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Using international assessments to inform education policy in Ireland

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Ireland has participated in several large-scale international assessments in recent years, including TIMSS and PIRLS at primary level and TIMSS, PISA, ICCS and TALIS at post-primary. These assessments (together with complementary national research programmes) have, to varying degrees, been used to identify particular strengths and weaknesses in the Irish education system and to inform the development of educational policy. This paper presents an overview of Ireland's experience with international assessments. Recent findings show significant improvements in performance on certain indicators, particularly at primary level and among lower-achieving students. However, these studies also show that the performance of higher-achieving students in Ireland is lower than might be expected, and that some weaknesses persist; for example, in students' ability to demonstrate higher-order mathematical reasoning or problem-solving skills, and in primary students' science achievement. The response of policy-makers to these findings is discussed in light of the utility of participation in international assessments, cautions in interpreting their results appropriately, and the broader issue of what international assessments should and should not be used for.

Introduction

Ireland has taken part in several international large-scale assessments (sometimes known as ILSAs) of education in recent years.[1] At primary level, Irish Fourth grade students took part in the TIMSS (*Trends in International Mathematics and Science)* assessment of **mathematics** and **science** achievement in 1995, 2011, and most recently in 2015. Work has already begun on the 2019 TIMSS assessment. Fourth grade pupils' **reading** skills have also been assessed by the PIRLS (*Progress in International Reading Literacy Study*) assessment in 2011 and in 2016. Both of these studies are organised by the International Association for the Evaluation of Educational Achievement (IEA), which is a transnational consortium of independent research institutes and government research bodies.

At post-primary level, TIMSS has also been used to assess Eighth grade students' **mathematics** and **science** achievement in 1995 and in 2015, while the **civic knowledge** of

[1] The term 'ILSA' is sometimes used to refer only to assessments reporting student performance on an achievement test, but can also include any large, well-documented cross-national study focusing on "substantive notions, implications, and aspects [of education]" at a system level (see http://ilsa-gateway.org/about). The term is used in the latter sense here, encompassing studies such as TALIS as well as TIMSS, etc.

Eighth grade students was examined in the IEA's ICCS study (*International Civic and Citizenship Study*) in 2009. The performance of 15-year-old students[2] on tests of **reading**, **science** and **mathematics** has been tested every three years since 2000 as part of the PISA (*Programme for International Student Assessment*) study. Finally, and somewhat differently to the other studies just described, the **training, attitudes and teaching practices** of lower secondary teachers (teachers of students in Grades 7-9) were examined in TALIS (*Teaching and Learning International Survey*) in 2008.[3] Unlike TIMSS, PIRLS, and ICCS, which are sponsored by the IEA, the latter two studies – PISA and TALIS – are organised by the Organisation for Economic Cooperation and Development (OECD).

It should be noted that there are also other ILSAs in which Ireland has not participated. For example, the IEA has been working in recent years on setting up a study of early childhood education (a report on the early childhood education policies in eight countries was released in 2016, although no data have been gathered directly as yet). A survey of third-level teacher education institutions, known as TEDS-M (*Teacher Education and Development Study in Mathematics*) was conducted in 2008 in order to gather information on the characteristics of teacher education programmes and the beliefs of trainee teachers. Eighth grade students' digital literacy, or their ability to use computers and other digital devices effectively, is investigated through ICILS (*International Computer and Information Literacy Study*), which took place in 2013 and will be administered again in 2018. Finally, although TIMSS is normally administered to students in Fourth grade and Eighth grade, there is also an option to take part in a sister study called TIMSS Advanced, which assesses the knowledge of students who are enrolled in advanced mathematics or physics courses in the final year of post-primary education (Grade 12) or the first year of third-level education. Because Ireland has not taken part in these studies, I will not devote much more attention to them in the following discussion, which focuses on the development of Irish policy in response to ILSAs. However, educators and policy-makers should be aware that many studies exist, each with different aims and target populations. The choice to participate in any particular study (or a combination of studies) should be informed by the needs and the priorities of one's own national education system.

What can ILSAs tell us?

[2] Note the change in target group from a grade level (Eighth grade) to an age group (15-year-olds).
[3] Ireland also took part in a precursor study, ISUSS (*International Survey of Upper Secondary Schools*), in 2001.

