

Multilingualism in Foundation Phase mathematics

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Background – Policy, LTSM, Assessment

- ▶ Language in Education Policy (LiEP) promotes multilingualism (DBE, 1997).
- ▶ Department of Basic Education (DBE) interpretation of LiEP: Schools provide education in all of the eleven official languages of South Africa (FP) and they should respect the individual language of all learners – allow choice of language of teaching and learning (LoLT) to be used in the Foundation Phase (FP).
 - ▶ Multilingualism is seen in the provision of schooling around the country rather than in the individual schools or classrooms that make up that whole.
- ▶ Multilingual materials support:
- ▶ Curriculum Assessment Policy Statement (CAPS) for mathematics and other LTSM (e.g. DBE workbooks, textbooks on the national catalogue list) are produced in all eleven official languages.
 - ▶ Monolingual texts are provided but appropriateness and consistency of mathematical vocabulary is not guaranteed.
- ▶ Standardised national assessments such as the Annual National Assessment (ANA) are set in all eleven official languages and issued to schools according to their chosen LoLT (monolingual).



Background – Language as a tool

- ▶ Studies on the learning of mathematics in multilingual contexts argue that the emphasis needs to be taken off the LoLT and focus on the learning of mathematical concepts. (Adler, 2001; Moschkowich, 2002; Setati, 2008).
 - ▶ The use of language should not detract from the learners' ability to make conceptual generalisations.
 - ▶ Research in South African (and other) classrooms has shown the benefit of using more than one language in a classroom when teaching mathematics but a power play between languages has been noted (Setati, 2005).
- ▶ FP CAPS, in its interpretation and application of the LiEP, attempted to address the power play by shifting the dominance of English.
 - ▶ The shift to home language (HL) as LoLT was implemented with the assumption that conditions were there for monolingual classes, according to a chosen LoLT, to allow learning of mathematics to happen in HL.
 - ▶ Currently the majority of FP teachers in schools were prepared to teach mathematics in English/Afrikaans, not other HL. This is changing.



Background – Language as a tool

- ▶ An unintentional side-effect of the work to ensure curriculum policy compliance on behalf of teachers is that monolingualism in the mathematics class has been promoted (albeit in the LoLT).
- ▶ In practice language use in South Africa is not generally purist (monolingual), it is pluralist. A pluralist use of language recognises the multilingual and multicultural body of learners populating schools in SA.
- ▶ Research that shows that learners learn more effectively and perform better when their foundational learning is given in the HL.
 - ▶ There are benefits seen from the use of pedagogically motivated code-switching (Adler, 2001; Barwell, Barton & Setati, 2009; Setati & Adler, 2000).
 - ▶ More recently much talk about ‘translanguaging’ (Garcia & Wei, 2014; Lewis, Jones & Baker, 2012; Makalela, 2015), a practice intended to take the emphasis off the LoLT (monolingual) and allow freedom of expression (multilingual) in order to promote understanding of concepts.
- ▶ The question remains – what would be best for FP learners in SA classes?
- ▶ What choices have been made in other similar contexts?



Project

Researching multilingualism in FP maths

- ▶ A **two year research project** with **five research tasks**. Aligned with the five project tasks, the study will investigate the following broad questions:
 1. What is the current situation in primary schools with regard to HL and LoLT?
 2. What inconsistencies in mathematical register (focus on isiZulu, Setswana and English) in the area of ‘patterns’ are identifiable in FP teacher and learner support material?
 3. What variation can be seen in the use of language related to ‘patterns’ (isiZulu, Setswana, English) among district officials, teachers and learners in Gauteng?
 4. What model (monolingual/bilingual/multilingual) of language use is perceived by teachers and learners to be dominant in FP mathematics classes and what do they think are the effects of this language practice?
 5. In the multilingual South African context, what strategies, techniques and resources do FP mathematics teachers use to inform their mathematical conversations in the classroom, and how do they use these?
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Task 1: Status of the LoLT

Map the current situation according to languages spoken and taught in the FP in SA schools in order to give background insight into contextual issues. Issues such as these could undermine policy goals.

▶ Sample:

- ▶ EMIS data (2008-2016) used to write sequel to the 'Status of the LoLT' report (DBE, 2010)

▶ Findings – to date

Findings show trends follow on from those established in the previous report, with some variation. Detail all in the report.

