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South African iLukuluku podcast shows we can talk about science in African languages

Significance:

iLukuluku is the name of our African-language science communication podcast that includes curious Zulu-speaking communities in scientific discourse. The podcast entertains and educates Zulu listeners of all ages, by breaking down complex scientific topics using facts, linguistic quirks and humour. We contend that the iLukuluku podcast is a practical, proudly South African example of how ordinary citizens, science communicators, translators, scientists, and black people in particular, can work together to communicate science beyond English.

Ilukuluku is a Zulu word for ‘curiosity’.

It is also now the name of one of Mzansi’s first African-language science communication podcasts that specifically includes curious Zulu-speaking communities in scientific discourse. Each episode is an entertaining, light-hearted dialogue between Zulu-speaking hosts Ntokozo Nomasiko Msomi, a professional language practitioner, and Sibusiso Biyela, a professional bilingual science communicator. Msomi and Biyela worked on several other science translation projects prior to starting their podcast. During this time, they would often have lively debates with one another in a mixture of English and Zulu, in just the same way many other South Africans do. On many occasions, their conversations would boil down to how certain technical or scientific words and concepts, for instance ‘dinosaur’, ‘climate change’ or ‘planet’, just do not exist in Zulu. They would argue about how, or even if, the language could be developed to better express scientific concepts. They recorded some of their debates, and their ‘presenter chemistry’ was palpable to friends and colleagues who listened.

We were thus encouraged to share these often hilarious and gripping conversations with Zulu-speaking listeners from all walks of life. And so the iLukuluku podcast was born, as a collaboration between local science communication non-profit organisation SciBraai (<https://scibraai.co.za/>) and People Of Colour Podcasts (<https://www.pocpods.com/>). The podcast immediately gained media attention in publications like the *Weekend Argus*¹, and began trending the moment it was published on platforms like *Apple iTunes*, *Spotify*, and *Google Podcasts*. From a science communication and translation perspective, we believe that the podcast entertains, educates and includes Zulu listeners of all ages, because it breaks down complex scientific topics by blending facts, linguistic quirks and humour.

But we also believe that this podcast is part of something bigger; something we support with both ‘vigour’ and ‘passion’, the other meanings of *iLukuluku*; and something for which there is strong evidence: by coining new terms to help ordinary folks talk about science in their own African languages, we can begin to undo the distrust of science, and the exclusion from science, that remain entrenched by the legacy of colonisation on the African continent.²⁻⁴ In fact, whether or not a person cares about the relevance of our colonial past, science communication research shows that talking to people about science in their own language does build trust in science.⁴ We therefore believe that translating science in African languages will include more people in the public understanding of science, science discourse and science education, and it can even improve health care.²

In this Invited Commentary, we contend that the iLukuluku podcast is a practical, proudly South African example of how ordinary citizens, science communicators, translators, scientists, and black people in particular, can work together to communicate science beyond English. We also argue that our podcast supports the broader African project of decolonising science and science communication, and so we are calling on potential funders who want to support our work to email us at info@sciencelink.co.za.

Is it even possible to talk about science in indigenous languages?

Yes, it is, because South Africa has done it before. In 1948, Afrikaans became the dominant language of the state after the Afrikaner nationalists secured a majority stake in parliament, which was the culmination of a decades-long effort to develop the Afrikaans language.⁵ This era also ushered in the policy of apartheid, and the Afrikaans language was used to assert dominance of the new white elite over the black majority of the country.⁵ This new dominance of a language that had been considered a ‘kitchen’ language not long before the 1950s, took decades of effort by Afrikaners.⁵ They preserved their language through literary works such as poetry, short story collections, and by developing lexicons. And they did all this with the understanding that language is a crucible of culture and ethnicity.

By the 1970s, the Afrikaner-led government had also long recognised the importance of science and technology in legitimising Afrikaans as a global language. They poured considerable state resources into developing scientific literature and other materials in Afrikaans, and they heavily promoted innovators in Afrikaans, such as Christiaan Barnard, the Afrikaner responsible for the first human heart transplant.³

To us, this is such a powerful example of inclusive science communication. It likely enabled Afrikaans-speakers to join the global scientific discourse, and to talk about science in their own language, in their own communities, and in their own homes. Indeed, the way Afrikaans was promoted in South Africa demonstrates that with the right political will, resources and pride in one’s mother tongue, it is possible to include an indigenous South African language in science communication. Just knowing it can be done is one of the main reasons we started the iLukuluku podcast. And yet, perhaps more importantly, the apartheid government’s Afrikaans language policies also reveal exactly

how enforcing non-native language discourse excluded indigenous languages from scientific discourse. This legacy, left across the African continent by oppressive regimes and colonialism, is why we know we need to continue working on projects like iLukuluku.

