



How have PISA results informed education policy discussions and affected policy in middle-income countries?

This chapter explores the extent to which the Programme for International Student Assessment (PISA) has informed education policy in middle-income countries. The first section of the chapter provides a brief review of the education policy process, drawing attention to the important role of discussion and debate in goal-setting and policy formulation. The second section presents new empirical evidence regarding education policy discussions in middle-income countries participating in PISA, drawing from the analysis of media in middle-income case study countries. The third section reviews the evidence of education policy reforms in these countries and their linkages with PISA, drawing on reviews of donor support for assessment, the use of PISA in general policy dialogue, and the use of PISA in identifying specific policy issues related to the quality and equity of education systems. The fourth section examines the evidence related to PISA's impact on policy agendas and country-level reforms. A final section presents conclusions and implications.



INTRODUCTION

The OECD says that PISA “offers insights for education policy and practice” and that its results allow policy makers around the world to “learn from policies and practices applied elsewhere” (OECD, 2014). Research evidence indicates that high-income OECD member countries have responded to PISA results by seeking to learn from the experiences of other countries (Breakspear, 2012; Dixon et al., 2013; Heyneman and Lee, 2014; OECD, 2011). These same sources indicate that PISA has played an increasing role in the educational research literature in high income countries. Less evidence is available for middle-income countries that participate in PISA and it is unclear whether or not PISA has offered insights for education policy and practice in these countries, and if such insights have affected education policy.

This chapter explores these issues in three sections. First, it provides a brief review of the education policy process, drawing attention to the important role of discussion and debate in goal-setting and policy formulation. Second, it presents new evidence regarding education policy discussions in middle-income countries participating in PISA. Third, it reviews the evidence of education policy reforms in these countries and their linkages with PISA. Policy reform is not spontaneously generated, but is the direct outcome of both public discussions (in various media, for example) and private discussions (between ministers of education and international donors, for example). This chapter reviews the evidence regarding these discussions first.

THE EDUCATION POLICY PROCESS

There are many definitions¹ of education policy, but most definitions include two separate features: values and actions. Values inform statements of general intent, while actions are specific procedures. For example, forty years ago, Kogan (1975) observed that policies are “operational statements of values.” Two years later, Jennings (1977) presented an influential “linear” model of policy development: evidence of a problem emerges, opinions about the problem crystallise around specific options, policy options are presented formally, further discussion around options occurs, policy makers select the key policy options, and administrative procedures are developed that operationalise the policy (Bell and Stevenson, 2006). The media are particularly important in focusing public opinion around issues, or “agenda setting” (McCombs and Shaw, 1972). The education reform process has been described in terms of agenda setting, reform design, reform adoption, reform implementation, and institutionalisation (Grindle, 2004).

Bell and Stevenson observe that “what is often presented as a policy is frequently no more than a statement of intent, a plan of action or a set of guidelines” and that “policy is about the power to determine what gets done, or not done” (Bell and Stevenson, 2006). In other words, “policy...can be seen as both operational statements of values and as the capacity to operationalise values through the ability to exert influence at key points” in policy development (Bell and Stevenson, 2006: 23).

In recent years, international values in education have been formalised through various declarations and goal statements that have focused on improving access to education and improving the quality of education. For example, the Jomtien Education for All (EFA) goals included achievement of universal access to learning, a focus on equity, and an emphasis on learning outcomes. The Millennium Development Goals (MDGs) for education included goals of achieving universal primary completion and eliminating gender gaps in enrolment at all levels of education. The Sustainable Development Goals (SDG), and associated targets for education, seek to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Improving learning outcomes – the skills needed for employment in the 21st century² – has moved from being one of several goals to being a central education goal of “quality education.” PISA and other international large-scale assessments document shortcomings in “quality education” and hence provide empirical evidence of problems to be resolved through public policy. Governments in most countries have considered a wide range of policy options and have implemented actions designed to ameliorate these problems. Some of these policy options are contested and are subject to public debate.

PUBLIC MEDIA DISCUSSIONS OF EDUCATION POLICY

It is unclear how much public debate and discussion of education and education policy takes place in middle-income countries, and how much evidence exists that public discussions of education policy are related to PISA. Public discussions can occur both in media targeted at a wide range of stakeholders, such as television or newspapers, and in publications targeted at academic audiences, such as professional journals. They can also occur in a wide range of non-print media, such as blogs or emails.

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Prior research on public discussions has generally focused on print media in high-income OECD countries. For example, research on the press coverage of PISA 2006 showed a sharp increase in the number of articles published in December 2007, following publication of the PISA 2006 results, but this research was limited to four OECD countries: Finland, France, Germany and the United Kingdom (Dixon et al., 2013). Academic literature is much more likely to study education policy and examine the PISA data in detail, but again most research has focused on high-income and OECD countries. For example, among 1590 academic journal articles and book chapters referencing both “PISA” and “education policy” published in the first three quarters of 2015 and accessed through Google Scholar,³ only 39 (2.5%) also referenced “developing countries.”

References to PISA in the media often mention the assessment results but provide no further information. For example, Figazzolo (2009) notes that “out of about 12 000 articles published at worldwide level between December 2007 and October 2008 [mentioning PISA], around 40% make a simple reference to PISA 2006, without further explanation [and] around 30% of the articles make a reference to PISA results in order to advocate for reforms without even analysing what these results mean.” Only about 2-3% discussed specific evidence for the suggested reform.

The research reported in this section of this chapter is drawn from Shadrova (2015)⁴ and extends these prior analyses by: *i*) focusing on middle-income countries that have participated in PISA; and *ii*) examining references to specific education policy terms, rather than only the term “PISA.” This new research is consistent with prior research as it focuses on print media.

The research identifies the changes in the frequency that specific education policy terms appeared in major newspapers in the nine low- and middle-income case study countries (Brazil, Bulgaria, Colombia, Georgia, Indonesia, Jordan, Kyrgyzstan, Turkey, and Viet Nam⁵), following publication of PISA results in the country. The Shadrova (2015) study, commissioned for this chapter, is the first systematic investigation of the public dialogue about PISA and specific policy reforms for low- and middle-income countries. It finds statistically significant relationships between one or two individual educational policy terms and relevant PISA cycles in the publications of Brazil, Bulgaria, Colombia, Turkey and Jordan, but not in Kyrgyzstan. The databases built for Georgia and Viet Nam could not be used due to technical reasons.

