



## Message from the NSTF Executive Director

### Save our science

The annual [2023 NSTF-South32 Awards](#) were made recently on 13 July. The line-up of [winners](#) was excellent as usual, and makes us proud to be South African. We celebrate and honour their achievements wholeheartedly.

But will South Africa be able to keep up the high standard of researchers in the national system of innovation for the foreseeable future? Severe funding constraints are being experienced in the system – from both the public and private sectors.

Funding for science was cut in the context of the COVID-19 pandemic. See [Science faces 'survival' crisis in wake of Covid-19 funding cuts - Research Professional News](#), as a reminder. Over the years, the income of research institutions has also not kept pace with inflation.

The very latest report on science, technology and innovation indicators: [141483-DST-Report-25-July-12h20.pdf \(naci.org.za\)](#) contains the figures that should raise red flags. It says: "Considering the low GDP, it is particularly concerning that gross expenditure on research and development (GERD) as a percentage of GDP declined to 0.62% instead of moving towards the 1.5% target."

The latter target of 1.5% was mentioned in the [Science and Innovation Budget Vote](#) as recently as May: "We also remain resolute to increase gross domestic investment in research and development as a percentage of gross domestic product, with the aim of achieving the National Development Plan's target of 1.5%."<sup>1</sup>

If only we had stuck to the previous target of 1% of GDP... but even then, the investment in this critical area of the country's development falls far short.

Business sector expenditure on research and development (BERD) in 2019/20 was less than a third of the previous figures that were reported, and went on to decrease further. It is not surprising that private sector investment in R&D would fall steadily, in our fast-deteriorating economy where uncertainty is the order of the day (due to loadshedding, crime and political uncertainty, among other things).

The Report goes on to say: "Changes in the levels of investment in research and development (R&D) affect innovation and economic performance. Reduced investments in R&D have resulted in fewer scientific publications, patents granted and receipts from the sale of South African intellectual property. The share of total scientific publications in Engineering and Technology decreased from 28.2% in 2019 to 22.2% in 2020, while social science publications decreased from 30.2% to 27.5% over the same period."

The inevitable results of the dwindling investment and outputs in science and scholarship described above, are predictable and are already taking place:

- Young people with qualifications in science, engineering and technology (SET) will not find suitable opportunities in the country of their education, and will leave for overseas at the first

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<sup>1</sup> See also [Science and Innovation budget 2023-24 - vulekamali](#) for the actual budget figures.

good offer. As has often been the case, many will settle there and not return unless there is a favourable climate for them to apply their talents and skills here for reasonable remuneration.

- Once funding is cut to the research sector, deterioration sets in almost immediately, whereas it takes many years to establish a science sector such as ours, on a sound foundation. Research entities are not created overnight – their experts and teams require their salaries, specialised up-to-date equipment, specialised materials, facilities with services, and postgraduate students and post-docs. The costs of these never go down, always up. All our gains will be lost if the science system continues to be neglected.
- South Africa is already behind the curve of global technological developments. We have not made much progress in contributing to 4<sup>th</sup> industrial revolution technologies e.g., there is relatively little expertise on artificial intelligence, and still very low uptake. How are we expected to catch up and keep up if the essential funding is not provided?

The Department of Science and Innovation (DSI) has worked hard over the years to grow the country's capacity for research and innovation. It has never received sufficient funding to drive the country's R&D spend up to even a mere 1% of GDP. In the poor economic state and other conditions that South Africa is in, the private sector is highly unlikely to invest in R&D to the extent that it would drive the investment proportion up to 1.5% or even 1% of GDP. It is only the government as a whole that can make such a crucial investment for the future of our country.

*[Dr. Tebogo Mashifana](#), Senior Lecturer, Researcher, and Head of Department: Chemical Engineering Technology at the University of Johannesburg (UJ) wrote an [opinion](#) piece that first appeared in the [Independent Online](#) on 4 April 2022, and was then published by UJ's [Department of Chemical Engineering Technology](#) on 5 April 2022:*

“A study has found that PhD graduates are often excluded from the recruitment space because they are seen as overqualified by human resource personnel.”

Dr Mashifana makes valid points, which are very concerning. Indeed, one has to question the value of a PhD if graduates cannot find relevant employment. This phenomenon is all the more worrisome when reported on by a head of a department of chemical engineering technology, where the subject matter is ultimately meant to be practical and applied to solving real problems, and therefore would make the graduates eminently useful and employable.

In the past, there was indeed a strong push from the DSI to promote doctorate degrees, and the DSI provided bursary funding for many PhD students through the National Research Foundation (NRF). But those days are over, and postgraduate bursaries from the NRF are few and subject to restrictions, including a low age limit and a short time limit for obtaining the degree. One of the long-standing restrictions is that bursaries are only provided for full-time study. The combination of these two conditions means that students have to study continuously for many years post-school, without working. They are therefore not very employable when they finally reach the great milestone of a PhD, lacking experience, confidence, the know-how that comes with practical work as well as the track record. This is unfair to the students as well as the prospective employers. I would say that postgraduates should be allowed to combine work and study, and not be subject to age restrictions.

PhDs are crucial for research and academic teaching, and although it might seem that South African universities have ‘over-produced’ PhDs, nothing is further from the truth. A PhD may not prepare the bearer to do any work other than in research and academia, but we cannot do without them!

The above decisions regarding restrictions on postgraduate bursary funding were made a few years ago, as a result of a shortage of state funding for the science and innovation sector. In my opinion, this situation should be turned around if South Africa is to have any chance of holding her own in research and innovation in years to come.

Perhaps we should remember: science, research, higher education, innovation, technology, skills, basic education, the 4IR, AI, global competitiveness... these concepts are all inter-related and inter-twined. A solid research sector (at universities and research institutes) ensures a sound higher

education system, which makes it possible to maintain itself and train students to work at universities across the world. Good research outputs enable innovation of a sophisticated kind, contributing to the country's competitiveness, and provides bodies of knowledge that can inform decision making of all kinds, including that of the government. South Africa can still hold its own among the best researchers, research teams and institutions in the world. This is an invaluable legacy that should not be neglected.

This is also, after all, the reason for the brightness of the stars of the NSTF-South32 Awards.

***The opinions expressed above are those of the Executive Director, Ms Jansie Niehaus, and do not necessarily reflect the views of the [Executive Committee](#) or [members](#) of the NSTF.***