Language inclusivity builds public trust in science

The well-researched link between language exclusion and a lack of trust in science, particularly in South Africa, is worth expanding on. We hope a deeper understanding of this key issue will motivate science communicators, funders, academics and language practitioners to pour resources, like training and funding, into making science more accessible in indigenous languages.

By 1976, the apartheid government had decided that the medium of instruction in black schools also had to be Afrikaans. This of course led to the Soweto Uprising of 1976, during which young people had recognised that Afrikaans was a tool of the oppressor. They fought back against an ethnically based language policy that was forced onto the black majority, most of whom had already been subjected to the Bantu Education system that was designed to disadvantage them socio-economically.⁶ Even today, Afrikaans language policies still spark controversy in some elite South African universities that use it (completely legally!) to exclude black students.⁷

In the past, even scientific research itself had been used to exploit indigenous people around the world. Professor Linda Tuhiwai Smith put it best in the opening lines of her *Decolonizing Methodologies*⁸ book:

From the vantage point of the colonized, a position from which I write, and choose to privilege, the term 'research' is inextricably linked to European imperialism and colonialism... The ways in which scientific research is implicated in the worst excesses of colonialism remains a powerful remembered history for many of the world's colonized peoples.⁸

This distrust in science is understandable. Anecdotally, many Zulu speakers use the colloquial saying, *izinto zabelungu*, which means 'things for white people', when referring to science and technology.

Even in our own limited experience as school pupils in public schools in Gauteng and KwaZulu-Natal in the early 2000s, many of our peers feared maths and science, and considered these the most difficult of the subjects. Likely, many South Africans of all ages still relate to this perception today. We suspect that science and maths may be even more intimidating in South Africa than in other parts of the world, partly because these subjects were, and still are, mainly taught in English. This despite English being the second, third or even fourth language of millions in South Africa.⁹

To their credit, the post-apartheid South African government did recognise that the damage of colonialism and apartheid to indigenous languages had to be undone. In 1996, the South African government set out to preserve the heritage of South Africa's rich diversity by introducing policies to develop the country's nine indigenous languages. They intended to develop them all into languages of science too, so that knowledge could be created in those languages.³ Yet today, nearly 30 years later, we still have very little science and maths materials in indigenous languages in schools or in public libraries. So, while the equality of indigenous African languages has been guaranteed by Section 6 of the South African constitution³, in our view it has clearly not been a political priority.

How iLukuluku helps develop Zulu as a language of science

One of the ways in which we want to cultivate Zulu in particular as a language of science, is to discuss science-related topics in a conversational, colloquial way in Zulu.

We felt that a podcast is the perfect platform because it is a popular and accessible digital medium. SciBraai, the non-profit science

communication organisation with which we are affiliated, approached POC Podcasts for help because they too actively create spaces in popular media for voices in Zulu and other indigenous languages. Unlike how science is usually discussed at school or in popular media aimed at Zulu speakers, where a topic is presented as a (boring) lecture primarily in English, or peppered with anglicisms, Msomi and Biyela's goal in each episode is to find or invent the Zulu words for a topic through conversation. And, although they draw on their professional experience and preparations to make informed, factual statements, their lively quips are unscripted. This gives the show a chat-around-the-*braai*-between-friends vibe.

Biyela's main role as co-host is to explain topics, like the Big Bang, how the immune system works and even dreams, in Zulu. Msomi then uses this new knowledge to translate or deduce new Zulu words around the topic. The nature of the Zulu language is that all sounds and words are phonetically consistent, which means that any new term a listener hears will be easy to spell. They would also understand the meaning behind it because Zulu terms tend to be self-explanatory. The listener goes along on the word-search journey, so that they can follow the reasoning behind any new terms that Msomi and Biyela coin. We think this approach also helps Zulu speakers gain an intimate understanding of the science, as compared to merely memorising borrowed English terms.¹⁰



Sibusiso Biyela (left) and Ntokozo Nomasiko Msomi (right), hosts of the iLukuluku podcast (photo credit: Sibusiso Biyela).

Biyela and Msomi also engage listeners on social media by inviting them to agree or disagree with the terms they coin, and listeners can even offer their own translations to enrich the communal lexicon. In the first episode, for example, we asked, "what is 'dinosaur' in Zulu? Is it *idayinaso* or is it *igonqonqo*?". The idea for that episode came from a previous science communication project in which Biyela wrote about a dinosaur fossil discovery in Zulu, but struggled to find the words.¹¹

In several other episodes, we noted clear differences in how certain natural phenomena are understood by English speakers versus Zulu speakers. For example, one listener did not know that the planet known as Venus in English was the same night sky object known as *Ikhwezi* in Zulu.