Methodology⁶

Publications of record for each of the nine case study countries were identified manually, partly through contacting representatives of the countries involved or experts, and through selecting the largest and oldest archives in each language. The 3 publications with the largest circulation⁷ in each country were identified, yielding 27 sources altogether. These publications are listed in Table 5.1; they are generally print publications that have been archived on line.

A list of approximately 75 education policy-related terms based on OECD classifications and the literature regarding education policy was developed and translated into the 9 target languages, using 5 different scripts, and yielding approximately 750 searchable terms. The terms were related to specific policies that could be implemented by governments to improve learning outcomes. In some cases, a term could not be translated into one of the languages.

— Table 5.1 —
Publications searched for discussion on education, by country, 2000-14

Country	Publication title (transliterated as needed)	Dates of archives (varies by publication)	Number of analysable policy terms
Brazil	Folha de S. Paulo, Veja, O Estadão de S. Paulo	2000-2014	10
Bulgaria	Dnevnik, Dneven Trud	2000-2014	9
Colombia	El Tiempo, El Espectador	2000-2014	10
Georgia ¹	Civil.ge, Georgian Times, newsgeorgir.ru	Excluded	0
Indonesia	Koran Tempo, Tempo, Kompas	2000-2014	10
Jordan	Al Ghad, Ad-Dustour, Al Rai	2000-2014	12
Kyrgyzstan	Delo, Radio Azattyk	2008-2014	6
Turkey	Zaman, Sabah, Haberturk, Hurriyet	2000-2014	7
Viet Nam	Five websites	Excluded	0

Note: Table includes only those terms with observed frequency within a publication equal to or greater than 20 in 2014.

1. Georgia was excluded due to an insufficient number of terms that could be found, and Viet Nam was excluded because the standardisation procedure could not be applied.

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These terms were grouped into six broad categories; the first four drawn directly from the OECD and the last two reflecting concerns of educators: *i*) selecting and grouping of students; *ii*) resources invested in education (other than teachers); *iii*) resources invested in instructional staff; *iv*) school governance, assessments and accountability; *v*) curriculum and instruction; and *vi*) student learning outcomes.

Each publication was searched for the occurrence of all specified terms using the Google search engine. The frequency of mention of the individual education policy terms in each of the publications was computed for the years 2000 to 2014 (for Kyrgyzstan, only publications 2008-14 were available). Each term's frequency of occurrence was standardised by dividing the frequency of the term by the most frequently occurring term in the particular language for that year and publication (typically words such as "the" or "and"), to produce a "relative frequency" for each term for each year and publication. The last column of Table 5.1 reports the number of education policy terms with relative frequencies sufficient for analysis.

The 19 education policy terms that occurred with sufficient frequency for analysis are identified in Box 5.1. These are (within each group as numbered above): 1) selecting and grouping students (compulsory schooling, mandatory schooling, gifted education, age at school entry, and equality of opportunity); 2) resources invested in education (pre-primary education, length of school day); and 6) student learning outcomes (academic performance, student performance, mathematics achievement, science achievement, reading achievement, mathematics literacy, science literacy, reading literacy, proficiency levels, mathematics proficiency, science proficiency, reading proficiency, competencies). None of the remaining terms that were related to the other three policy categories – 3) resources invested in instructional staff; 4) school governance, assessments and accountability; and 5) curriculum and instruction – occurred with sufficient frequency for analysis. The general terms "students", "teachers", "schools," and "education" were mentioned frequently and were also analysed. Not all terms occurred in every country.

Box 5.1 Education policy terms

1. Selecting and grouping students

- **Compulsory education**
- **Mandatory schooling**
- **Gifted education**
- **Age at school entry**
- **Equality of opportunity**

At-risk students
Grade repetition
Academic tracking
Vocational programmes
Ability grouping
Elite secondary schools

2. Resources invested in education (other than for teachers)

- **Length of school day**
- **Pre-primary education**

Public expenditure on education (budget for education)
Non-salary expenditures on education
Private expenditure on education
School infrastructure
Instructional materials
Textbook availability
Computers/IT availability
Instructional time
Length of school year
Class size
After-school tutoring
After-school lessons

3. Resources invested in instructional staff (not separated in PISA reports)

Teachers' starting salaries
Teacher salary increases
Pre-service teacher training
Requirements to enter the teaching profession
Student-teacher ratio
Teacher professional development
School head professional development (principal, headmaster, etc.)
Female teachers
Teacher unions

4. School governance, assessments and accountability

School autonomy
Appointing teachers (selecting teachers)
Dismissing teachers (firing teachers)
Formulating school budgets
Allocating budget resources within school
School choice
Private schools
Management training
Parental involvement
National assessments
Examinations
Standardised tests
Classroom assessments
Teacher assessments

5. Curriculum and instruction (not in PISA report)

Curriculum reform
Student-centred teaching
Textbook selection
Course offerings
Duration of compulsory schooling
Duration of pre-tertiary schooling
Course content
Opportunity to learn
Inquiry-based learning

6. Student learning

- **Academic performance**
 - **Student performance**
 - **Mathematics achievement**
 - **Science achievement**
 - **Reading achievement**
 - **Mathematics literacy**
 - **Science literacy**
 - **Reading literacy**
 - **Proficiency levels**
 - **Mathematics proficiency**
 - **Science proficiency**
 - **Reading proficiency**
 - **Competencies**
- Educational achievement
Skills
Knowledge and understanding
Equality of outcomes
Benchmarks

Note: Bulleted terms in bold occurred frequently enough for analysis in any country.



For each country, three statistical measures were applied. These assessed the relationship between: *i*) the frequency with which the term occurred in the years before, during and after the publication of the country's PISA results, taking into account the different schedules for PISA Plus cycles; *ii*) peaks in term frequencies in the years around the release of PISA results; and *iii*) the correlation among terms within publications. The release of the international results always takes place in December of the year following the collection of data, which is the year referred to in the name of each cycle. For example, data for PISA 2012 was collected throughout 2012 but the international report was not released until December 2013. Statistical differences reported below are $p < .05$ or better.

Shadrova (2015) notes some limitations of the study, including: reliance on Google, inability to compile a complete collection for each website, difficulties in translation terms, the differences among language typologies, and making cross-country comparisons. In addition, online media in some countries could not be accessed for the entire period (2000-2014), and in other countries the results were insufficient for analysis.

