SKILLS SHORTAGES: BARRIERS TO INCLUSIVE STEM EDUCATION

THE CASE OF SOUTH AFRICA
CONTEXT

- South Africa is an emerging market, middle-income country
- High levels of inequality, unemployment (27%) and poverty
- 24 years since legislated segregation (Apartheid)
- One of Africa’s biggest and developed economies
- 11 official languages
BARRIERS AND SOLUTIONS

1. **Shortage of qualified teachers**

   - Many teachers are not confident in content knowledge
   - Most teachers were trained in the old classroom/lecture methods of teaching
   - Limited continuous learning opportunities for teachers
   - Public v private schooling (inequality)
   - Brain drain (good teachers go into high-paying private sector jobs)
BARRIERS AND SOLUTIONS

A. Solution to shortage of qualified teachers

- Better conditions of service and retention for STEM teachers
- Offer development / improvement of knowledge for teachers to boost their confidence
- Develop teachers’ new roles as coaches and facilitators of knowledge acquisition
BARRIERS AND SOLUTIONS

2. Socio-economic factors

- Many schools in rural areas and townships lack facilities, such as labs. Science experiments are “imagined” or read from textbooks.
- ICT is not easily accessible to poor parents and their children. So research is limited to textbooks, which are not always up to date with the latest trends.
- Poor preparation for higher education leads to high dropout rates.
BARRIERS AND SOLUTIONS

B. Solutions to socio-economic challenges

➢ Public-Private Partnerships can supplement Government’s subsidies to schools. Companies can donate resources and skills to schools (some do it as part of CSI).

➢ Government can prioritise ICT / STEM in public schools’ budget allocation (e.g. Gauteng Dept of Education gives public schools computer tablets and internet connectivity)

➢ Private companies can invest in skills development (in Feb 2018 BMW SA unveiled a USD6m training academy in Rosslyn, Pretoria to train staff and the public on automotive, electronic and related sector technologies.)
BARRIERS AND SOLUTIONS
3. Constraints within school system

- Traditional design of tertiary curricula (aimed at 3 or 4 year qualification) not always appropriate for fast changes in the world of work.
- No or little collaboration between policy makers, educators and employers to design responsive, skills-based curricula. This churns out unemployable graduates.
- Late introduction of English in some schools leads to delayed understanding of most STEM concepts, which are foreign to African languages.
BARRIERS AND SOLUTIONS

C. Solutions to constraints within school system

- Business should lead on skills debates and shape national and sector skills policies. Sometimes short, targeted courses are better at producing relevant skills.
- Where necessary, Business to “grow own timber”, e.g. BMW case.
- Government should be decisive about English at earliest age possible to facilitate ease of learning (competition is international and not national).
4. Diversity in schools and workplaces

• Most schools and teachers in SA are not equipped to deal with children with “different” needs. Children’s individual pace of learning gets compromised.

• Children with learning disabilities often get left behind, or drop out of school. There is inadequate accommodation in schools for their needs.

• Tertiary institutions are obliged by law to accommodate students with disabilities, but the cost of adaptation often leads to affordability issues in most universities, thus restricting access.

• Despite employers being required by the Employment Equity Act (1998) to accommodate people with disabilities, there is very little evidence of their absorption in most workplaces.
**BARRIERS AND SOLUTIONS**

**D. Solutions to diversity in schools and workplaces**

- Equip schools and teachers with capacity to deal with different learners (*resources* and *capacity-building*)
- Make employment equity work in the workplaces, so learners can have *role models* (e.g. BMW SA recently appointed their own training academy graduate as the first Black female *Production Manager* in their Assembly plant)
- Deal with the *perceptions* that STEM professions are a “male” domain
CONCLUSION

• SA has many challenges, largely socio-economic in nature, which impact on the country’s ability to produce the skills of the future at the required pace.

• Collaboration between policy makers, educators and the business sector is the only viable way to address the skills shortages crisis. Employers know better the skills they require, and so they should influence curricula design and skills policies to respond accordingly.

• More needs to be invested in the pipeline from early schooling, through to tertiary and the workplace, to craft and develop the necessary focus on STEM education and skills.