Ireland's participation in recent ILSAs has drawn attention to some of the ways in which the Irish education system appears to be promoting good educational outcomes, as well as some of the areas where there is room for improvement. Some consistent patterns in performance in particular academic domains can be observed by looking across TIMSS, PIRLS, and PISA results over several cycles. In general, Irish students tend to perform at a very high level on **reading** assessments, relative to students in most other countries. For example, at primary level, only five countries achieved a significantly higher score than Ireland in PIRLS 2011 (Eivers & Clerkin, 2012). At post-primary level, Ireland has tended to be among the highest-performing countries for reading literacy in several cycles of PISA, including the most recent administration in 2015 (Shiel, Kelleher, McKeown & Denner, 2016). Performance in **mathematics** assessments is somewhat lower in comparative terms (in the number of countries performing at a higher or lower level), but still reasonably good. In TIMSS 2015, only five East Asian countries, together with the Russian Federation, achieved significantly higher scores than Irish students in mathematics at Grade 8, while the same countries (plus one more, Northern Ireland), achieved significantly higher scores at Grade 4 (Clerkin, Perkins & Cunningham, 2016); by comparison, the mathematics scores of Irish students were significantly higher than those in 27 countries at Grade 8, and 37 countries at Grade 4. In the latest round of PISA, in 2015, Irish 15-year-olds also achieved mathematics scores that were significantly above both the OECD and EU averages. Finally, Irish students tend to perform reasonably well in both the TIMSS and PISA **science** assessments at post-primary level – in comparative terms, similar to their mathematics performance. However, participation in TIMSS in 2011 and 2015 has highlighted that the scientific achievement of primary-level students in Ireland (although significantly above the international average) is relatively poor compared to their mathematics achievement and the science performance of post-primary students in Ireland (Clerkin et al., 2016; Eivers & Clerkin, 2012).

ICCS and TALIS have generated data on other aspects of the Irish education system beyond these 'core' or traditional academic domains. The civic knowledge of Irish post-primary students was found to be among the highest of all participating countries in ICCS 2009 (significantly lower than only four countries, and significantly higher than 24 countries) (Cosgrove, Gilleece & Shiel, 2011). This study also provided interesting information on students' views on political and social issues, and on how the school can contribute to their development as young citizens. The most recent iteration of ICCS took place last year, in 2016; however, Ireland did not take part. TALIS, unusually, focuses on teachers rather than

students. The data arising from Ireland's participation in TALIS 2008 provided a clear and detailed picture of teachers' qualifications, professional developments, attitudes, beliefs, and teaching practices, and how they differ in Ireland compared to other countries (Gilleece, Shiel, Perkins & Proctor, 2009). As with ICCS, Ireland did not participate in the most recent cycle of TALIS, which took place in 2013. However, a detailed picture of Ireland's teachers, with international comparisons, is available via TIMSS.

Although they attract much of the popular interest, 'league table' comparisons of one country's performance versus another on a single specific indicator, as described here, are arguably among the least interesting types of information to emerge from ILSAs. Indeed, prior to the 1990s, the IEA and OECD used to warn against such comparisons (Addey, Sellar, Steiner-Khamsi, Lingard & Verger, 2017). Although a country might be described as 'high-performing', 'average', or 'low-performing' on the league table-style rankings that often appear, it is questionable how useful these rankings are, in themselves, to informing education policies.

From the perspective of forming and adapting educational policy, the more relevant information arising from ILSAs often comes from examining differing patterns of achievement in relation to students' characteristics and their experience of school and the education system – and, where possible, in observing changes in performance over time. TIMSS and PIRLS, in particular, are designed specifically for the purpose of monitoring improvements or deteriorations in student achievement over time (trends in Irish students' performance in recent years will be discussed below in the context of changes in national educational policy). Information on the patterns of achievement within a country – that is, which students achieve higher or lower scores on the test – can be exceptionally valuable to educators and policy-makers. The questionnaires that are administered alongside the tests in many ILSAs allow us to examine differences in achievement in light of a range of relevant factors including, among other things, by location (e.g., provinces, or urban vs rural areas), teachers' training and practices in the classroom, the schools' level of resourcing, students' socioeconomic background, the education or occupation of their parents, their attitudes towards school and learning, their status as native or other-language speakers, and gender.