Table 1 gives an excerpt from Episode 2¹² which was about the Periodic Table of the Elements in which we broke down what an atom is.

In another discussion, we learned for the first time that sulfur, a common term heard in English chemistry classes, already has a name in Zulu: *isibabuli*. Interestingly, many Zulu-speaking learners would say *iSulphur* when talking about chemistry, not making the link to the medicinal yellow powder they were already familiar with outside of the lab, known in their own language as *isibabuli*.

These instances support the idea that there are asymmetries between English and many other African languages, as reflected in the history of colonisation in Africa.¹³ We are hopeful that our podcast can help to better align science discourse in our multilingual society. Our podcast is a 'pilot project' that experiments with the idea of bringing together

Table 1: Excerpt from Episode 2 – Periodic Table of the Elements

Speaker	Zulu	English (translated)
Ntokozi	Yini i- <i>atom</i> ?	What is an <i>atom</i> ?
Sibusiso	Uma ubuka leli tafula, uyakwazi ukulisika libe uhhafu, uphinde ulisike futhi uhhafu, nalowo hhafu kanjalo kanjalo kugcine sekuyizingcucu. Ososayensi bakudala bazibuza ukuthi engakwazi yini ulokhu uqhubekile <i>forever</i> , uthathe into enkulu uyenze into encane. Labo sosayenzi bathi uma ikhona into enjalo, into engakwazi uku- <i>divide</i> -ka uma usufikile kuyona—	Well, take a look at this table here, if you cut it in half, and cut that half in half again, and cut it in half again and so on, you end up with a lot of tiny pieces. Scientists a long time ago asked themselves what would happen if you cut something like this forever, taking large things and turning them into smaller things. Those scientists said that if there is such a thing that would be the smallest thing you could not divide—
Ntokozi	I- <i>atom</i> . Ok, i- <i>atom</i> . Singasho yini ukuthi <i>it is where all things originate</i> ?	That's an <i>atom</i> . Ok, that's an <i>atom</i> . Could we then say that it's where all things originate?
Sibusiso	Singasho kanjalo, <i>that's what we used to think</i> , kodwa akusa sebenzi kanjalo. Abakaze bayithola leyo- <i>atom</i> ababeyifuna, so manje, basebethola ukuthi ayiyodwa i- <i>atom</i> ekhona, kunama- <i>atom</i> amaningi.	Yeah, we could say that, that's what we used to think, but it doesn't work like that anymore. Those scientists never found such an atom they were looking for, so now, they actually found that there isn't just one atom but there are many.
Ntokozi	Kanjani futhi manje? Akukwazi phela!	Wait, how is that possible? That can't be!
Sibusiso	Ingoba phela izinto zenziwe ngezinto eziningi. Izinto ezenza amanzi akuzona izinto ezenza ipulangwe.	This is because things are made up of many other things. Things that make up water are not the same things that make up a plank.
Ntokozi	OK, sengiyakuzwa ukuthi uthini. Bengithi uthi uma ufika phansi kwi- <i>atom</i> uthola ukuthi nawo maningi ama- <i>atom</i> .	Ok, I understand what you're saying. I thought you meant that when you get down to the level of the atom, it is made up of many other atoms.
Sibusiso	Sisazofika kuyo i- <i>atom</i> ngoba ososayensi sebethola ukuthi nayo i- <i>atom</i> iya- <i>divide</i> -ka. Kodwa sizokhuluma nge- <i>quantum physics</i> .	We'll get to that topic on the atom one day as scientists long since discovered that the atom itself still is divisible. But we will later talk about quantum physics.

an experienced English-to-Zulu translator and an experienced science communicator, supported by people who believe that science should engage and include all members of society.

In this Commentary, we have tried to show that South Africans need more words to talk about climate change, black holes, energy, evolution, technology, health and other scientific topics in their mother tongue, and that it is in fact possible to translate science into indigenous languages. In sharing the rationale behind translating science, and how we try to engage people who speak indigenous languages in science, we hope it is clear how much of our 'passion', 'vigour' and 'curiosity' goes into science communication projects like iLukuluku.

If you also care about communicating science beyond English and want to know more, or if you are able to sponsor a season of iLukuluku, please email us at info@sciencelink.co.za.

Competing interests

We have no competing interests to declare.

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