- ▶ HL of learners – population trends and spread not much changed.
 - ▶ LoLT (English in the school system) 2016: 62,9% (2007: 65,3%)
 - ▶ LoLT in FP: previous trend away from English LoLT but moving back towards English. (2007 – Grade I Eng 21,8%, IsiZulu 23,4%, 2016 – Eng 23,8%, IsiZulu 20,1%)
 - ▶ Number of parallel medium schools has increased. Variation in languages at parallel medium schools has increased.
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Task 2: Variations in Language Use - LTSM

Investigate anecdotal evidence that there is a lack of standardisation of mathematical vocabulary for certain ‘technical’ words needed in the teaching of FP mathematics and that errors of translation are found in ‘reversioned’ publications.

▶ Sample:

- ▶ CAPS Grade 3 and 4 (Topic 2 – Patterns)
- ▶ DBE Grade 3 and 4 Workbooks (2017/2016: worksheets on Topic 2 – Patterns)
- ▶ ANA Grade 3 and 4 (2013, 2014, 2015 – items on Patterns)
- ▶ Platinum Mathematics Grade 3 and 4 (LB and TG – sections on Patterns).

▶ Findings – to date

- ▶ There are errors and omissions in translation which could compromise learning and teaching.
- ▶ Variation in language use is present. ‘Standardisation’ is a goal (for some) but is it a solution?
- ▶ The transition from Grade 3 and 4 is a leap – may be beyond the capacity of many.



Task 3: Variations in Language Use – Spoken language

Survey to further investigate language spread (Task 1) and use (Task 2) in the school system. Survey district officials, teachers and learners to get background information on languages spoken and evidence of language use.

▶ Sample:

- ▶ District officials - Gauteng district officials (30 officials)
- ▶ Grade 3 and 4 teachers in Gauteng schools in three districts – 7 LoLT IsiZulu, 6 LoLT Setswana, and 6 LoLT English (formerly IsiZulu/Setswana) schools. (60 teachers)
- ▶ Grade 3 and 4 learners at the same 20 schools in Gauteng: Two classes each of Grade 3 and Grade 4 learners from each of the schools. (3200 learners)

▶ Findings – to date

- ▶ Teachers are teaching in languages not their HL, learners are learning in languages not their HL (extent and effect of this needs to be investigated).
 - ▶ Language preference when giving explanations for solutions varies – HL/English.
 - ▶ Knowledge of mathematical vocabulary varies – district/teacher/learner.
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Research Tasks 4 and 5: 2018

Gather **observation** and **interview** data to paint the picture of how FP teachers and learners use language in their mathematics classes.

▶ **Sample:**

- ▶ The classes of one of each of the Grade 3 and 4 teachers in the same Gauteng schools where the survey was carried out. Three districts – 7 LoLT IsiZulu, 6 LoLT Setswana, and 6 LoLT English (formerly IsiZulu/Setswana) schools. (40 teachers and the learners in those classes - TBC)
- ▶ Focus group discussions with Grade 3 and Grade 4 teachers at the 20 schools. (80 teachers – TBC)

▶ **Investigating:**

- ▶ Evidence of current practise with a view to considering what is best practice for teaching in multilingual classes.
 - ▶ Ways in which teachers use LTSM, teaching strategies and techniques to facilitate their planning and to support classroom learning in Grade 3 and Grade 4 multilingual classes.
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Take home points

- ▶ How can the system better provide for the varied needs of learners in terms of language – LoLT?
 - ▶ Recognise the variation present.
 - ▶ Promote strategies (code switching/translanguaging) that could enable more effective learning.
- ▶ How can the system better provide for the varied needs of learners in terms of language – LTSM?
 - ▶ Investigate the affordances of multi (bi) lingual materials.
 - ▶ Provision of materials which enable best learning opportunities.
 - ▶ The ‘standardisation’ debate needs to be actively addressed.
- ▶ What teacher support is needed in the current context to address their needs and their ability to provide optimal learning opportunities for all learners?



Thank you

...in an increasingly heterogeneous world, where children in school are of all kinds and bring different language practices, the only way to build equitable educational systems is to **develop multiple multilingual programs** that acknowledge translanguaging as a resource for engaging cognitively and socially, as they develop standard ways of communicating in dominant languages. (Garcia, 2009, p. 157)

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