To take one example, ILSAs have shown that, internationally, girls tend to achieve much higher scores than boys on reading assessments, at both primary and post-primary levels, but that gender differences are generally much smaller (and often negligible) for mathematics and science. The extent of these differences varies across countries, with girls

doing better than boys in some countries and boys doing better than girls in others. Once a difference such as this has been found, it can then be examined further within the national context by bringing in additional information from the same students, such as gendered differences in students' attitudes towards learning or towards particular subjects, educational policies that promote different educational outcomes for girls and boys, or differences in the types of activities that girls and boys engage in at home or in school that could lead to differences in achievement (see, e.g., Eivers & Clerkin, 2013). Given the current setting, it may be noted that recent cycles of PIRLS, TIMSS, and PISA have consistently found that the gender differences reported in various Gulf Cooperation Council nations (with girls almost always outperforming boys) are among the largest in the world.

Policy-making in Ireland via the findings of international assessment

It is likely that Ireland's participation in TIMSS 1995 and an earlier study, IAEP II (the *Second International Assessment of Educational Progress)* in 1991 (Martin, Hickey & Murchan, 1992) contributed to revision of the Irish primary school curriculum in 1999. The 1999 curriculum upgraded the previous (1971) curriculum in part by substantially broadening the scope of the content and skills expected to be taught in science lessons, which may be related to having greater direct exposure to international practices and norms (Oldham, 2003). (Incidentally, the 1999 curriculum is still in place, and more recent participation in PIRLS in 2011, and TIMSS in 2011 and 2015, has highlighted that the primary-level reading, mathematics and science syllabi in Ireland are now among the oldest of those in any participating country. The mathematics and reading syllabi for primary students are currently under revision.)

Following TIMSS 1995, Ireland did not take part in TIMSS again until 2011, meaning that, from 2000, PISA became the most prominent international assessment in Ireland.[4] Its impact on Irish policy-making was relatively low-key initially, with the first three cycles mainly serving to "confirm the prevailing view of a high-quality Irish education system" with "little deeper reflection on PISA's overall contribution to the assessment of Irish educational performance" (Finn, 2012, p. 8).[5] This changed in 2010, when the results of PISA 2009 were published, showing an apparently dramatic decline in students' literacy and numeracy performance. Subsequent cycles of PISA have shown that reading and mathematics

[4] As of August 3rd, 2017, searching the Department of Education and Skills' website (www.education.ie) for the term "PISA" yields 51 results, whereas "TIMSS" yields 25 results. "ICCS", by contrast, returns only one result – a press release accompanying the launch of the national report in 2010.

[5] But see below regarding the introduction of a revised mathematics curriculum at post-primary level.

achievement 'rebounded' in 2012 and 2015 to levels similar to those reported in 2000, 2003, and 2006, suggesting that the (much lower) 2009 results should be interpreted cautiously.[6] However, the publication of the PISA data in 2009 drew an immediate response, both publicly, in media commentary, and politically, by policy-makers. The response can be compared to similar 'PISA shocks' that have occurred in other countries where the results have been lower than expected (most famously, in Germany). The most visible manifestation of the government's response was the *National Strategy to improve literacy and numeracy among children and young people* for the period 2011-2020 (Department of Education and Skills, 2011b).

Although public consultation on a draft strategy had begun in November 2010 (Department of Education and Skills, 2010), prior to the publication of the PISA 2009 results in December 2010, the completion of the *Strategy* in its final form was given momentum by the PISA findings and the critical media attention that followed (Hislop, 2011; see also Sheehan, 2016). The *Strategy* document was, in large part, a response to the findings of previous *national* assessments of students' reading and mathematical skills at primary level, which had shown no significant changes in student achievement since the 1980s, but also explicitly cited the declines reported in PISA 2009 as a cause for concern. The *Strategy* set specific targets for student performance in subsequent cycles of PISA and national assessments, and also mandated Irish participation in future iterations of PISA, TIMSS and PIRLS in order to allow the achievement of Irish students to be benchmarked and compared against the performance of their peers in other countries.[7] It also included a range of other reforms that were intended to promote stronger literacy and numeracy skills in schools. These included extending the duration of initial teacher education courses; ensuring that initial teacher education included a greater focus on literacy and numeracy; increasing the literacy- and numeracy-related training of early childhood care and education practitioners; introducing more rigorous target-setting and self-evaluation of literacy and numeracy outcomes in schools; supporting the development of strong school leadership; providing greater supports to students with additional learning needs and students facing educational disadvantages; and reviewing and revising syllabi related to languages (English and Irish) and

[6] Subsequent commentary has also urged caution in interpreting the results of PISA 2009 in Ireland because of reservations over the statistical methods used to link across cycles and to estimate linking error, as well as poor levels of engagement with the test, and changes to the content of the assessment (Cosgrove, 2011; Cosgrove & Cartwright, 2014). Cosgrove and Cartwright (2014) described Ireland's PISA 2009 results as representing a 'perfect storm' that confounded real changes in achievement with extraneous factors.