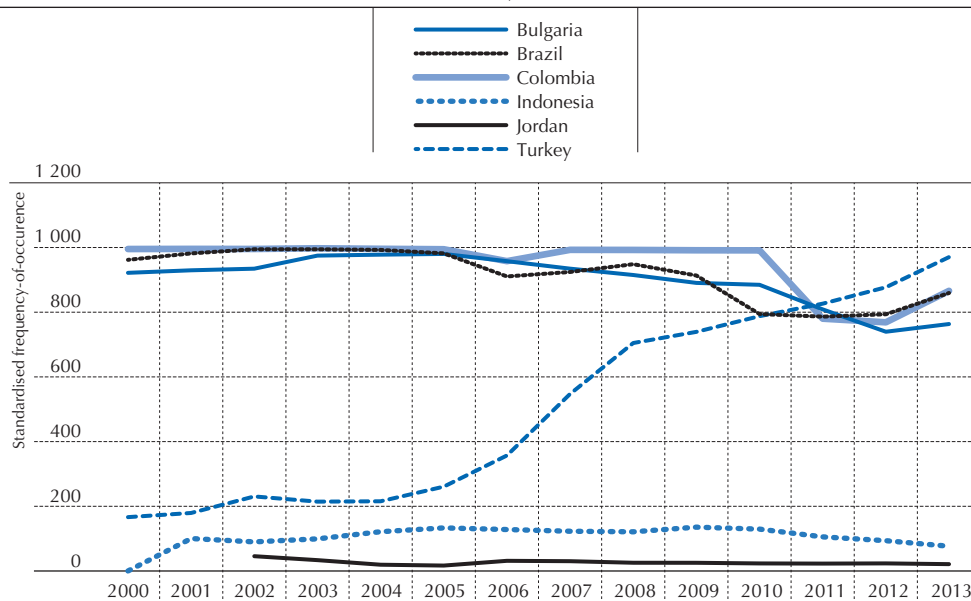
Public discussions of education policy in case study countries

Public discussion of education policy in the case study countries did not, in general increase between 2000 and 2014. This is the case for the overall term "education" and for specific education policy terms.

Discussion of "education" increased only in Turkey

The average frequency of occurrence of the term "education" in public media remained relatively stable in five of the six countries from 2000 to 2009, after which it declined slightly. Slight increases occurred after the release of PISA 2012 in Brazil and Colombia. Only one country – Turkey, an OECD member that was undertaking important education reforms beginning in the mid-2000s – showed a steady increase (Figure 5.1). Figure 5.1 presents all six countries on a single scale, but no cross-country comparisons should be made as standardisations are within country only and this figure does not demonstrate greater frequency of term use in Colombia, for example, than in Jordan.

Figure 5.1
Frequency of term "education" in newspapers
6 countries, 2000-14



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Discussion of learning outcome terms followed PISA cycle in four countries

Greater attention to student learning outcomes appears related to the PISA cycles. In four of the case study countries (Brazil, Colombia, Jordan and Turkey), statistical tests showed significant relationships between PISA cycles and one or two standardised individual terms, mostly related to student outcomes, in at least one publication. Some terms occurred more frequently during the year following the PISA release compared with other years: Brazil (2 of 10 terms),

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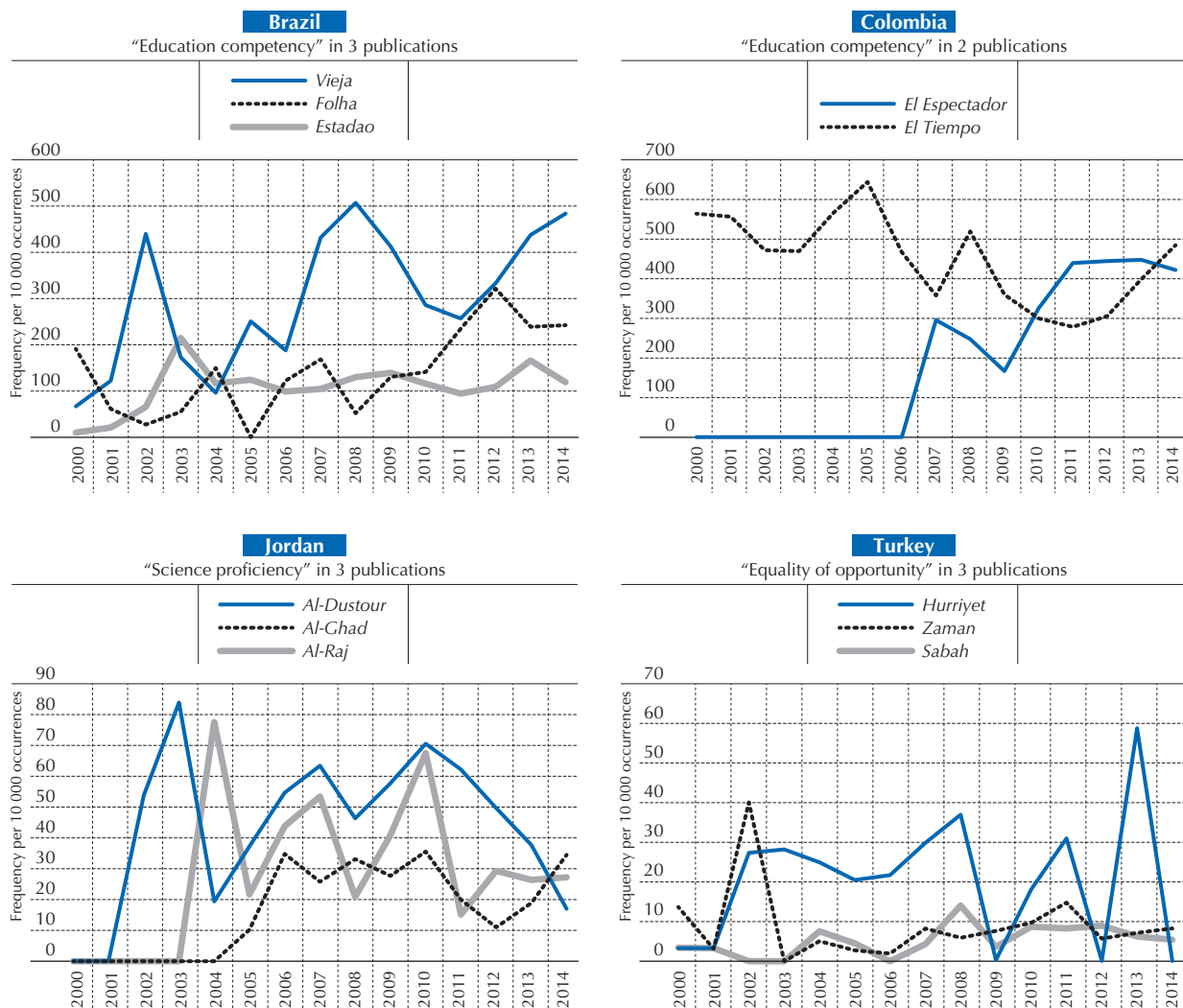
Colombia (3 of 10 terms), Jordan (4 of 12 terms) and Turkey (2 of 7 terms). In Kyrgyzstan, the online record was adequate to test only a few relationships, none of which showed any relationship between PISA and the public discourse on education. In Bulgaria only one term in one publication was significantly related to the PISA release. Data from Georgia and Viet Nam could not be analysed, as previously mentioned.

