

TERMS OF REFERENCE

REVIEWING EARLY GRADE MATHEMATICS ASSESSMENTS AND LEARNER-TEACHER SUPPORT MATERIALS

1. Introduction

This is a call for services of an agency, a consortium of agencies or individuals to provide reviews of early grade mathematics assessments and learner-teacher support materials (LTSM). The project will be jointly funded by the Zenex Foundation, and Epoch and Optima Trust, which is represented by Tshikululu Social Investments. Zenex Foundation will however sign the contracting agreement with the successful bidder. The Department of Basic Education (DBE) will play the role of convening a Project Management Team (PMT) and providing oversight towards the project. The project is envisaged to start in the second half of 2021 and be completed by the end of the year 2022. The review will cover the foundation phase and intermediate phase.

2. Background

In recent years there has been a shift in focus in the education sector towards early grade literacy and numeracy. Previously, the focus was on ensuring that FET learners successfully completed Grade 12 and gained access to post-schooling opportunities. However, there is an increasing realisation among researchers and education stakeholders that intervening in early grades has the best prospects of improving learner performance in mathematics in later grades. Of the twenty-seven goals in *DBE Action Plan to 2024*, six are linked to improving learner proficiency and achievement in early grades numeracy and literacy.

The DBE is looking at implementing innovative ideas with respect to both resource provision and assessments in order to improve learner proficiency and achievement.

With respect to assessment, there are school-based assessments, local systemic assessments and international assessments. School-based assessments comprise both the formative and summative role in measuring and improving education outcomes. The role of formative assessments tends to be underestimated as they take the form of daily measurement of the progress learners make during classroom activities whilst summative assessments tend to receive attention as it involves end point results. In addition to school-based assessments, there has been a range of national, provincial and district-based systemic assessments which are administered to hold educators and school principals accountable for the performance of learners. Nationally, the DBE used to administer the Annual National Assessments (ANAs) for literacy and numeracy in early grades, but these assessments were decommissioned following disagreements between stakeholders. On the international level, South Africa participates in:

- the quadrennial Trends in International Mathematics and Science Survey (TIMSS) which are used by the education authorities as a form of benchmarks in mathematics achievements at Grade 5 and Grade 9 levels.

- the Southern and Eastern Africa Consortium for Monitoring Education Quality (SEACMEQ) assessments are used by the South African education authorities to track the progress that the country is making over a period of time relative to other African countries.

With respect to learner-teacher support materials, there is a high variation of practices amongst schools in terms of what resources they use and also how these resources are used in early grades mathematics. Some schools use the DBE workbooks as the primary learning resource, others use textbooks and other teacher designed worksheets. In other schools, workbooks are used in conjunction with textbooks and teacher supplied worksheets.

Internationally, there seems to have been different practices across countries with regards to learner-teacher support materials in early grade mathematics. A review of different practices in South Africa, as well as a comparison with other countries, will assist education stakeholders in making informed decisions with respect to learner-teacher support materials.

3. Purpose

The purpose of the scope of work is to provide a shared understanding of different forms of mathematics assessments that are conducted in schools in the early grades, and different forms of LTSM that are used by learners and teachers. With respect to early grade school-based assessments, the review should provide a shared understanding of current classroom practices and areas that require strengthening in order to support teachers. With respect to assessment instruments, the review should provide a shared understanding of what instruments exist in early grade mathematics; their purpose, relevance, appropriateness and current use across contexts similar to that of South Africa; and to identify recommendations for improvement in development and use of such instruments.

With respect to the LTSM, the review should provide a shared understanding of support materials that are used by learners and teachers in early grade mathematics classrooms, including support materials such as workbooks, lesson plans as well as manipulatives. The LTSM review should provide an indication of future work needed to close gaps that may exist in schools and promote the use of high quality support materials in the early grade phases.

