

**SUPPLEMENTARY
TUITION IN
MATHEMATICS AND
SCIENCE**

**Vijay Reddy
Bobby Berkowitz**

HSRC RESEARCH OUTPUTS
3429



Purpose of Presentation

To report on the findings of a DST-commissioned study into Mathematics and Physical Science supplementary tuition programs in South Africa.



Research objectives

1. To evaluate the usefulness, in terms of quality, impact and cost of the different types of interventions
2. To develop models of supplementary tuition interventions that can serve different types of learners and which can be replicated in different parts of the country
3. To present a strategy document, including resources needed, to the DST to expand the programmes to allow access to a greater number of learners



Phase 1 of study...

In Phase 1 we created 5 categories of supplementary tuition service providers:

1. Tertiary institutions
2. Non-governmental organisation
3. Science Centres
4. Franchises
5. Mass-based media offerings


DATA FOR CASE STUDIES

Typology	Data sources
Tertiary sector	University of Pretoria (UP with Science) University of North West (Ikataleng) Nelspruit Technikon University of Durban Westville (Upward Bound) University of Western Cape Outreach programme SAUVCA
NGO sector	SEASA, SALLI Programme, Imfundo, Maths Champ
Science Centre	University of Zululand Science Centre MTN Science Centre in CT MTN Science Centre in Dbn
Franchises	Kumon Math, Master Math, PLATO
Media Sector	Liberty Life Learning Channel on SATV Mindset on DST



1. TERTIARY SECTOR

- Long history of supplementary tuition provision.
- ⊕ Targets Black learners: studies are sponsored.
- ⊕ Intention: learners then register for science courses at their tertiary institutions
- Programs generally operate in small groups; with cohorts attending over a period of a year or two.
- ⊕ Most programs are curriculum-based, but some focus exclusively on exposure to scientific activities



Tertiary sector (cont)

- ● Programs also include life skills and career-choice components
- ● Exposure to “non-usual” careers is particularly important to learners from disadvantaged backgrounds
- ● Programs rely on external funds to operate
- ● Costs range from R800 to R3200 per learner per year
- ● Tertiary institutions are well placed to provide these programs because they already have the infrastructure, organizational structure and human resources



2. *NGO sector*

☉ Targets mainly urban-based learners

☉ Two types of programs: individualised tuition and structured, group programs (OUR FOCUS)

☉ Structured program combines knowledge, life skills, exposure to industries and career choice assistance

☉ Programs follow “school format”, with experienced and knowledgeable teachers.



NGO sector (cond)

- ● "Code-switching" and selecting positive role models as tutors are particularly powerful components of this model
- ● Learners are sponsored to attend the program
- ● Some programs provide university bursaries
- ● Rate of attendance is high
- ● The cost of program varies between R1700 and R7300 per learner per year



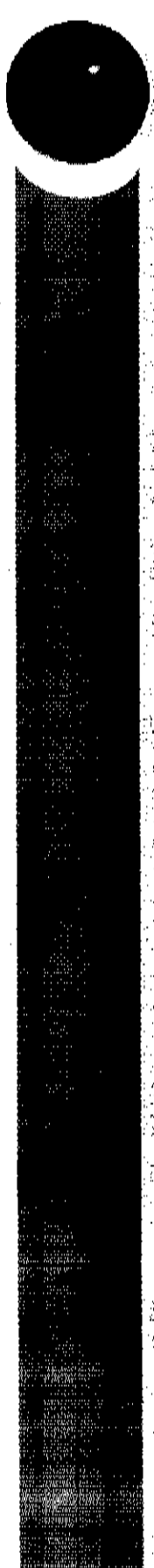
3. SCIENCE CENTRES

- Well-resourced public spaces for science awareness and interest - can be used to offer Supplementary Tuition programmes
- Operate on "soft" money and are therefore an expensive option for interventions
- Costs of prospective program is about R4000 per learner per year for urban learners and about R7500 per learner per year to accommodate rural learners



4. FRANCHISES

- ● Profit-driven operations – tuition provided on a “user-pays” basis
- ● Offer individualised tuition at learner’s pace
- ● Program involves diagnosis of learner knowledge, revision of concepts, practice exercises and feedback from tutors
- ● Lessons are organised into learning modules
- ● MasterMaths (MM) and PLATO are computer-based programs




Franchises (cont)

- ● Kumon involves paper and pen exercises
- ● MM is curriculum-based whilst PLATO and Kumon are "concept-based"
- ● Costs of Computer-based franchises are large and focused on equipment
- ● Payment from learners is on a monthly basis and is about R400 per month



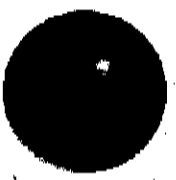
5. MEDIA SECTOR

- Covers radio and TV broadcasts, print (newspapers, books and magazines), online instruction (internet and multimedia cd-roms) and video and dvds
- We focused on the TV broadcast medium – Liberty Learning Channel on SABC3 and Mindset Activate on DSTV
- Liberty Learning Channel is a 'live' program, where a tutor links up to learners via telephone and answers their questions on live television



Media sector (cont)

- Mindset broadcasts pre-recorded lessons
- Liberty Learning Channel is curriculum-based whilst Mindset only covers Gr. 10 material
- Both TV broadcasts are supplemented with educational materials delivered through other media channels




KEY FINDINGS & RECOMMENDATION

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1. From our case studies a better typology would be:

- Face-to-face instruction to small groups
- Individualised instruction
- Mass based instruction.

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2. Small group face to face instruction seems effective for developing knowledge, skills and concepts, and influencing career choices. It is expensive, but effective. This form of tuition provides a means for increasing output of quality higher grade passes and it is recommended that the DST targets learners in African schools, especially in rural areas.
- Providers can be encouraged to apply for funds to DST.

3. Individualised instruction is also expensive but equips learners with the means to proceed at their own pace on areas they want to.

The DST should offer bursaries for higher-grade learners from the townships to attend programs that offer individualised instruction.

In addition the DST should negotiate with the private sector to make individualised instruction accessible to rural learners.

Consider translation issues.

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4. Mass based instruction - The DST should engage with funders and programme designers of mass based instruction programs to encourage the offering of a pedagogically sound programme. Such a program will build the learners' concepts and demonstrate concepts that they would otherwise not interact with in the regular classroom situation. Consider language issues.