Figure 5.2 provides examples for four of the case study countries of the rise and fall of three specific terms related to student learning outcomes and equity: education competency, science proficiency, and equality of opportunity. Figure 5.2 also demonstrates that results from different publications within the same country were not consistent. In Brazil, Colombia and Jordan, the terms were observed more frequently in the year following the release of the PISA results compared with previous years. This was the case in at least one publication: “education competency” in Brazil (in *Vieja* only) and Colombia (in *El Espectador* only), “science proficiency” in Jordan (in *Al Ghad* only), and “equality of opportunity” in Turkey (no statistically significant relationship in any publication).

The figure shows each term’s frequency per 10 000 occurrences of the most common word in the various publications. Colombia and Jordan joined PISA for 2006 and Turkey joined for 2003, so observations of terms prior to that time are “non-PISA baseline” levels.

— Figure 5.2 —

Frequency of education terms in publications Brazil, Colombia, Jordan and Turkey



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Discussion of all education policy terms followed PISA cycles in some countries

Another way of looking at whether or not public dialogue about education was influenced by PISA results examined the peaks of all education policy terms taken together and whether these peaks corresponded to PISA cycles in the countries for which suitable data were obtained. No significant relationship between the frequencies of the entire set of policy terms and PISA was found overall, although for some countries a relationship was found for selected years (Shadrova, 2015).

For Colombia and Turkey, the peaks appeared to follow the release of PISA results. In Colombia discussions peaked in 2008, 2011 and 2014 – all approximately one year after the release of the international PISA results for the cycles in which Colombia participated: 2006, 2009 and 2012. Statistically significant relationships between peaks in relative frequency and PISA cycles were observed in *El Espectador*, comparing usage in the year after release of results to usage in other years. In Turkey, peaks were observed in the same years that the international results were released from PISA 2000, PISA 2003, PISA 2009 and PISA 2012. Statistically significant peaks in term usage were observed in *Haberturk*, comparing usage in the study year with usage in other years. Given the steady rise in discussions of education in Turkey over this time period, however, conclusions should not link this growth to PISA.

In Jordan, discussions were very active from 2003, but this may be related to the Trends in International Mathematics and Science Study (TIMSS) 2003, in which Jordan participated, rather than to PISA 2003, in which Jordan did not participate. Subsequent peaks in Jordan were observed in 2009, the year of the main study for PISA 2009, and in 2013, the year results from PISA 2012 were released.

Public discussion of education topics was also observed in Indonesia, which has a long history of participation in international assessments. Peaks in education terms were highest for 2004, the year the results of both PISA 2003 and TIMSS 2003 were released, and in 2012, the year that the results of TIMSS 2011 were released, but the differences were not statistically significant. In Indonesia and Brazil, significant differences were found for years that were entirely unrelated to the PISA cycles.⁸

Discussions of specific education policy terms did not generally follow PISA cycles

Public discussion of most of the individual education policy terms did not increase during the year immediately following the release of PISA in the case study countries compared with previous years. Across all countries, publications and PISA cycles, the years in which PISA results were released in the countries were not associated with increases in the frequency with which terms were mentioned in newspapers. While some terms rose and fell in three-year patterns that matched either the years that PISA results were released for each country or the years thereafter, the same was not true for the majority of terms. In addition, the term “OECD” did not occur more frequently the year after the PISA results were released compared to previous years in any of the countries. This is in sharp contrast to other studies that found an increased visibility of “OECD’s PISA” during the year following the release of PISA results in OECD countries.

No coherent clusters of policy terms

Another way of observing a coherent level of discourse about education policy was through the clustering together of education policy terms within publications. However, repeating clusters of term frequency correlations could not be found for any of the countries, suggesting individual differences by both country and publication rather than a fixed set of topics publicly discussed. In some publications in three countries there was an association between the term “OECD” and one or more policy terms: *i*) in Brazil, the terms “mathematics competency”, “equality of opportunity” and “preschool” had correlations greater than 0.40 with the term “OECD”; *ii*) in Colombia, the terms “education competence” and “mathematics competence” were correlated with the term “OECD”; and *iii*) in Turkey, the term “OECD” was correlated with all the following terms: “preschool”, “education competence”, “equality of opportunity” and “literacy” (Shadrova, 2015). With the exception of “preschool”, no specific policy term related to a policy reform was correlated with any other term.

Reports from countries emphasise PISA results, not policy options

For evidence from research to inform public dialogue about education policy it is necessary for the results to be widely disseminated, often through mass media such as newspapers, television, radio and online resources. Theoretical and empirical work indicate that “access to mass media empowers people politically” (Olper and Swinnen, 2013; Stromberg, 2001). In OECD countries, a great deal of dissemination of research related to education policy has taken place over the past 15 years, often peaking with the release of PISA or TIMSS. For the middle-income case study countries, however, direct evidence from the reviewed publications indicates substantially less public discussion of education policy topics.

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Country management teams for PISA 2015, who were interviewed in late 2014, reported that dissemination of PISA results had occurred. The national project managers for Bulgaria, Colombia and Viet Nam recalled that editorials and front-page articles had covered PISA results, and national teams from Brazil, Bulgaria, Colombia and Georgia all noted that PISA results were discussed in online blogs. They confirm, as is the case in many OECD countries, that public discussions focus on student learning outcomes (that is, PISA results) rather than on specific education policies that may be related to improvements in outcomes.

The next section of this chapter explores how PISA and other international large-scale assessments have influenced private dialogue between governments and international donors in the case study countries. International donors are singled out for this section because they play a large role in agenda setting for reform and because their dialogue is publicly available (Parks et al., 2015). This dialogue is typically focused on which education policies a country could consider adopting to improve learning outcomes.

