018a.

source for information on the state of education around the world" and is published in English, German and French. It contains data from the best available sources, where the OECD's own data constitutes the core. These data are also available in different formats (like Excel) to be downloaded for analysis. It provides key information on the output of educational institutions; the impact of learning across countries; the financial and human resources invested in education; access, participation and progression in education; and the learning environment and organisation of schools.[97]

As argued above, the OECD has over the last decades emerged as probably the prime source for high quality data, statistics and indicators to describe and understand what is going on in education world-wide. Given the authority of the OECD and the power of numbers and statistics, one may say that this may to also be seen as the power to define the purpose of education and set the political agenda.

Winding up: take care

This essay has focused on the problematic sides of PISA and how PISA has become a global tool for governance of education. The positive virtues of PISA should not be ignored. The PISA project has led to an increased interest in and concern for education and the competencies that young people need to develop to achieve the different “literacies” that are needed for their future life as well as for the wellbeing of their societies. The data bank generated by successive rounds of PISA is remarkable, and is most likely the largest and most professional data source in the history of social science and education. These data are also well documented and are open for most interesting research. The weaknesses and limitations of the data should, however, been kept in mind.

[97] OECD, 2017b.

International comparisons in education are important; they can open for new perspectives, and they can provide inspirations and ideas for educators, researchers and policymakers. However, international comparisons have kind of a Janus face; they can be understood and used in two opposite ways. Such studies may be eye-openers to acknowledge and celebrate the great variety between youth, nations and cultures on aspects of education, and as such serve as a source of inspiration. But such studies can also be used normatively, providing a pressure to oblige and fit to allegedly universal and common standards set from the authority of external specialists. We experience what is seen as a prime example of New Public Management as well as a kind of global governance and standardization of education, as also noted by key educational experts.[98]

The influential Finnish educator Pasi Sahlberg characterizes the current educational PISA-driven educational reforms by the acronym GERM: Global Educational Reform Movement, characterized by privatization, market driven reforms, free school choice, competition and test-driven accountability.[99] He notes that "Finland has remained immune, but other Nordic countries have moved to adopt policies that are close to GERM".[100]

It is important that people (researchers, teacher unions) who are critical and skeptical towards PISA have thorough knowledge about the project and the other PISA-like studies mentioned in this essay. Data never talk directly and "for themselves", but need to be selected and put together to produce and argument or to support a stance. One may in fact also use PISA statistics and indicators to tell "other stories" than those usually presented in the media, often well prepared by the organizers. Given the enormous amount and variation of data from PISA, one may construct widely different about success as well as failures.

[98] Ball, 2012; Rinne, 2008.
[99] Sahlberg, 2011.
[100] Sahlberg, 2011, p. 125.

Widely different stories may be told; stories that are equally "evidence-based" as those too often told.

The stated intentions of PISA, as cited earlier, can easily be endorsed. No one can disagree with the need to ascertain that young people develop the knowledge, skills and competencies needed to face the challenges as citizens of the future. But the underlying ideological, economic and political ambitions behind the OECD-driven PISA project are often ignored or under-communicated. Even researchers in the PISA project seem not to understand (or accept) the overall political/economic aspects of the project. Many national reports do not quote the key statements that describe the normative intentions of PISA. Maybe they feel embarrassed by the claims being made?

The inherent difficulties in measuring what PISA asserts that it measures are seldom fully understood. The road from the brave intentions to the actual test instruments and published data is long and murky. This essay has pointed to some of the problematic issues in this process. This relates to the selection of subjects, (and of ignoring other subjects). Fundamental problems are also inherent in the development of an international, fair test, which by necessity leads to context-free items. Further complications arise when items are to be translated to other languages. In this essay and elsewhere[101] I argue that it is not just problematic to live up to the intentions laid down in the overall statements of PISA. I argue that it is in fact a "mission impossible".

No test is better than the items it consists of. The secrecy over most PISA items makes critique and scrutiny from the academic community and the public difficult. Many of the published PISA items have met serious critique, both for its contents and for its language and relevance. Translations into the many different languages have only to a limited degree been examined, but it is

[101] Sjøberg, 2007.

easy to find flaws and even substantive changes and mistranslations. More research is needed here.

The problematic and not very transparent use of statistics receives considerable critique. Suffice it to note that the statistical procedures leading from individual test scores to the published population parameters, like PISA mean scores, are seriously challenged. Kreiner and Christensen write that their findings "do not support the claims that the country rankings reported by PISA are robust."[102] In the analysis of the PISA 2015 data, the procedures were changed, in part to meet this criticism. This caused the resulting PISA scores of some countries changed dramatically, much more than deemed educationally possible for a three year period. The details of these discussions are only for specialists in psychometry, and not for an essay like this. But it indicates the danger of just accepting PISA scores as given and unproblematic.

There seems to be little attention to the fact that many of the results of PISA are at odds with what educators recommend as well with what politicians propose as prescription to improve the quality of schools. Many politicians want their countries to catch up with the PISA winners, but to do so, they often advocate measures that are the opposite of what these winners actually do. Moreover, the PISA-winners are actually doing very different things, so this opens for choosing examples that fit the policymakers own priorities. There is a need to address seriously these paradoxical results.

PISA has a profound influence on educational policy in most countries, and this is indeed the clearly stated intention behind the project. It is, however, obvious that PISA results are used selectively, misused and even distorted for political purposes in many countries. The reference to PISA to justify and legitimize educational reforms is widespread. This influence ought to be better researched and scrutinized. PISA is in essence a political

[102] Kreiner & Christensen, 2014.

project, a perspective that often falls outside the agenda of the educational research community.

The recent expansion of PISA into schools and school districts, kindergarten, adult education and education in developing countries needs to be followed with great concern, likewise the close connection between PISA/OECD and global, commercial actors in the strongly emerging field of Edu-business, like Pearson and McGraw-Hill Education.

Large resources are used to run the PISA project and to produce their reports and publications, but critical research is scarce and not well funded. A key aspect of the academic ethos is to provide a critical voice, and to question and challenge conventional wisdom. Given the great political and educational importance of PISA, there is a strong need for critical and independent research.

This brings us to a most important concern: critique of PISA may be risky business. The research communities in many countries are currently under the pressure to get funding and support for their activities. External funding has increasingly become important, also for public universities. For promotion in this system, the track record of the ability to get contracts and win bids has become an important aspect of an attractive CV. When positions are advertised, the track record of earning external money is important, also explicitly stated in the criteria for a successful application.

Many academic institutions have staff that depends on temporary contracts with external funding.

The funding for free, peer reviewed critical research, is limited, and often under pressure. More funding is available for contracted and commissioned research, from governmental and ministerial sources as well as from private interests. Academic freedom and the basic ethos of science and research are under increasing pressure. Many universities and their departments are run like companies, and the bottom line on the budget trumps the academic ideals. Large contracts depend on winning tenders

and bids. Balance sheets and bottom-line thinking has become part of academic governance, often with a professional, often non-academic leadership with external board members, representing the "users".

In such an atmosphere, the leaders and staff often exercise a form of self-censorship, not wanting to upset or criticize the interests that sit on the funding. If you are a young researcher, hoping to make a career and finding funding, it may not be a very good idea to be too critical towards the funding agencies for research, in particular those who are under strong political control.

The International large scale assessments, in particular PISA, but also TIMSS, TALIS, PIRLS and several others, provide solid funding for many academic institutions world-wide. For research institutions which rely heavily on external funding, it becomes important to keep a positive relationship with the funding agencies, in this case the government and their ministries of education and research. If you are young and want a career and a job, critique of PISA may not be your first choice of theme.

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