Desmond Tutu Training Program, mathematics and more

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VU-NRF program

The Desmond Tutu training program: set up by VU and National Research Foundation (South African "sister" of NWO).
First phase 2008–2014, 18 PhD candidates.

Goal: build human capital in terms of PhD's in South Africa, by fostering double degree programs between VU and South African universities.

PhD candidates have supervisors in The Netherlands and in South Africa.

They spend two months per year in The Netherlands.

Ambition: a LOT of PhD's in the coming four years. Two calls per year with 10 to 15 projects per call.

VU-NRF program

Currently Memoranda of Understanding with many South African universities.

University of the Western Cape (UWC)

University of the Free State (UFS)

University of the Witwatersrand (Wits)

Stellenbosch University (SUN)

University of Cape Town (UCT)

University of Pretoria (UP)

North West University (NWU)

University of Kwa-Zulu Natal (UKZN)

University of Johannesburg (UJ)

University of South Africa (UNISA)

Already several PhD's awarded.

Open call university wide. Actually there is a position available for a South African PhD working in the area of ICT4D, under supervision of Prof. Hans Akkermans.

Desmond Tutu chairs

Currently there are seven Desmond Tutu chairs: in Economy, Theology, Human Movement Sciences, Medicine, Biology, Physics and Mathematics. There is one vacancy in Social Sciences.

These people participate intensively in the DTTP program, but are by no means the only ones.

South Africa is one of the focus countries of the VU for international cooperation.

Why a mathematician?

Long standing relations in mathematics between The Netherlands and South Africa.

In the late eighties/early nineties two PhD students in mathematics from South Africa supported by the VU and Equal Opportunities Council (Desmond Tutu was involved in this).
One was Gilbert Groenewald, currently at North West University.

Contacts remained, and intensified after 1994.

Currently close ties with North West University: many collaborations, already the fourth joint PhD student is under way (the second one in the VU-NRF program), he is at the VU untill the end of this month.

Several other South African students are interested in obtaining a PhD outside the VU-NRF program.

Why is mathematics important for society anyway?

Recent reports of Deloitte (international accountancy firm).

NL 10% of Dutch gross national product is directly based on mathematical activity.

UK 13% of British gross national product is directly based on mathematical activity.

Germany and France Similar to UK.

Indirect effects also taken into account. It then comes to about 25% to 30% in these countries.

The situation for South Africa will not be much different, probably comparable to The Netherlands.

Future outlook

These numbers will go up significantly.

- more quantification
- more mathematical modeling and simulation
- big data and curse of dimensionality

More application areas

Traditionally math is applied in science and engineering.
Only becomes more important in these areas.

New areas

- Optimization of use of resources
- Complicated technological systems
- Business analytics
- Optimization of business processes
- Data mining
- Financial sector
- Safe electronic communication
- Life science and medical applications

New applications require new mathematics.

Examples

Statistical procedures used to search in big amounts of DNA data (genomics).

Communication with the bank uses encryption based on number theory results that date a while back.

Applications of mathematics may have a long time horizon.
It is not predictable which current research results will have an impact on future technology, but one thing is certain:
it will not be what policy makers now think it will be.

But it is clear that much of the impact of mathematics is directly related to developments in ICT, Science and Technology.
These in turn require progress in mathematics.

Maintenance

Maintaining a high level of math knowledge and math literacy in society requires a high level of math education on all levels,

as well as

a strong mathematical research community.

Teachers and researchers.

Funding for mathematical research is necessary, but also for research in math education.

South African project in math education

South African perspective: learning mathematics in English at high school level poses an extra hurdle.

Mamokgethi Phakeng (UNISA), research "focusing on developing relevant/appropriate pedagogies for multilingual mathematics classrooms".

This is something we can learn from!

In big cities in The Netherlands the same problem occurs: learning mathematics and sciences at high school in a language that is not the mother tongue of many of the students poses an extra problem.

Different initiative in education: North West University

Distance learning: more than 10.000 students are distance learners.

Current focus areas: education, post-basic nursing (health sciences), theology.
Also many short courses.
Other programs in development.

Facilitated by good ICT.

Thank you for your attention