PRIVATE DISCUSSIONS AND DIALOGUE BETWEEN GOVERNMENTS AND INTERNATIONAL DONORS

International large-scale assessments are used in three types of dialogue between donors and client countries: in general policy documents that do not target specific countries; in the identification of issues to be addressed through projects and programmes that often support policy reforms in specific countries; and in monitoring project and programme outcomes in these countries. Possibly as a consequence of this dialogue, donors have also provided financial support that has enabled countries to participate in international large-scale assessments. This section reviews donor support for assessment and the uses of assessment, and focuses on the experience of the World Bank, which is recognised as the largest development partner in education. It draws on several sources: *i*) previous reviews of World Bank projects, 1975-1993 and 1998-2009; *ii*) a review of World Bank project appraisal documents in education, 2009-2014, specifically undertaken for this report; and *iii*) World Bank implementation completion reports for selected earlier projects.

Donor support for assessment

The World Bank has supported various types of student assessments since 1975. A review of Bank support for “testing” 1975-1992 found 85 projects with testing subcomponents, most of which supported examinations and national assessments (Larach and Lockheed, 1992). The share of projects with testing components increased sharply between the late 1970s and the early 1990s, from fewer than 15% to over 40% of education projects. International large-scale assessments were not singled out in this review.

— Table 5.2 —

Recent World Bank projects mentioning international large-scale assessments

Name of project	Year project approved	Rationale for country's project	Project's development objective	Project may support country's participation in international large-scale assessment
Kyrgyzstan: Sector Support for Education Reform Project	2013	PISA 2006 and 2009 identified low achievement, geographical inequities	National assessment	No
Senegal: Quality and Equity of Basic Education	2013	PASEC identified low achievement	No	PIRLS, PISA, TIMSS
Peru: Basic Education Project	2012	No	No	PISA, TERCE
Moldova: Education Reform Project	2012	PISA 2009 + identified low performance	Participation in PISA 2015	PISA
Sri Lanka: Transforming the School Education System as the Foundation of a Knowledge Hub Project	2011	No	National assessment	PISA, TIMSS
Nicaragua: Second Support to the Education Sector Project	2011	SERCE identified low achievement and regional inequities	National assessment	TERCE
Lebanon: Second Education Development Project	2010	Yes	No	PISA, TIMSS
Jordan: Second Education Reform for the Knowledge Economy Project	2009	Yes	National assessment	PISA, TIMSS

Note: Financial resources from the project may be used for a country's participation in an international large-scale assessment; the country may or may not actually participate in any specific international large-scale assessment.

Source: World Bank (2015a), Projects database, <http://go.worldbank.org/KTPE1WKU20>.



A more recent review of 166 World Bank projects approved from 1998-2009 concluded that over 75% of projects supported some type of assessment (Lieberman and Clarke, 2012). Approximately one third of these projects supported one or more international large-scale assessment: 8 projects supported the Progress in International Reading Literacy Study (PIRLS), 19 projects supported PISA, and 21 projects supported TIMSS.

A search of the World Bank's electronic database of project documents, conducted for this report, found continuing support for assessments. A slightly higher percentage of the 18 education projects approved from 2010 to 2014 supported international large-scale assessments (38%), compared with projects approved from 1998-2009 (33%). Among these 18 education projects, 7 projects supported the country's participation in one or more international large-scale assessment (these are listed in Table 5.2). Only one project specifically indicated the level of support for PISA: approximately USD 2 million was allocated for Peru's participation in PISA 2015.

General policy dialogue with development partners

The World Bank has utilised the results of international large-scale assessments in its general policy dialogue with countries for over 35 years. In 1978, economists John Simmons, then at the World Bank, and Leigh Alexander published a literature review of the determinants of school achievement in developing countries that included the early studies of reading, science and mathematics carried out by the International Association for the Evaluation of Educational Achievement (IEA) (Simmons and Alexander, 1978). This research was cited in the first World Bank education sector policy paper of 1980 (World Bank, 1980).

Some years later, Simmons' review was expanded upon by Bruce Fuller (Fuller, 1987; Fuller and Clarke, 1994), then a sociologist at the World Bank, and the results were included in several World Bank policy documents in the early 1990s. These documents included: the Bank's contribution to the 1990 World Conference on Education For All (the Jomtien conference), the widely cited *Improving Primary Education in Developing Countries* (Lockheed and Verspoor, 1990), and the Bank's primary education policy paper of 1990 (World Bank, 1990).

World Bank education policy papers published over the past 20 years have continued to draw on the results from international large-scale assessments, including PISA. The 1995 *Priorities and Strategies for Education* cites the results of TIMSS and previous IEA studies and played a key role in increasing the focus on measuring and monitoring learning outcomes in countries (World Bank, 1995). The *Education Sector Strategy Paper* of 1999 encourages countries to: "1) establish standards for what students should know and be able to do at various stages of the education system; 2) participate in international evaluations of educational achievement; and 3) develop good national assessment systems." (World Bank, 1999). The World Bank Education Strategy 2020 (World Bank, 2011) emphasises the importance of measuring learning outcomes through national, regional and international assessments.

Identification of policy issues: Quality and equity

Results from some international large-scale assessments informed many of the World Bank's education projects of the 1990s, before the establishment of PISA and when achieving universal primary education was still a challenge for many of the Bank's client countries. The international large-scale assessment results provided some of the first empirical evidence for the relative effectiveness and efficiency of specific education investment (Lockheed and Hanushek, 1988). Results demonstrating the importance of learning materials and teacher preparation were influential in raising the number of World Bank projects supporting textbook development and teacher in-service training throughout the 1990s.

PISA and other international large-scale assessments have continued to be analysed to support the need for education system improvement in low- and middle-income countries. Table 5.2 summarises how PISA and other international large-scale assessments have been used in the project appraisal documents of recent World Bank projects to identify the need for financial support from the World Bank for the education sector in the country and to measure project outcomes, increasingly important with the rise of results-based-funding.

In addition to the World Bank; the Inter-American Development Bank, the Millennium Challenge Corporation and the Asia Development Bank have used PISA results to identify not only a country's overall performance relative to OECD averages, but also to locate between and within school inequities. For example, PISA results regarding low performance and/or sharp urban-rural differences in student learning were incorporated into rationales for projects supported by the Millennium Challenge Corporation in Georgia and the World Bank in Bulgaria,⁹ the Republic of Moldova and Kyrgyzstan.¹⁰ Other international large-scale assessments – principally the *Programme d'Analyse des Systèmes Educatif de CONFEMEN* (PASEC) and the Regional Comparative and Explanatory Study (ERCE) – have also been used for this purpose.



