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How can PISA for Schools be of use to South Africa?

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Introduction and background

On 5 November 2020, JET Education Services (JET) and the Organisation for Economic Co-operation and Development (OECD) co-hosted a seminar to explore the potential which the PISA for Schools project (OECD, 2020a) may hold for South Africa. The Programme for International Student Assessment (PISA), a programme of the OECD, is an internationally-benchmarked assessment which measures 15-year-olds' ability to use their reading, mathematics and science knowledge and skills to meet real-life challenges. While PISA allows countries to measure the performance of a representative sample of schools against objective benchmarks and against those of other participating countries, PISA for Schools (PFS) enables individual schools to assess the strengths and weaknesses of their students in these subjects.

In addition to OECD and JET Education Services representatives, participants in the seminar included voices from the Department of Basic Education (DBE), academics working in assessment, teacher unions, nongovernmental organisations and funders invested in the improvement of South African education.

The seminar raised interest in the assessment but also important points of consideration regarding PFS. Details related to the logistics of the test can be reviewed in this response to questions raised in the seminar, and the full PFS seminar can be viewed by clicking here, or upon request.

This document is the product of further engagements with stakeholders and a review of work to date in the area of South African assessment. It engages with the current assessment policy and practice in South Africa, future directions for assessment in South Africa and PFS resources to respond to the broader question raised at the seminar, namely: Will PFS add unique value in the South African assessment space?



The assessment landscape in South Africa

school sector contains some areas of stability and others undergoing development. The roots of the National Senior Certificate (NSC), the most stable part of the assessment system and producing a qualification which caps the end of 12 years of schooling, are to be found in the Joint Matriculation Board which predates the country's democratic era by several decades. The NSC primarily serves a certification function which has wide currency in further and higher education and the labour market. The NSC also provides a strong accountability mechanism for schools, provinces

PISA FOR SCHOOLS

The international bench marking assessment for the improvement of student learning and well-being.



and the nation, with the annual results precipitating a furious debate about the state of schooling in the country, individual provinces and individual schools. Third, the NSC serves a formative function, giving rise to a sizable market for past papers, avidly snapped up by teachers and students in preparing for the annual round of examinations.

International comparative tests provide another stable part of the assessment system, with South Africa participating in several iterations of the Progress in International Reading Literacy Study (PIRLS), the Trends in International Mathematics and Science Study (TIMSS) and the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) assessments during the last two decades. These serve a systemic function, and all point to a significant rise in scores at the national level over this time, indicating a steady improvement in systemic quality (or at least a growing familiarity with the test format and question types) in reading, mathematics and science at primary and secondary levels.

Regarding internal measures of the school system, 10 of the 27 goals in the DBE's *Action Plan to 2024* (DBE, 2014) are phrased in terms of improved test scores in language and mathematics at Grade 3, 6, 9 and 12 levels. However, progress towards measuring these outcomes remains a work in progress. The Annual National Assessments (ANA) were piloted in 2011, and the following year, the programme was expanded to test all learners in language and mathematics in Grades 1 to 6 and 9. The latter process was repeated annually until 2014 and was terminated in 2015, largely due to union opposition.

Criticism of the ANA was directed from a number of different perspectives, including the fact that the tests were not comparable from one year to the next, that the results were not reliable since they were administered and marked by teachers and that, in attempting to serve both summative and formative purposes, they served neither adequately; many of these criticisms were validated by the discrepancies between the results from a sample of schools in which the tests were administered and scored by an agent external to the schools (NEEDU, 2017). The latter point was summarised as follows in an evaluation conducted by the World Bank in 2013:

Among high-level stakeholders within the DBE, the main value of the ANA is as a key component of an accountability framework. ...In contrast, at both provincial and school levels, stakeholders would prefer a more diagnostic role¹, where the ANA results directly inform educational policy and classroom practice. (World Bank, 2013: 4).

1 Of course, the difference between summative and formative assessments lies largely in the way in which the results are used.