4. Scope of Work

A review of early grade mathematics assessments and learner-teacher support materials by a service provider is sought to implement an analysis on assessments and materials that have been published in academic journals as well as in publications by government and non-government organisations, including multilateral institutions, since 2010. The review should also cover assessments and materials used in projects that have been completed or are currently underway by government departments and/or its agencies as well as by organisations that are not affiliated to the government. For assessments that are in the development phase or not yet in the public domain, the service provider will not be given access to such confidential information and would limit the focus of interviews to the processes being followed and the gaps experienced by the relevant programme managers.

A budget with a ceiling of R1,500,000.00 has been set aside.

Assessments Review

The assessments review has two components to it, namely, the school-based assessments and assessment instruments. Mathematics school-based assessments are conducted differently at each grade. Learners in the foundation phase (Grades R-3) seem to follow a mixture of oral, written and practical assessment programmes, while learners enrolled in the intermediate phase (Grades 4-6) seem to follow mainly a mixture of written and practical assessment programmes. There are also issues of language as the language of learning and teaching (LoLT) is determined by school governing bodies at the foundation phase, while the LoLT changes to either English or Afrikaans at the intermediate phase. There are also a variety of assessments instruments that are used for different purposes in early grade mathematics such as instruments that are used for describing the development of number concepts for learners.

The early grade mathematics assessments review should provide answers to the following questions:

- What are the different types of school-based assessments (e.g. formative, summative, etc.) prescribed by the curriculum and related guidelines (e.g. TMU Framework, CAPS)?
- How are the various recommended school-based mathematics assessments typically implemented in foundation phase and intermediate phase classrooms? What are some of the common practices and challenges facing teachers when it comes to school-based mathematics assessments?
- Standardised instruments or tools for assessments that have been developed (either locally or internationally) for diagnostic or evaluative purposes for mathematics in the early grades: Internationally, what are the most widely used or promising standardised tools that have been developed for similar contexts? Locally, which instruments or tools for assessments were developed for or adapted to the South African context, and in which languages?
- What large-scale research projects or programmes have been conducted to improve early grade mathematics assessment practices in South Africa over the last 10 – 15 years?
 - What were the key findings of such projects where they were completed and evaluated?
 - Were the recommendations feasible to implement on a large scale?
 - For projects that are on-going, what are the emerging results based on published research or unpublished reports?
- Based on expert interviews, what are the most important and urgent school-based assessment developments that should be focused on in the next few years?
- Based on the results of the assessments review, what recommendations can be made to ensure better provision and use of existing assessments instruments, and better school-based assessment practices?

Learner-Teacher Support Materials Review

The learner support materials (LTSM) appear to be limited to textbooks and workbooks in the majority of schools in South Africa. Some well-resourced schools supplement these materials with teacher issued worksheets and manipulatives. In addition, there are questions about whether monolingual support materials for learners are suitable in schools that change the

language of learning and teaching at the beginning of the intermediate phase to either English or Afrikaans.

For teachers, lesson plans, teacher guides, curriculum trackers and, to some extent manipulatives, are the primary support materials. However, it is not always clear whether all teachers make use of all these support materials during their mathematics lessons.

The early grade mathematics support materials review should provide answers to the following questions:

- What lessons can be drawn from international best practices in contexts similar to South Africa with regards to the provision of early grade mathematics LTSM and support for their use?
- What are the different types of LTSM prescribed by the curriculum and related guidelines (e.g. TMU Framework, CAPS) that are needed for teaching of mathematics in the early grades?
- To what extent have such materials been developed across the various grades and languages?
- Based on available data, research, and expert interviews, to what extent are these learner-teacher support materials available in schools?
- To what extent are these materials appropriately used in schools by learners and teachers?
- Based on published literature and expert interviews, are bilingual learner support materials effective in promoting mathematical proficiency in schools where the language of learning and teaching changes at the beginning of the intermediate phase? To what extent have appropriate bilingual LTSM been developed and made available in schools?
- Based on available data, research and expert interviews, does the national education department, provincial departments, and/or districts provide lesson plans, and if so, what is the extent of their use by teachers? Has any work been done to evaluate the effectiveness of such lesson plans on early grade mathematics teaching?
- What would constitute a minimum manipulative pack for each grade that mathematics learners and teachers need to successfully manage the demands of the curriculum? What would be the estimated cost for such a pack per learner and teacher? Aside from costs, are there any other constraints to the availability and use of such a minimum set of manipulatives, such as a lack of supply?
- Based on the case studies to be conducted and other available evidence, how well do early grade mathematics teachers make use of the support materials that are available to them?
- What are some of the LTSM used in major support programmes including projects undertaken by the National Education Collaboration Trust (NECT), the Provincial Education Departments (PED) and any other organisation undertaking relatively large-scale work in the sector? In projects that have been completed and evaluated, are these materials appropriate, and which of these materials appear to be cost-effective to deliver more widely, if not already widely available?
- Based on available research and interviews, what role do LTSM and manipulatives play in conducting effective school-based assessments? To what extent is a lack of LTSM and/or manipulatives a constraint to effective assessment practices?
- Based on the findings from the review, what are the most important and urgent mathematic LTSM development needs that should be focused on in the next few years?

- What recommendations can be made to ensure better provision and use of mathematics LTSM in the early grades?

Methodology

It is envisaged that the reviews of early grade mathematics assessments and support materials would take a predominantly qualitative approach. The successful bidder will be required to provide a review consisting of the school-based formative and summative assessments activities and projects that are undertaken in South Africa between Grades R and 6, specifying how assessments are conducted in each grade. The successful service provider should also include in the review assessment tools or instruments that have been developed for the South African context and make recommendation of relevant instruments that could be used in early grade mathematics. With respect to the review of support materials, the successful bidder should provide a review of literature on early grade mathematics with a particular focus on the role played by textbooks, workbooks (including DBE supplied workbooks) and manipulatives in learning and teaching. Included in the support materials' review should be some of the reforms to learner workbooks and manipulatives, as well as innovation to the use of lesson plans, guidelines, curriculum trackers, posters and manipulatives by teachers. The content of the review should include the following features:

1. Literature review;
2. Assessments review (expert reviews of most relevant assessment instruments);
3. LTSM review (expert reviews of most relevant LTSM);
4. Key informant interviews;
5. Case studies of six school (taking their different socio-economic statuses into account) to observe the use of assessments and LTSM; and
6. Desktop analysis of existing quantitative data on LTSM access and use (e.g. School Monitoring Surveys).

5. Deliverables

The project clarification and inception workshop that will be held with the successful bidder will determine the nature and the dates on which reports should be submitted. However, the following deliverables are expected:

- A project plan and timelines;
- Interim review reports upon the completion of each of the assessments review and support materials review;
- Final consolidated review of both early grade mathematics assessments and support materials toward the end of the year 2022; and
- Presentation to the Project Management Team and education stakeholders.

6. Proposal Submission

Activity	Dates
Opening advert	12 July 2021
<p>Submission of the proposals should contain the following:</p> <ul style="list-style-type: none"> • A short brief outlining how the task is understood. • An outline of the approach that the reviews of assessments and learner-teacher support materials will follow. This outline should include the methodology, data collection strategy, instruments to be used and data analysis. • Ethical compliance should be specified. • A detailed project and budget plan for the reviews with an indication of the amount of value added tax (VAT). • Timelines of the key deliverables. • The experience of the team that will undertake the research to be clearly stated. • Indication of the work that will be subcontracted, if any. • Company registration documentation including tax compliance certificate and Broad-Based Black Economic Empowerment contribution certificate. • The curriculum vitae (CVs) of the management team which should include the team leader and researchers that will undertake the research. 	
Closing date of submission of the proposals	6 August 2021
Shortlisting of proposals	27 August 2021
Interviews of shortlisted service providers	3 September 2021
Preliminary appointment of a service provider	10 September 2021
Contracting	1 October 2021
Clarification/Inception Workshop	8 October 2021

7. Competencies

The successful service provider should demonstrate competencies in the following areas of expertise:

- Previous experience in undertaking research focused on assessments and/or learner-teacher support materials.
- Previous experience in undertaking research using qualitative methodology and instruments of data collection.
- Comprehensive knowledge of the early grade mathematics sector in the South African education system and, to some extent, in the international context.