Project and programme results-monitoring and conditionality

World Bank projects and programmes, particularly in the early-to-mid 2000s, have utilised international large-scale assessments for both results-monitoring and conditionality. For example, Jordan's first Education Reform for the Knowledge Economy project (ERfKE I, 2003-2008) used TIMSS as an outcome measure, with the end target objective for the project "a positive statistically significant improvement in 2007 TIMSS scores." Although ERfKE II (2009-15) could have adopted PISA or TIMSS as an outcome indicator, a decision was made to use a national assessment tool instead. In one unusual case, Bulgaria's second Social Sectors Institutional Reform development policy loan from the World Bank required the successful completion of PISA 2006, PIRLS 2006 and TIMSS 2007 as a condition for the loan.

Overall, international large-scale assessments have contributed to the understanding of education policy issues in low- and middle-income countries for several decades. These assessments have informed dialogue about education quality and equity and have helped identify promising pathways for education reform. Results for specific countries have helped shaped investment priorities.

IMPACT OF INTERNATIONAL ASSESSMENTS ON POLICY AGENDAS AND REFORMS

The impact of an international assessment such as PISA on education policy agendas and reforms in any country can be direct or indirect. Direct effects could come from discussions among stakeholders at the country level, whereas indirect effects could come from general discussions in broader policy forums, conferences or the media. International large-scale assessments could affect agenda setting, policy formulation, policy implementation, or monitoring and evaluation. Impacts could also include the confirmation or rejection of existing education policies or policy directions. Perhaps the most important impact is the identification of education issues.

PISA and other international large-scale assessments have often drawn attention to three pressing issues in education: *i*) the poor quality of student learning; *ii*) inequality in student learning; and *iii*) inequality in the distribution of learning resources across schools and geographical areas (OECD, 2013a, 2013b). Interviews carried out for this report confirmed that PISA draws attention to these issues. In Turkey, for example, one interviewee noted that "Turkey engaged with PISA as a key component and source of evidence for the preparation of the Education Sector Study programme in 2004-05", and that "the government agreed to join PISA, work with national and international experts to analyse PISA results to learn about education quality and equity in Turkey, and publicise the results broadly to citizens to raise education quality as a key issue." In Colombia, one interviewee mentioned that the World Bank had "a very deep discussion" with the minister of education about the results of PISA and the minister was interested in learning more about "some international experiences [from] Poland, Finland, Canada and Brazil."

Methodological caveat

Empirically linking PISA with policy reforms in middle-income countries is a difficult task for four methodological reasons. First, the PISA cycles occur frequently and concurrently with many other events that could contribute to reforms, including changes in government, so that empirical attribution of reforms to PISA, specifically, is virtually impossible. Second, as the previous sections have demonstrated, the public discussions of PISA results are not always visible enough to stimulate reforms in these countries and do not appear linked to the PISA cycle. Third, most empirical studies have examined only the perceived, rather than the actual, effects of PISA on education policy and therefore shed only a weak light on PISA effects. Finally, even the surveys of perceptions about PISA have focused mainly on OECD and high-income countries, with middle-income countries less well represented. Some of these caveats also apply to research on the policy effects of other international large-scale assessments.

Research on international large-scale assessments and education policy

Research on education policies can be divided into two main groups: research related to the stages of policy formation and implementation, and research related to specific education policies. PISA and other international large-scale assessments often contribute to one important stage in policy formation – agenda setting – through documenting issues of education quality and equity. Analyses of the results from international large-scale assessments also often suggest areas where policy reforms could improve these outcomes. Some research suggests that international large-scale assessments influence both policy agenda setting and policy implementation.

International large-scale assessment may affect policy agenda setting

Two studies that examine the impact of international large-scale assessments on education policy agenda setting reach different conclusions. The first, a systematic review of the literature from 1990-2011, identified 19 studies that addressed the impact of international assessments on implemented education policies in low- and middle-income countries;



of these, 11 were considered “high quality” studies, and three of the “high quality” studies referenced PISA, specifically (Best et al., 2013a). Best’s review grouped the effects of PISA with those of other international large-scale assessments (TIMSS, PIRLS, International Assessment of Education Progress [IAEP], IEA Civic Education Study (CIVED), International Computer Competence Study [ICCS], Monitoring Learning Achievements [MLA]) to draw conclusions regarding assessment effects on four policy processes: agenda setting, policy formulation, policy implementation, and monitoring and evaluation. The review found that international large-scale assessments were mainly associated with policy implementation and monitoring and evaluation, and less with agenda setting or policy formation.

The second study, a recent survey of 6 744 “opinion leaders”¹¹ in 126 low- and middle-income countries and jurisdictions,¹² examined the policy-making influence of external assessments across multiple sectors, including education. The study concluded that external assessments, including PISA, were more influential on agenda setting than on specific policy design.¹³ Actual education reforms were perceived as only weakly influenced by external partners, including the OECD (Parks et al., 2015).¹⁴

International large-scale assessments may suggest specific education policies

International large-scale assessments are perceived to influence a variety of specific education policies that are designed to improve education quality and equity in middle-income countries.

Recent reviews by the OECD (OECD, 2013b) and others (Glewwe et al., 2014; Kremer, Brannen and Glennerster, 2013; Krishnaratne et al., 2013; McEwan, 2014; Murnane and Ganimian, 2014), suggest five broad areas where changes in education policy could result in higher student learning outcomes in low- and middle-income countries: *i*) selecting and grouping students; *ii*) non-personnel resources invested in education; *iii*) resources invested in the quality of instructional staff; *iv*) school governance and assessments; and *v*) curriculum and instruction.

Within each of these categories are numerous specific policy areas, for example:

1. Selecting and grouping students: class size (Heyneman, 2003; Lockheed and Hanushek, 1988) or grade retention (Manacorda, 2012; OECD, 2013a; Schwerdt and West, 2012).
2. Resources invested in education: instructional materials and technology (Baker, Goesling and LeTendre, 2002; Lockheed and Hanushek, 1988; Lockheed and Verspoor, 1990; OECD, 2013b).
3. Resources invested in the quality of instructional staff, particularly in-service professional development (Abdul-Hamid, Abu-Lebdeh and Patrinos, 2011; Best et al., 2013; Glewwe et al., 2014; Hanushek, Link and Wößmann, 2013; Wagemaker, 2014).
4. School governance, accountability, assessment and standards (Best et al., 2013; Galiani and Perez-Truglia, 2014; Hanushek and Wößmann, 2014).
5. Curriculum and instruction, including pedagogy, teaching and opportunity to learn (Best et al., 2013; Heyneman and Lee, 2014; Schmidt, Zoido and Cogan, 2014; Wagemaker, 2014).