[7] By this time (the *Strategy* was published in July 2011), the administration of the PIRLS and TIMSS 2011 assessments had already been completed, but the results had not yet been published.

mathematics. The *Strategy* also advised that the amount of instructional time devoted to teaching literacy and numeracy was to be increased.

The results of TIMSS 2015 (Clerkin et al., 2016), as well as a national assessment of reading and mathematics carried out in 2014 (Shiel, Kavanagh & Millar, 2014), provided some encouraging initial indications on the effects of the *Strategy*. At primary level, Shiel et al. reported significant improvements in reading and mathematics performance in the target grades (Grade 2 and Grade 6) compared to the previous assessment in 2009. Similarly, the results of TIMSS showed that student achievement in both mathematics and science in Grade 4 was significantly higher in 2015 than was found in 2011. The results of PIRLS 2016, which are due to be published in December 2017, will provide an interesting comparison with regard to any changes in Grade 4 students' reading achievement.

At post-primary level, the evidence is slightly less clear because the most recent trends available for Grade 8 students relate to TIMSS 1995, and therefore cannot be said to clearly reflect any recent changes in policy.[8] Nonetheless, science achievement was found to be significantly higher in 2015 than was the case in 1995. Almost all of the overall improvement was attributable to a large improvement in girls' science achievement, which may be related to an increase in uptake of science by girls at lower secondary level in recent years. In contrast, over the same period, students' mathematics achievement improved slightly but not significantly. The difficulty of interpreting trends at such a distance – with twenty years between the two cycles – is that it is possible that student' mathematics achievement improved after 1995 and has since declined, or that it declined after 1995 but has since improved, or perhaps that it has been very stable for the last 20 years. Participation in upcoming cycles will enable future policy to be informed by more current trends.

The generally positive findings of recent studies led to a re-evaluation of the targets set out in the *National Strategy, 2011-2020* (Department of Education and Skills, 2017). The re-evaluation acknowledges that progress has been made, but highlights some recurring weaknesses that need to be addressed. These include relative weaknesses in aspects of mathematics content (geometry, shape and space, and measures), in mathematical reasoning and problem-solving skills, and in scientific content related to physics and chemistry. The need to take steps to enhance girls' confidence and interest in engaging with mathematics has

[8] PISA also reports scores for each domain within each cycle, but, for several reasons (including changes in the definition and operationalisation of constructs, reliance on a small number of linking items, changes in the scaling procedures used to calculate and link scores, changes in the mode of administration, and variation in the stability of links between cycles), TIMSS and PIRLS provide more reliable estimates of *trends* over time.

also been noted. Concerns over mathematics education in Ireland have been increasingly raised by commentators since the early 2000s, driven in part by economic and political perceptions of deficiencies in students' higher-level thinking and by relatively moderate results in the early rounds of PISA (see Conway and Sloane, 2006). These concerns contributed to the introduction of a revised mathematics curriculum at post-primary level, known as Project Maths, which was initially piloted in 2008 and implemented nationally on a rolling basis from 2010-2015. The aims of Project Maths include fostering positive attitudes towards mathematics and developing the ability to solve problems and to use mathematical concepts in applied contexts (Department of Education and Skills, 2011a), in part aimed at addressing the weaknesses noted above. As the rollout of the new curriculum has now been completed, future cycles of TIMSS and PISA will be viewed with interest as policy-makers begin to look for evidence of improvements in students' mathematical achievement.