We pick up this issue below, where we identify formative assessment as a pressing need at school and classroom levels. But first, we briefly describe the current plans of the DBE in the assessment terrain. The new National Framework for Assessment is intended to serve three purposes (Chetty, 2020):

- To improve learning by providing feedback to teachers and learners on whether learning is taking place and identifying areas of weakness (Diagnostic);
- To make a judgment about a learner's level of performance against defined learning outcomes (Summative);
- To monitor the performance of the education system and to identify trends against social justice principles (Systemic).

More detail is provided in Table 1.

If these plans are brought to fruition, government will have addressed a number of the criticisms directed towards the ANA and, in particular, the separation of systemic and diagnostic purposes. However, according to Chetty (2020), there are three challenges to achieving the goals described in Table 1:

- A packed assessment space, with three studies targeting Grade 9: TIMSS, SE and GEC;
- Teacher unions arguing against overwhelming the system with yet more performance data which is little used formatively;
- Limited funding due to government reprioritisation.

Under the financial circumstances, it is likely that the projects listed above will require a degree of prioritisation, while COVID-19 has almost certainly slowed down the timeframes envisaged.

Purpose Detail Timeframe Progress to date Systemic • Evaluates the health of the First round • DBE working with Australian Council for assessment system targeted in Educational Research and HSRC to develop tests 2019 (SE) Administered in Grades 3, 6 First cycle of SE in Grades 3, 6 and 9 to be finalised and 9 by June 2020 Once every three years, sample based Summative • All learners in the grade write 2021 Pilot • Qualification Framework (QF) reviewed for General assessment an examination/standardised 2022 First Education Certificate (GEC) (Grade 9) round assessment Approval to hand QF to Umalusi for refinement. Will form part of the end of Qualification submitted to Umalusi for finalisation the year exam and submission to the South African Qualification • Focus on Grade 6 and Grade 9 Authority (SAQA) for registration on the National Qualification Framework (NQF) Diagnostic/ Used by teachers to identify First round of Test being developed by Innovation Edge Formative ELNA in 2020 learning gaps, starting with • Pilot done at Early Childhood Development (ECD) assessment school readiness at Grade R/1 level in 2019 (ELNA) Gives a broad assessment as to whether learner is AfL • 'at risk' or not Administered and integrated ٠ into teaching and learning

Table 1: The National Assessment Framework (DBE, 2017; Motshekga, 2019; Poliah, 2019)



What are South Africa's most urgent assessment needs?

The country is relatively well served on the systemic evaluation (SE) front (TIMSS, PIRLS, SACMEQ) and immediate implementation of DBE plans for SE in this area may not be the most urgent priority. One priority which stands out in Table 1 is the General Education Certificate (GEC) which is scheduled to cap the period of compulsory school at the end of Grade 9. This will introduce an important quality assurance mechanism before learners embark on the Further Education and Training (FET) level. However, the system will be expensive and, given present circumstances, may be delayed. In addition, as mentioned above, this level of the system is already very busy, and if PFS is to enter South Africa, a trenchant argument will need to be made.

Although learner participation at Grade R level is significantly above 90%, an evaluation commissioned by the Department of Planning, Monitoring and Evaluation (DPME) in 2013 found that only children from the wealthiest quintile benefitted from this experience (van der Berg et al, 2013). Clearly, there is a serious problem regarding the quality of teaching in this area. The Early Learning National Assessment (ELNA) initiative, essentially a school-readiness test, will be a very important tool in identifying common problems and directing teachers towards more effective pedagogical strategies at the critically important Grade R/1 interface. This project must constitute a top priority.

Regarding the everyday use of formative assessment to guide practices at all levels of schooling, the DBE has amended the assessment component of the Curriculum and Assessment Policy Statements (CAPS) which, inter alia, now includes a substantial section on assessment for learning (AfL) (see, for example, DBE, 2019). While these amendments have reduced what was considered to be a heavy assessment load on teachers, the problem regarding AfL remains: teachers are unable to effectively exercise formative assessment as an integral part of everyday pedagogical practice. Developing this capacity must also rank as a top priority for the country.

