Education

Integrate science, don't segregate it

Incorporating the best of Western and indigenous knowledge is a better approach for universities

COMMENT
Kishen Mahesh

Colonisation is defined as "the action or process of settling among and establishing control over the indigenous people of an area".

For a continent such as Africa, this rings true. But, in recent times, following the controversial #FeesMustFall campaign, a new agenda has come to light — the decolonisation of science in South Africa.

If we refer back to the definition of what colonisation is, then the antithesis of it would be to return control and governance back to the indigenous people.

South Africa is no stranger to this concept. In the context of science, and by extension education, I struggle to understand the complexity that seems to surround this topic.

Science can be seen as mutually exclusive to that of politics and colonialism. But its use to drive ulterior motives in both these spheres is not unknown to mankind in general. Science in its absolute essence is merely an acquisition of knowledge, interpretation and application to real world scenarios. It presents itself as a source of information or knowledge generation that is acquired and easily transferred from one person to the next. This can be through various platforms such as direct communication or teachings that have been recorded through time.

Science, like all other fields that contribute to world knowledge, can be described as global but its origin can be ethnic or cultural. Taking into account the multilingual and multicultural footprint of South Africa, facilitators of scientific knowledge to students must also strive to create a platform that allows them to build on knowledge being taught by relating it to experiences they have had.

It is no surprise that, even after 22 years of democracy, South Africa is still in a state of transformation with this. For science, transformation can be slightly problematic. Certain methodologies, core principles and fundamental teachings come from Western-based scientists. Although it can be debated that some Western sciences have their origins in Africa, I shall not discuss it in this piece.

A key example of fundamental teachings can be illustrated through the field of genetics. Gregor J Mendel has been dubbed the father of genetics. His findings helped to establish the rules for heredity, now known as Mendelian inheritance.

The concepts taught to students cannot be ignored, however, core principles can be expressed through local examples. Thus the theory remains "Western" but the application is local.

Does this mean there is no place for Afrocentric science?

Calling for change: Attempting to classify science as 'colonial' or 'traditional' detracts from its purpose — namely the acquistion of knowledge, its interpretation and application. Photo: Rodger Bosch/AFP

Science in Africa and more specifically South Africa is a fast-growing field. We continually strive to improve the health and wealth of this country by improving our healthcare and pharmaceutical standards. South Africa produces top-class scientists.

Professor Himla Soodyall, for example, is an internationally known research scientist in the field of African genetic ancestry and anthropology. She has contributed to many local and international research projects, most notably in her position as the principal investigator for sub-Saharan Africa for the National Genographic project.

Furthermore, the incorporation of Afrocentric knowledge is considered to be a rich resource for a number of scientific research outputs.

The government ensures that should patents be derived from an indigenous biological or genetic resource or traditional knowledge then those who wish to file their application with the patent's office are obliged to disclose their source of indigenous knowledge. This allows for determining equitable and fair compensation.

We cannot ignore the resources that traditional knowledge brings to the field of science and thus must be catered for. South Africa's alternative medicine practices such as homeopathy are taught at various institutions around the country.

Furthermore, ethnomedical practices are legislated for by the Traditional Health Practitioners Act and many people still consult alternative non-Western health practitioners.

Can we ignore colonial science?

Whether we choose to admit it or not, "Western" science is an integrated part of South Africa's science and technology sector. Given the international profile of science, disregarding Western scientific theory and practices would be detrimental to the country as a whole.

This is especially true in a university-type setting where the generation of new knowledge through various research programmes needs to contribute not only to local initiatives but to be able to stand as a formidable player on the international scientific playground, thus attracting global recognition and encouraging futher investment.

A prime example of how Western-based science has helped South Africa is the unfortunate "either/or" scenario that former president Thabo Mbeki applied between Western pharmaceutical industries and traditional medicine. His stance on the matter led to the state failing to provide antiretroviral therapy during his term as president. During this time UN Aids estimated mortality figures for Aids-related deaths to be about 400 000 in South Africa alone in 2009.

Overall, scientific research, be it local or international, eventually becomes global knowledge. Attempting to classify science as colonial or traditional detracts from the purpose of science.

The current setting in South Africa paints a segregated picture between Western science and indigenous knowledge systems.

But a more integrative approach is likely to work best. Institutions of higher learning are making a concerted effort to transform their curricula into ones that maintain the fundamentals, thus allowing one to receive international recognition and to apply such teachings on a more local scale.

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Pupils' 20% pass reflects crisis in maths teaching

COMMENT
Elizabeth Walton

Many South Africans were outraged by the recent announcement that, for 2016, pupils in grades 7 to 9 could progress to the next grade having achieved only 20% in maths.

The minimum has been 40%, provided that all other requirements for promotion are met. Pupils with less than 30% in maths in grade 9 must take maths literacy (this involves what the department of basic education calls "the use of elementary mathematical content" and is not the same as maths) as a matric subject.

Public concern is understandable. South Africans should be deeply worried about the state of maths teaching and learning. The country was placed second last for maths achievement in the latest Trends in International Maths and Science Study.

Research closer to home has shown that pupils, particularly from poorer and under-resourced schools, are under-performing in maths relative to the curriculum outcomes. These deficits compound over time, which makes it increasingly difficult to address learning difficulties in maths in the higher grades.

All of this means pupils may be in maths classes but they are not learning. The answer to this problem does not lie with making pupils repeat an entire grade because of poor mathematical performance.

Grade repetition is practised worldwide despite there being very little evidence for its effectiveness.

In fact, it can be argued that its consequences are mainly negative for repeating pupils. Grade repetition is a predictor of early school leaving.

Pupils who repeat grades and move out of their age cohort become disaffected with school. They disengage from learning and drop out of school.

Repeating a grade lowers motivation towards learning and is seldom associated with improved learning outcomes.

Grade repetition is also an equity issue. The Social Survey-CALS (2010) report found that black children are more likely to repeat grades than their white or Indian peers. This reflects the fracture lines that signal socioeconomic disadvantage in South Africa.

Repetition rates decrease as the education level of the household head increases. Poor access to infrastructural resources, such as piped water and flush toilets, are associated with higher rates of grade repetition. Boys are more likely to repeat than girls. There's also an uncertain link between pupil achievement and grade repetition, particularly for black learners in high schools.

Poor access to infrastructural resources are associated with higher rates of grade repetition

So why does grade repetition persist?

A recent survey of 95 teachers in Johannesburg showed how teachers believe the additional time spent in a repeated year allows pupils to "catch up" and be better prepared for the subsequent grade. This view is reflected in recent reports that teachers are against the new 20% concession that has stirred so much controversy. Their opposition is echoed by callers to talk shows, who assume that repeating subject content results in improved understanding.

But unless the reasons for a pupil's misunderstanding of concepts are identified and addressed, any improvement is unlikely. Given that the deficits in mathematical understanding may stretch back to the foundation phase (grades one to three), it's doubtful that merely repeating a grade in the senior phase is going to be sufficient for remediation. Furthermore, research conducted in South Africa reveals that teachers lack confidence in their ability to teach pupils who experience learning difficulties.

The department of basic education's 20% concession indicates it knows grade repetition won't achieve much.

Poor achievement in mathematics is not going to be solved by making pupils repeat their grade. Repetition effectively makes pupils and their families pay an additional — financial and emotional — cost for the system's failure.

The public outcry should not be that these learners are being given a "free pass" and don't deserve to be promoted. Instead, civil society must hold the government accountable for the crisis in maths teaching. —*theconversation.com*

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