In addition, trend data from the national assessments, TIMSS, and PISA have shown that the performance of lower-achieving students in Ireland has improved in recent years and that relatively high percentages of students in Ireland, compared to other countries, meet basic and intermediate international benchmarks of performance. This may be related to the introduction in 2005, by the Department of Education, of a large-scale national programme known as DEIS (*Delivering Equality of Opportunity In Schools*) providing targeted supports to schools serving large concentrations of socioeconomically-disadvantaged students.[9] Schools that were part of the DEIS scheme received favourable student:teacher ratios, access to home-school community liaison services and free meal schemes, funding for school books, professional development opportunities and access to support services, and access to specialised literacy and numeracy programmes. Evaluations of the outcomes of the DEIS scheme, which are ongoing, suggest that it has been effective in raising the achievement of the lowest-performing students which, as noted above, aligns with the findings of recent ILSAs.

However, the performance of the highest-achieving students in Ireland has not increased to the same degree and there are relatively few Irish students who meet the highest international benchmarks. In other words, students in Ireland appear to achieve at a relatively high standard at the lower and intermediate ends of the distribution of performance, and their performance has improved in recent years, but this is somewhat blunted at the upper end of

[9] DEIS superseded older programmes that were also aimed at existing educational disadvantage, representing a renewed effort grounded in research evidence on the characteristics of effective interventions.

the distribution. The updated *National Strategy* (Department of Education and Skills, 2017) therefore includes a commitment to raise the achievement of the highest-performing students and to focus on teaching higher-order thinking skills (such as problem-solving) more generally at all levels of the education system.

Although much of the discussion surrounding ILSAs focuses on results in reading, mathematics, and science, studies such as ICCS can also play a role in progressing public debate. Ireland took part in the IEA's first study of civic and citizenship education in 1971, which found that Irish students at that time reported a relatively simplistic view of society and knew less about politics than students in other countries (Cosgrove & Gilleece, 2012). Subsequently, a dedicated citizenship education subject, known as CSPE (*Civic, Social and Political Education*) was introduced in 1997 as part of the core suite of subjects for all students at lower secondary education (National Council for Curriculum and Assessment, 2005).[10] A quasi-gap year between lower secondary and upper secondary education, known as Transition Year, is also often used as an opportunity to encourage students to engage in community activities and to educate students by interacting more directly with the world outside school (Clerkin, 2012). This programme was introduced in the 1970s and has become increasingly popular since the early 1990s (Clerkin, 2013a). In 2007, a report issued by a specialised Taskforce on Active Citizenship (2007) recommended strengthening the CSPE programme at lower secondary level, supporting active community-based learning in Transition Year, and introducing a citizenship programme as an examination subject at upper secondary level. The Taskforce also recommended Ireland's participation in the ICCS 2009 study. The results of ICCS showed that Irish students performed comparatively well on a test of civic knowledge, but also raised some concerns about differences in students' knowledge and civic engagement related to sociodemographic factors (Cosgrove et al., 2011). Most recently, a Politics and Society subject was introduced at upper secondary level in September 2016, to be examined for the first time in 2018 (Department of Education and Skills, 2016). Although brief, this review demonstrates how participation in international studies on civics education in 1971 and 2009 has contributed – albeit slowly, and in conjunction with other factors – to informing the development of educational policy and practice in Ireland in an often-neglected domain of learning.

Cautions in interpreting and using the findings of international assessments

[10] Replacing a previous 'civics' course which was, in practice, often ignored in schools, with its time allocation given to other subjects (Murphy, 2003).

There are many published critiques of the limitations of ILSAs – both as a field in general and of particular studies – as well as many helpful pedagogical articles that are aimed at promoting responsible, informed, and constructive use of ILSA data. Policy-makers wishing to use the results of international assessments to inform policy in their country should, at a minimum, be aware that there are several factors that can play a role in cross-national comparisons of performance on ILSAs beyond students' core knowledge of the domain ostensibly being tested. Among the issues identified are differences at country level (the extent to which students are excluded, the representativeness of the defined target population, varying response rates), student level (differences in test motivation and engagement, and in response style and willingness to guess answers), and differences arising from the translation and adaptation process (varying conceptual fidelity, and increases in reading difficulty and/or test length arising from the translation).

These factors mean that comparisons between countries – especially countries from a different cultural or linguistic background – are not straightforward and should be attempted cautiously. For example, Eivers (2010) describes how an improvement in Korean students' reading literacy between 2003 and 2006, which was ascribed by the OECD and Korean authorities to a new curriculum, could just as easily be a result of simply administering the test to a more representative sample of students in 2006 (in previous cycles, girls, who outperformed their male counterparts on reading literacy, had been under-represented in the Korean data). Interested readers are invited to consult Baird et al. (2016), Baird, Andrich, Hopfenbeck and Stobart (2017), Eivers (2010), El Masri, Baird and Graesser (2016), Finn (2012), Oldham (2003), Pizmony-Levy et al. (2014), and Rutkowski and Rutkowski (2016), among others, for more extended critiques of the rationale, implementation, and interpretation of ILSAs.