Interventions in the field of AfL

In an attempt to address the capacity needs of educators with respect to AfL, several interventions have been initiated in the recent past. One of the earliest of these, the Teacher Assessment Resources for Monitoring and Improving Instruction (TARMII) tool, occurred under the joint auspices of the DBE and the Human Sciences Research Council. TARMII was designed to support teachers to carry out classroom assessment to determine what learners know and can do, and to utilise the learner performance information to design corrective measures (Makgamatha et al, 2010). One of the disadvantages of TARMII is that teachers require not only suitable hardware and the appropriate software, but also the ICT skills required to access and utilise the tool. Since these resources are not in abundant supply in South African schools, it is likely that, where TARMII is used, it will predominantly be in schools serving relatively privileged communities.

Another early intervention was the Data Informed Practice Improvement Project (DIPIP) (Shalem & Brodie, 2007; DIPIP, 2008). This was a collaboration between the Gauteng Department of Education and Wits University. The goal of DIPIP was to create a context for professional conversations in which mathematics teachers, together with university academics, graduate students and government-based subject advisors, discussed how learners' misconceptions could be used to promote collaborative lesson planning, teaching and reflection. An evaluation found that the learning in the professional learning communities in which teachers met over the period of three years was noticeable but slow and that the presence of expert group leaders was necessary, particularly in the Foundation Phase (Grades 1-3) groups (SAIDI, 2013). Subsequent investigations confirm that large numbers of teachers continue to battle to use assessment data to inform their teaching, in the face of the existence of abundant comparative data on learner performance produced by, among others, PIRLS, SACMEQ and TIMSS. This was the finding of Kanjee and Moloi (2014) in their study of how teachers used ANA results to improve learning. A majority of teachers said that they received little support in this regard, and that no plans were in place at their schools for the use of ANA data. A significant proportion also indicated that they received little or no support from the school district on how to use ANA results. These findings were consistent across the school quintiles as well as the Foundation and Intermediate Phases.

Taking this work further, Kanjee (2020:3) explored teachers' pedagogical practices in relation to five key formative assessment strategies: *introduction of lesson objectives and assessment criteria, questioning and learner engagement, feedback practices and peer and self-assessment*. This study was conducted in two districts involving 96 Foundation and Intermediate Phase teachers selected from 54 fee- and no-fee-paying schools. Although all five strategies were observed in the pedagogical practices of teachers sampled, only a minority of teachers were able to demonstrate effective use of any specific strategy. No significant differences were detected between teachers in fee-paying and no-fee-paying schools or between teachers in the Foundation and Intermediate Phases.

Of most concern was the finding that descriptive feedback (i.e. dealing with the *subject content* of the knowledge displayed) provided by teachers to their learners was extremely rare. Where feedback was given to learners, its was predominantly of an evaluative or procedural nature, both of which do little to advance learning. According to Kanjee, descriptive feedback provides learners with appropriate details on what to do next and can also support learners to take responsibility for their own learning. In this regard, he found that lower-performing learners were provided with more procedural and negative comments and fewer positive comments compared to higher-performing learners, in inverse proportion to their needs.

This brief and selective review of teacher development exercises in the field of AfL confirms two prominent features:

- At the policy level, both national and provincial, there is an awareness of the importance of AfL and of the need to bring it into schools and classrooms.
- At the school and classroom levels, there is a paucity of capacity to effect AfL and a strong need to develop educator skills in this regard.

Can PFS assist schools to implement AfL?

The project measures 15-year-old students' abilities to think critically, solve problems and communicate effectively in the content areas of reading, mathematics and science (OECD, 2020b). However, PISA's test and question design differs from most standardised assessments in that the items assess not only students' understanding of the knowledge and skills embodied in content topics, but also students' ability to apply that knowledge (See Textbox 1).