Research on PISA and education policy

Several studies have examined PISA’s effect on education policy, but most have reported results largely from high-income countries. A recent review of education policy in Latin America provides extensive descriptions of policy changes, but makes little connection with PISA (Rivas, 2015). Studies of PISA effects on education policy include:

1. A very comprehensive OECD survey of PISA stakeholders examined the policy effects of PISA 2000, 2003 and 2006. It achieved a very high response rate from the surveyed high-income countries (86%, 31 out of 36 countries), but a much lower response rate from the surveyed middle-income countries (57%, 12 out of 21 countries) (OECD, 2008).
2. Only 5 of the 37 PISA Governing Board members who responded to a 2011 survey of all members represented middle-income countries (Breakspear, 2012).
3. A recent study of PISA’s effect on education policy included no middle-income countries, but focused on four European Union (EU) countries participating in PISA 2006 and PIRLS 2006 (Dixon et al., 2013).
4. An OECD study summarised policies and practices from eight high-income economies and two upper-middle-income countries that could be applicable for the United States (OECD, 2011).
5. An Education International (EI) study surveyed EI representatives from 26 countries, of which 23 were high-income countries (Figazzolo, 2009).

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6. A narrative review provided examples of the effects of assessments in 21 countries, including 5 middle-income countries. PISA was mentioned as a driver of change in Mexico (Heyneman and Lee, 2014).
7. A study of the policy effects of PISA focused on six high-income countries and economies (Baird et al., 2011).
8. A study of the “soft policy” effects of PISA focused on Switzerland and the United States (Bieber and Martens, 2011).

The absence of data from most middle-income countries means that the conclusions reached from many prior studies of the effects of PISA on education policy may be less applicable to middle-income countries than to the high-income OECD countries for which the studies were intended.

Differences between middle-income countries and high-income countries

The perceptions of stakeholders from middle-income countries regarding the effects of PISA on education policy differ from the perceptions of stakeholders from high-income OECD countries. An OECD survey of stakeholders from countries participating in the first three PISA cycles reported that PISA positively affected education policy with respect to: development of national standards, establishment of national institutes of evaluation, changes in the curriculum, introduction of targeted educational programmes, increased allocation of resources to schools and increased collaboration among key stakeholders (OECD, 2008). However, among the 12 middle-income countries that responded to this survey, 7 reported that PISA had “relatively low levels of impact on policy formation”, 2 reported “relatively medium levels of impact” and only 3 (Kyrgyzstan, Mexico and Thailand) reported “relatively high levels of impact” (OECD, 2008).

Similar differences were found in a survey conducted in 2013 (Breakspear, 2012). Nearly 60% of the 32 high-income countries/economies covered reported that PISA had been “extremely” or “very” influential in informing the policy-making process. However, middle-income countries were somewhat less positive, and the small number of respondents meant that these differences could not be tested. Among the five middle-income countries, none reported that PISA had been “extremely” influential and only Hungary and Mexico reported that PISA had been “very” influential in informing the policy-making process (40% of the middle-income respondents). By comparison, Chile reported that PISA was “moderately” influential and Indonesia and Turkey reported it was “not very” influential, although respondents noted that PISA was used for PISA-referenced performance targets and indicators in both countries.

Moreover, reforms suggested by analyses of PISA in OECD countries – such as increasing school autonomy – appear to be correlated with quality improvements in high-income countries, but not in low- or middle-income countries (Hanushek et al., 2013). As a recent World Bank analysis of data from Bulgaria observes: “the effects of Bulgaria’s 2007 school autonomy reform on student achievement are mixed and worse than expected” (World Bank, 2012). Similar conclusions were drawn about the effects of Kyrgyzstan’s teacher incentive reform on enhancing teacher motivation (Lockheed, 2014).

Effects of PISA on education policy in middle-income countries

Studies focused on specific middle-income countries, as well as interviews conducted for this report, indicate that the effects of PISA typically relate to revising curriculum standards, establishing performance targets related to PISA, and – in some cases – specific education reform policies intended to boost performance.

For example, Jordan responded to both TIMSS and PISA results to compare itself with the world’s best achievers, review its curriculum, establish performance benchmarks and revise teacher training (Abdul-Hamid et al., 2011). In Kyrgyzstan, PISA results affected reforms such as the development of new standards and curricula, reductions in teaching load, upgrading of physical facilities, teaching practices and per-capita financing; although some of these reforms pre-dated PISA (Shamatov, 2014; Shamatov and Sainazarov, 2010).

In addition, middle-income countries have reflected on the types of skills assessed by PISA and how these skills could be better included in the national curriculum and standards. Interviewees from middle-income countries participating in PISA 2015 generally agreed that the results of PISA have informed curriculum improvement and teacher training programmes. In Indonesia, one interviewee noted that the 2013 curriculum “came out of nowhere” but that a “big motivation for the reform was that Indonesia did not do well on PISA”; a new curriculum was developed to respond to “PISA-like things.” In Kazakhstan, one interviewee noted that PISA had been used with respect to “the National Action Plan on Development of Functional Literacy of School Students for 2012-2016 [which] was adopted on the instruction of the President [in his] annual Address to the Nation.” In Mexico, the president’s education sector programme established performance targets for 2012 based on PISA (OECD, 2010). Subsequently, Breakspear (2012: 26-27) reports that for Mexico “The Agreement for the Articulation of Basic Education asserts that the whole curriculum should set a vision for 2021 that includes generalising the competencies described in PISA Level 3.” In Turkey, Breakspear notes that: “national performance targets are determined according to the country’s score on PISA and the OECD average.”



The experience of PISA has influenced the design of national assessments. Interviewees from middle-income countries participating in PISA 2015 noted that PISA had informed other assessment activities in their country, such as national assessments. For example, in Indonesia the national assessment was being revised to include new PISA-type items. In Moldova, one interviewee observed that PISA results influenced a change in the methodology of the national examination toward greater standardisation. The movement towards the greater use of performance assessment was also noted.

CONCLUSIONS AND IMPLICATIONS FOR PISA IN MIDDLE-INCOME COUNTRIES

Conclusions

This chapter has explored how PISA could affect education policy in middle-income countries. The evidence indicates that high-income OECD member countries have responded to the publication of PISA results by seeking to learn from the experience of other countries and by reflecting on education policy, often very publicly. The evidence for middle-income countries is more limited, but suggests that this is less the case.