Among the other caveats to be noted are that studies like TIMSS and PISA are cross-sectional in nature and therefore should not be used by themselves to infer direct causal relationships between any particular characteristics or policy and a student outcome. Results reflect students' accumulated experience of the education system and broader society across their entire lives rather than simply their experiences in (e.g.) Grade 4 or Grade 8. Further, comparisons across different studies must take account of differences in the conceptualisation and operationalisation of the intended outcome and differences in administration (e.g., grade-based vs age-based sampling, paper-based vs computer-based administration, curriculum-linked vs curriculum-free assessment frameworks), and, importantly, the often-overlooked

fact that the achievement scores reported by ILSAs are *estimates* with an inherent level of uncertainty.[11] The uncertainty in estimated scale scores is a function of the methodology used,[12] but becomes a problem when it is ignored (as it often is) by commentators and policy-makers.

In using the information gathered through participation in ILSAs, policy-makers must be careful to do so appropriately, to ensure that the findings are interpreted correctly and used appropriately. This has often not been the case in public debate, where the measured constructs under discussion are regarded in simplistic and absolute terms rather than as imperfect estimates of complex cognitive processes. Rutkowski and Rutkowski (2016) endorse the value of international assessments but urge caution in the use of their results, believing that "restraint commensurate with the level of influence should be exercised by all parties when interpreting results and making policy recommendations" (p. 256). They call for the OECD to adhere to higher standards in acknowledging and documenting the limitations of PISA than has been apparent in previous cycles, and also advise researchers to use the data responsibly (on the latter point, see also Jerrim, Lopez-Agudo, Marcenaro-Gutierrez & Shure, 2017). Similarly, Addey et al. (2017, p. 6) note how "policies developed in relation to ILSA data are not necessarily informed by careful analyses of the data, but instead draw on average scores and rankings to construct political narratives that legitimise reform or the status quo."

The media coverage following the publication of PIRLS and TIMSS 2011 results in Ireland provides an illustration of how ILSAs can be used to construct political narratives. Newspaper headlines claimed that a "world-class system [was still] some way off"[13] and that Irish schools were "failing to prepare kids for the jobs of the future".[14] The latter story also included a quote from an employers' advocacy group stating that "our performance could, at best, be described as average" – despite the fact that Irish pupils' performance in all three measured domains was statistically significantly above average. Narratives such as these can

[11] For example, this means that students in three hypothetical countries might have average scores of 482, 481, and 480, which – if taken at face value – appear to define a clear ranking of 'higher' and 'lower' performance. However, when the appropriate level of uncertainty accompanying these estimates (described by a statistic called the *standard error*) is taken into account, we might see that the *true score* for each country falls within the range 477-485. The three countries are therefore, in fact, statistically indistinguishable from each other.
[12] The methods used by ILSAs generally involve sampling a representative subgroup of students from the overall population (rather than giving the test to everyone) and administering only a part of the whole test, usually lasting 1-2 hours, to each student (rather than the entire pool of items, which might take days to complete). These methods contribute to *sampling error* and *measurement error*, which are accounted for by the standard error statistic.
[13] www.irishtimes.com/news/hope-of-world-class-system-some-way-off-1.2389
[14] www.independent.ie/life/family/learning/were-failing-to-prepare-pupils-for-jobs-of-the-future-28946482.html

be used to justify or provide impetus to reform agendas and policy decisions (such as increasing the amount of time spent teaching literacy and numeracy) that pre-date the findings of a particular study.[15] Importantly, the *distribution* of achievement across the student population often goes unremarked in such discussions, being overshadowed by the population *average* (or worse, by the country's 'ranking'). This is one example of the way in which the presentation of ILSA results as a league table of country averages "often conceals more than it reveals" (Oldham, 2003, p. 2) by facilitating explicitly political (rather than educational) uses of the data. The use of contextual information alongside achievement scores provides a route to attaining more nuanced and focused uses of ILSA data.