In addition, PISA for Schools (PFS) provides information on learners' socio-economic contexts, teacher-student relations, disciplinary climate in school and students' attitudes, engagement towards learning and social and emotional skills. Results are benchmarked against international PISA scores

Textbox 1: PISA measures students' ability to apply content knowledge to specific problems

Rather than provide a series of disconnected questions, PISA and PFS cluster them into units that revolve around a complex theme and build upon one another. For instance, PISA 2015 science questions included an extended scenario called "Running in Hot Weather," in which students are asked to assimilate information about dehydration, populate an interactive chart with air humidity and body temperature data, and form conclusions about the health risks posed to an individual running on a hot day without water.

OECD places students' scores into six levels of proficiency, with level 6 representing the highest level. The OECD explains it this way: At proficiency level 6, students can consistently identify, explain and apply scientific knowledge and knowledge about science in a variety of complex life situations. They can link different information sources and explanations and use evidence from those sources to justify decisions. They clearly and consistently demonstrate advanced scientific thinking and reasoning, and they demonstrate willingness to use their scientific understanding in support of solutions to unfamiliar scientific and technological situations. Students at this level can use scientific knowledge and develop arguments in support of recommendations and decisions that centre on personal, social or global situations.

Source: Institute for Education (IEP), 2017.

and against scores of PFS participants operating in similar socio-economic contexts. A 30-minute student survey is designed to illuminate personal and affective aspects of students' lives such as the number of family members who live with the student, the educational attainment of each parent and the educational atmosphere of the home. Critically, the survey also probes the students' relationship with the PISA subject of emphasis (reading, maths or science) and with their teachers.

School leaders receive an integrated, information-rich report that enables them to consider academic outcomes in the context of student-teacher relationships, student motivation and student self-efficacy and to compare their students' performance to peers around the world. The report also indicates whether students are performing better or worse than expected, given their socioeconomic standing.

The comprehensive data set enables schools to understand the strengths and weaknesses of their learners and, by inference, of their teachers. It also enables schools to understand the home backgrounds and attitudes of learners and thus be better able to devise support programmes in both the academic and social terrains.

Participation by schools is voluntary, and test results are released only to the school. While the school may use the results for self-accountability purposes, the intention is primarily formative. Building capacity for educational improvement is therefore one of the main aims of PFS. Towards this end, a number of activities are made available to participating schools aimed at building educator capacity and supporting them to implement evidence-based improvement measures at their schools.

These activities include an Online Community Platform dedicated to PFS participants and a network of international ambassadors providing support for carrying out improvement plans. A post-testing workshop contains activities designed to increase data literacy of school principals and teachers, to create opportunities to promote peer-learning (by, for example, selecting relevant case studies out of all participating schools) and to present compendia of OECD findings on particularly relevant topics.

Given the rich information provided to each school following the annual round of testing and the high-quality

support services offered, it is no small wonder that several school districts around the world have taken to using PFS to improve teaching and learning across the high schools falling under their respective jurisdictions (Textbox 3).

From a South African perspective, one of the most promising of the PFS support activities is the Item Analysis and Item Development (IAID) initiative (OECD, 2020c). IAID is currently under construction but its plans indicate that it is aimed at developing the knowledge and skills required to implement AfL. Details are provided in Textbox 3.

Textbox 2: How the PFS is used in the Gwinnett County Public School system

The Gwinnett County Public Schools (GCPS) is the largest school district in Georgia, USA. Its 21 high schools serve more than 55,000 students, 69 percent of whom are students of colour and 48 percent of whom qualify for free or reduced-price lunch. The district's reasons for signing up for the OECD Test for Schools were four-fold: • understand, as a school community, what world-class performance looks like; • familiarise teachers with international benchmarks that other countries are using; • encourage the habit of not only understanding, but also applying, academic concepts to real-world scenarios; and • leverage information gleaned from the OECD Test for Schools report to improve teaching and learning across the district.