- Comprehensive knowledge of the Department of Basic Education policies on assessments and support materials.
- Previous research submission in a South African or international journal on early grade mathematics assessments and/or support materials will be an added advantage.
- Previous experience in developing assessment instruments and/or learner-teacher support materials will be an added advantage.
- Willingness and availability to work closely with the Project Management Team to ensure that deliverable timelines are complied with.

8. Criteria Weighting on the Proposal

Criteria	Weighting (%)
<p>Approach to the task</p> <ul style="list-style-type: none"> • The bid proposal should demonstrate clearly the approach the service provider will undertake to provide comprehensive review of early grade mathematics of assessments and support materials. • The bid proposal should clearly detail how deliverables will be achieved within the prescribed period of time. • All required documentation have been included in the application. 	40
<p>Profile and experience of the team</p> <ul style="list-style-type: none"> • Specific experience demonstrating previous work/research in early grade mathematics assessments and/or support materials. • At least one submission in a peer reviewed South African or international journal based on early grade mathematics or one reference report undertaking a similar project. • A diverse team of the service provider which include individuals who come from previously disadvantaged backgrounds, including black and female researchers. 	20
<p>Organizational capacity</p> <ul style="list-style-type: none"> • Preference would be given to bidders who demonstrate the capacity to meet deliverables timelines. • The senior management of the service provider should possess the necessary technical capacity and knowledge. • Detailed curriculum vitae (CVs) of the key individuals who would act as lead researchers in the reviews. 	20
<p>Price</p> <ul style="list-style-type: none"> • Detailed budget by the service provider specifying the bid price, exclusive of the value added tax (VAT). 	20
Total	100

9. Contracting

The successful bidders' proposals will be submitted to the Zenex Foundation's board during September 2021 for approval. Thereafter, the implementation plan for assessments and support materials review will be finalised as well as deliverables and the timing of reports to be produced before the contract is signed by the successful bidder and the Zenex Foundation. The contract will be subject to the terms and conditions as well as regular performance reviews by the Project Management Team who may discontinue the contract for substandard work. Zenex Foundation will make payments within 30 days following the submission of invoices on condition that the agreed deliverables have been complied with.

10. Project Management and Governance

The Project Management Team (PMT) will oversee the appointment of the service provider and the subsequent management of the project. The PMT will be composed of the DBE, Zenex Foundation, and Epoch and Optima Trust, which is represented by Tshikululu Social Investments. Zenex Foundation will be the contracting organisation with the appointed service provider. The DBE will convene and co-ordinate the work of the PMT to ensure that all deliverables are achieved within the target period of time.

11. Intellectual Property

The appointed service provider will assign the copyright of the reviews to the DBE and, where appropriate, to Zenex Foundation and Tshikululu Social Investments. This will include data, instruments, documents and reports that will be produced out of the reviews.

The service provider may seek to use data emanating from the research subject to ethical application to the DBE, Zenex Foundation and Tshikululu Social Investments. Such a request will not be unreasonably withheld by the DBE, Zenex Foundation and Tshikululu Social Investments provided that the use of such data does not lead to a conflict of interest, expose DBE's confidential data or information, and that the service provider commits to make use of such data to make a meaningful contribution to early grade mathematics research. In addition, such a request by the service provider should acknowledge the role of the DBE, Zenex Foundation and Tshikululu Social Investments when reports and presentations are produced.

The results from the reviews will be shared with stakeholders in the basic education system such as schools, donor agencies including key role players in the education sector within the DBE and outside.

12. Contact Person for Queries and Submission

Queries related to the submission of proposals should be emailed to Nompumelelo Nkabinde at mpumi@zenexfoundation.org.za, alternative through telephone +27 11 481 7845.