A second key point that should be recognised is that any given ILSA does not measure the success of an education system as a whole. ILSAs measure narrowly-defined skills or areas of study (e.g., reading, mathematics, science) using short standardised tests. Most education systems set out to develop many other areas of learning and development – for example, creativity, wellbeing, moral or character education, collaborative and self-regulatory skills, languages, art, music – that never feature in ILSAs. Acknowledging this allows the results of ILSAs to be used to inform policies, while remaining cognisant of other educational priorities. However, this is a point that is often forgotten in public commentary, where the results of ILSAs are often taken to be the defining marker of an education system. In so doing, there is a risk that consideration of other outcomes may be pushed aside in favour of those that can be more easily measured by existing assessments. Similarly, the role of factors outside the formal education system, such as the home environment and students' participation in extra tuition outside school (as is common in some countries), is often overlooked.

One relatively clear example of the effects of prioritising certain outcomes over others can be found in Ireland. As noted above, the *National Strategy, 2011-2020* (Department of Education and Skills, 2011b) increased the amount of instructional time devoted to teaching literacy and numeracy in the classroom. This is reflected in teachers' reports in TIMSS, where the amount of time spent teaching mathematics in primary classrooms was substantially higher in 2015 than in 2011 (Clerkin, Perkins & Chubb, in press). However, this was accompanied by a halving in the amount of time spent on science teaching, from 63 hours per year to 32 hours, meaning that Grade 4 students in Ireland now spend less time on science than their peers in any other TIMSS country (from an already low base). Although

[15] www.irishtimes.com/opinion/teaching-time-at-primary-level-1.2971

data on other subjects are not available from these studies, it seems reasonable that other areas of learning might also have seen decreases in their time allocation in order to make way for literacy and numeracy teaching. The *Strategy* (Department of Education and Skills, 2011b) suggests that such an outcome might be tolerated in order to prioritise the "core skills of literacy and numeracy" (p. 14) over other "desirable but ultimately less important activities" (p. 15), in light of the resources available to schools.

This example illustrates some of the potentially negative implications of basing policy on ILSA results (i.e., reduced attention to primary level science arising, in part, from apparently poor reading and mathematics results at post-primary level) while simultaneously illustrating the benefits of gaining the broader contextual information that ILSAs provide. In other words, we know that the time spent teaching science has decreased to this degree only *because* questions about science instructional time were asked through repeated participation in TIMSS. It is conceivable that having these data could lead to a re-balancing in the amount of time spent on science in primary classrooms in future. In contrast, no similar data are available on the amount of instructional time devoted to artistic pursuits or to learning about history, making it less clear how subjects such as these tend to be affected by education policies framed by ILSAs.

Conclusion

There are many important aspects of a child's education that are not captured by ILSAs. It is important not to assume that the most (or only) important things are those which have been measured to some degree of precision, and I would not advocate for policy reforms driven solely by a political desire to improve a country's performance on large-scale international assessments. Nonetheless, ILSAs do provide high-quality data and useful information that can provide deep insights into specific aspects of an education system, if they are used appropriately. The data arising from these studies can include issues as diverse as students' lack of sleep and inadequate nutrition affecting their ability to learn in class (Clerkin & Creaven, 2013), the nature of interactions and communication between the school and students' parents or guardians (Eivers & Creaven, 2013), teachers' confidence in teaching certain topics, their professional development, and teaching practices (Clerkin, 2013b), or detailed analyses of particular items on which students have performed unusually well or poorly in light of the local curriculum and context (Close, 2013).

Perhaps the most important point to take away is that education policy should take a broad view and be based on an accumulation of evidence, rather than blindly following the

narrowly-defined results of individual studies as they arise. Irish participation in TIMSS and PIRLS has provided a body of information on various aspects of the Irish system as it compares to other countries in Europe and further afield; these studies also provide a perspective on educational outcomes that is separate to those acquired through participation in PISA, and the comparisons that it provides. All three of these international studies, alongside long-standing national programmes of research, are referenced in the Irish education ministry's strategy for improving literacy and numeracy outcomes in the coming years (Department of Education and Skills, 2011b, 2017). The findings of previous Irish participation in ICCS and TALIS also continue to be valuable reference points for researchers, unions, and advocacy groups. Ireland's continued participation in these studies should help to produce an expanded evidence base and allow for more refined analysis and policy formation in future.

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