Individual school reports are not made public. Rather, district leaders carry the information gleaned from the reports into conversations with principals, curriculum leaders and teachers. GCPS hired an experienced former principal to serve as the fulltime PFS facilitator. Inter alia, the facilitator holds professional development sessions throughout the year on integrating PISA-style questions into daily lessons.

Source: IEP, 2017.

PFS provides information on learners' socio-economic contexts, teacher-student relations, disciplinary climate in school and students' attitudes, engagement towards learning and social and emotional skills

Textbox 3: Outline of the Item Analysis and Item Development Project

Aim of IAID

The overall aim of IAID is to build national capacity, which in turn will be conveyed to participating schools. Furthermore, this project will introduce a sustainable cycle of item renewal, analysis and refinement in the development and use of assessment instruments.

The project has been designed by the PFS team in response to strong demand to gain a better understanding of how assessment can inform teaching practice in the classroom. It will be offered as a complement to the administration of the PFS in schools around the world, on a voluntary basis.

Project components

Two components are mutually reinforcing, complementary and undertaken in parallel:

- 1. Item development: Participants will author item units for each PISA main domain.
- 2. Item analysis: Participants will undertake item analysis of the PISA results.

Why does item analysis and development matter?

A deeper understanding of student response behaviour provides a powerful opportunity both to find out what students don't understand, but also to find out what teachers don't understand about students. Investigating response patterns in finer detail may reveal faulty premises in either item authoring or in teaching practices or both. Such analysis also provides ways of inferring students' strategies, which will give participants a clearer view of what they should do after the assessment.

Crafting new cognitive items using the PISA frameworks provides teachers with hands-on experience of how to develop appropriate measures of students' information-processing and problem-solving skills. Taking part in the ongoing development of new PISA-based items builds both capacity to craft competence-based items and expands the possibility of obtaining useful information on students' proficiency levels.

Project activities

The project will be highly interactive and consist of both synchronous (e.g. webinars) and asynchronous (e.g. independent item drafting and review) activities, conducted mainly online. Participants will benefit from regular contact with OECD experts, invited experts and structured peer-learning through a series of presentations and joint technical review meetings.

Conclusion

The criticism that the South African school system is overtested and the results under-utilised was repeated by participants in the OECD/JET seminar on 5 November. These concerns were raised by teacher unions and academics, and introducing PFS to South Africa should only be considered if it is able to offer assistance in finding a resolution to this problem. And in the interests of optimising the use of resources in this regard, a further question must be asked: is PFS better equipped to undertake this task than any of the initiatives developed within the country?

According to Richard Elmore, a school's response to external accountability measures is only as good as the strength of its internal quality assurance and data management systems (Elmore, 2004), the strengthening of which, in turn, requires an investment in capacity building (Elmore, 2008). And there is increasing agreement that such capacity building is best done in the workplace, with teachers and curriculum leaders interacting continuously with each other around academic work. The description of PFS given above indicates that it is precisely this kind of activity that the project sets out to bring to schools. Furthermore, it has in place a set of activities, instruments and communication networks to support this work. Once the IAID project is in place, the support systems offered by PFS will be further strengthened.

The purpose of PFS is not to compete with local initiatives in the field of AfL, but to learn from them and to complement their activities. In addition, PFS brings a fit for purpose infrastructure and support systems for offering a high quality AfL system to interested schools, which currently no local project is able to offer.

Recommendations

It is recommended that PFS be piloted in South Africa under the following conditions:

- The primary purpose of the project will be capacity building for AfL among teachers and curriculum leaders at school- and systems-level.
- Schools able to pay for their own participation will be free to do so.
- Funds will be sought to facilitate the participation of schools serving poor communities. This is a key condition, on which the existence of the project will depend.
- One option for raising funds is to link participation in the project with donor-funded school improvement programmes at secondary level.
- The project must maintain a dialogue with the assessment community in South Africa in order to share the lessons of PFS and to learn the lessons derived from other interventions.



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