

## INCLUSIVE ECONOMIC DEVELOPMENT (IED)



In delivering 'social science that makes a difference', the Research Programmes of the Human Sciences Research Council initiate and undertake policy-oriented research projects and programmes from its offices in Cape Town, Durban, Pietermaritzburg and Pretoria. Its public-purpose mandate is set out in the Human Sciences Research Council Act of 2008.

The Inclusive Economic Development (IED) division of the Human Sciences Research Council undertakes research that aims to transform educational outcomes and increase economic participation. It recognises that education and the economy have long been linked, and thus conducts research in both areas, sometimes discreetly, often overlapping, and through a multidisciplinary lens. The division works in two themes: *Education and Livelihoods* that aims at improving educational outcomes, and *Changing Economies*, that investigates the social, spatial and structural obstacles to economic participation to bring about the gains and growth that South Africa and the rest of the continent needs. In *Changing Economies* we attempt to understand the social dynamics of economies with a focus on how more communities might benefit from people-centred innovation and spatial planning that allows greater inclusion. An important focus here is the strengthening of social trust, and the eradication of exclusionary practices at the level of households and in macroeconomic policy choices.

**The Trends in International Mathematics and Science Study (TIMSS), within the IED Division is looking for TWO (2) experienced consultants (one for science and another for mathematics) to analyse the data relating to learner performance. Please see below for details.**

### Background

The Trends in International Mathematics and Science Study (TIMSS) is an assessment of the mathematics and science knowledge of fourth and eighth grade students around the world. TIMSS was developed by the International Association for the Evaluation of Educational Achievement (IEA) to allow participating nations to compare students' educational achievement across borders. (see [www.iea.nl/](http://www.iea.nl/) for details). TIMSS provides estimates of mathematics and science achievement and attempts to explain the performance using contextual information. The goal is to help countries make informed decisions about how to improve teaching and learning in mathematics and science.

### TIMSS in South Africa

The Human Sciences Research Council (HSRC) has conducted the TIMSS in South Africa since 1995. TIMSS was administered at the grade 8 or 9 levels in 1995, 1999, 2003, 2011, 2015 and 2019. In 2015 and 2019 the HSRC also conducted TIMSS at the grade 5 level. The South African participation in TIMSS has been successfully conducted as a result of joint efforts by the HSRC and the Department of Basic Education (DBE).

The national data from the 2019 TIMSS study at grade 9 and grade 5 level was analysed and the TIMSS SA results were released at the DBE on 8 December 2020.

TIMSS 2019: Highlights of South African Grade 9 Results in Mathematics and Science

TIMSS 2019: Highlights of South African Grade 5 Results in Mathematics and Science

We analysed TIMSS 2015 Released Items to produce the Item Diagnostic Reports for Grade 5 and 9. For these reports as well as any other information (and instruments and data ) you can refer to the TIMSS-SA (website: <http://www.timss-sa.org.za/>)

### **TIMSS Item Analysis**

After each TIMSS cycle the IEA releases a number of TIMSS assessment items – called ‘restricted use items’. From the TIMSS 2019 cycle the following numbers of items were released:

	<b>MATHEMATICS</b>	<b>SCIENCE</b>
<b>GRADE 9</b>	28	29
<b>GRADE 5</b>	12	22

## **Two (2) Service Providers/Consultants (one for science and another for mathematics) to analyse the data relating to learner performance**

**Ref No: Consultants-TIMMS-April 2021**

### **The Assignment**

The HSRC is looking to appoint TWO service providers/ consultants (one for science and another for mathematics) to analyse the data relating to learner performance. Consultants are expected to analyse each item and diagnose difficulties that learners may have encountered in understanding a particular concept and then recommend teaching and learning strategies to remediate the problem. Based on the CAPS documents, the service provider should also be able to identify the recommended grade that items are introduced at in South Africa.

In other words, the key research questions that will be answered are:

1. How did the learners perform on each item?
2. Which part of the South African curriculum does each item fit into?
3. What cognitive processes are required to correctly answer each numeracy question?
4. What types of errors have learners made in answering math/ science questions?
5. What action is recommended to remediate the problems identified?

The successful applicants will be given access:

1. The set of TIMSS 2019 released ‘restricted use’ items.
2. Each item will be categorised in terms of its content and cognitive domain.

3. Basic Item level statistics will be provided for each item: For Multiple Choice Items frequency of learner responses will be provided for each of the four options. For constructed response items, we will provide information on frequency correct, frequency incorrect response and frequency of omissions.
4. The scoring guide for the 'restricted use items only' produced by the IEA and used during the scoring process.

Drawing from theory or empirical studies (e.g. reviewing learner responses to the items), the task is then to write a short, succinct analyses of the learning problem and recommendations that educators can implement in their classroom to remediate the problem. The analysis should provide a clear indication of the weaknesses in learner responses and illustrate possible knowledge "gaps" and common misunderstandings that need to be addressed. Uncovering misconceptions or error patterns in the learner responses can directly inform instructional practice.

The audience for the Item Diagnostic Report will be mathematics and science educators.

### **Submission for consideration**

We are inviting researchers/ consultants to submit a 5-page proposal, which clearly describes how they will analyse the learner item performance data to produce a user-friendly item diagnostic report.

In addition to the proposal submitted, consultants need to submit a budget required to conduct this analysis.

You need to submit a full CV with at least two examples of similar work produced.

The proposal will be peer-reviewed and the HSRC will enter into a contract with researchers/ organisations with successful proposals.

The Item Diagnostic Reports will be peer reviewed by the DBE and reviewers appointed by the HSRC.

### **Key requirements for applicants**

- Experienced researchers/academics as evidenced by conducting mathematics or science item diagnostic analyses.
- A clear understanding of the South African Basic Education Curriculum Framework such as the CAPS is important.
- A Masters qualification in an education or social science related field. Speciality in educational assessment (especially mathematics or science assessment) is a bonus.

### **Timelines**

- The duration for the production of the Item Diagnostic Report is 6 months

## **Applications**

In your application please include a letter of motivation, your CV, names of two contactable referees, plus copies of two working papers/ journal articles. In your application please send a five-page proposal outlining your research plan.

The HSRC will only consider applications that include the above requirements.

Please submit your application to **Ms Mamello Theledi** at [scmhelpdesk@hsrc.ac.za](mailto:scmhelpdesk@hsrc.ac.za)

- **For queries, not applications, please contact: Ms Mmatseane Maja at [mmaja@hsrc.ac.za](mailto:mmaja@hsrc.ac.za) (Tel: 072 073 1769).**

Details about the HSRC can be found at [www.hsrc.ac.za](http://www.hsrc.ac.za)

Only applications that comply with the listed above requirements will be considered.

**Closing date: 18 June 2021.** We encourage applicants to submit prior to the closing date. If you do not receive any response from us within eight weeks, please accept that your application was unsuccessful. Only candidates who are interviewed will be advised of the outcome of their application.

**The HSRC reserves the right not to make an appointment.**

**APPLICATIONS FROM RECRUITMENT AGENCIES WILL NOT BE ACCEPTED.**