Public dialogue about education policy, as observed in selected public media from eight middle-income countries, shows little relationship with the publication of PISA results. However, PISA and other international large-scale assessments have informed the private policy dialogue between countries and development partners, as indicated by a review of World Bank projects. International large-scale assessments have provided empirical evidence of the need for policy reforms to improve the quality and equity of education outcomes in numerous countries, and have occasionally been used as key results indicators for projects and programmes supported by donors. This chapter reaches six conclusions:

1. Media coverage of education and education policy does not rise and fall systematically with the publication of PISA results, suggesting that the media may not play as strong a role in education policy agenda setting in middle-income countries as it does in high-income countries and economies.
2. PISA provides evidence of education quality and equity in middle-income countries, and countries have used this evidence in education policy dialogue with development partners.
3. Recommendations for policy reforms, derived largely from analysis of PISA results from high-income countries, may not apply to middle-income countries.
4. PISA's perceived influence on education policy is more positive in high-income countries or economies than in middle-income countries.
5. There is conflicting evidence with respect to the impact of PISA on education policy agenda setting in low- and middle-income countries.
6. Some evidence indicates that the principal education policy reforms influenced by PISA involve curriculum alignment with international standards, teacher training aligned with the curriculum, and improvements in the overall student assessment systems.

Implications

Two main implications to increase the influence of PISA on education policy in middle-income countries can be drawn from these findings.

For middle-income countries

To increase public discussion of PISA results and education policy, in general:

1. Countries could consider expanding media coverage for disseminating the results of PISA beyond conventional press releases that appear to be short-lived in middle-income countries. Approaches could include: using social media to communicate results in local languages and hosting seminars to disseminate information to ministry staff, local NGOs, and local donors.
2. Countries could also expand their outreach to all stakeholders in the education system, including parents, teachers and schools.

For the OECD

To improve the relevance of PISA results for middle-income countries:

1. The OECD could consider revising some of its regular analyses of PISA to focus on middle-income country participants, rather than grouping all non-OECD partner countries/economies into a single group. Instead it could analyse results separately by income group and region.

Notes

1. The OECD defines policy as any course of action undertaken by a government.
2. The term “21st century skills” refers to a broad set of knowledge, skills, work habits and character traits that are believed – by educators, school reformers, college professors, employers and others to be critically important to success in today’s world, particularly in collegiate programmes and contemporary careers and workplaces.
3. Google Scholar search on 17 September, 2015 for articles and book chapters containing the words “Programme for International Student Assessment”, “developing country” and “education policy”.
4. The full report is available from the OECD.
5. These countries participated in PISA in the following cycles: Georgia 2009; Indonesia 2000-12; Viet Nam 2012; Kyrgyzstan 2006, 2009; Bulgaria 2000, 2006-12; Brazil 2000-12; Colombia 2006-12; Jordan 2009-12; Turkey 2003-12.
6. Complete information on the research methodology is provided in Shadrova (2015).
7. The publications with the largest daily (unless otherwise noted) circulation were: Brazil (Veha: 1.2 million weekly), Bulgaria (Dneven Trud: 70 000) Colombia (El Tiempo: 1.3 million daily), Georgia (civil.ge: 10 000 visitors), Indonesia (Kompas: 5 million), Jordan (Al Rai: 80 000), Kyrgyzstan (Vecherniy Bishkek: 50 000).
8. In Brazil, $p = 0.03$ for peaks of 2002, 2007, 2011, 2014; in Indonesia $p = 0.025$ for peaks of 2004, 2009, 2014.
9. Bulgaria DPL I (2007) supported four testing activities, including “managing Bulgaria’s participation in international achievement tests such as TIMSS, PISA and PIRLS” (World Bank PAD). The implementation completion report (ICR) for this loan noted that: “In 2006, Bulgaria participated in PISA and PIRLS, and in TIMSS in 2007. PISA results suggest a large variance in student achievement between schools, as opposed to within schools, suggesting that there are many high quality but also many failing schools often in socially excluded Roma localities.”
10. Kyrgyzstan (P113350) project appraisal document noted that: “The country’s participation in the OECD’s Programme for International Student Assessment (PISA) showed that, while Kyrgyz student’s performance improved between 2006 and 2009, 15-year-olds lag an approximate four and a half grade levels behind the OECD average.”
11. Only 5% of the respondents (377) self-identified as working in the education sector, and only 15 respondents rated PISA’s influence.
12. The survey included respondents from internationally unrecognised jurisdictions, such as “Kurdistan” and “Puntland” and therefore the term “country” is not used.
13. PISA was singled out in this report as the assessment having the greatest influence on education policy agenda setting, but no other international large-scale assessment was included in the list of 103 external assessments presented to the respondents, for comparison. Among the surveyed countries, eighteen were participating in PISA 2015. Respondents were asked to identify the most influential assessment specific to their sector, in terms of agenda setting and reform design. Although approximately 5% of the respondents were education experts, not all were asked all questions; 17 respondents – half from the European and Central Asia region – rated PISA positively for its effect on agenda setting for education and 15 indicated that PISA had a positive effect on reform design.
14. Only 15 respondents rated PISA’s influence, and no other international large-scale assessment was included in the list of potential influencers. The only other listed development partners in education were: the UNESCO Global Monitoring Report, the World Bank’s Education Sector Review, the World Bank’s EdStats and the Paris Declaration indicators. The exclusion of the other major international large-scale assessments (TIMSS, PIRLS, SACMEQ, TERCE) from the list raises questions about the comprehensive nature of this study, with respect to education.

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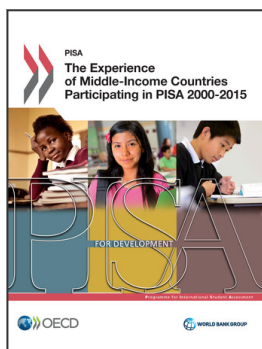
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From:
**The Experience of Middle-Income Countries
Participating in PISA 2000-2015**

Access the complete publication at:
<https://doi.org/10.1787/9789264246195-en>

Please cite this chapter as:

Lockheed, Marlaine, Tijana Prokic-Bruer and Anna Shadrova (2015), "How have PISA results informed education policy discussions and affected policy in middle-income countries?", in *The Experience of Middle-Income Countries Participating in PISA 2000-2015*, The World Bank, Washington, D.C./OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264246195-8-en>

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