Science and (Un)Certainty: Exploring Science, Knowledge Production, Communication and Uptake in a Post-Truth World
The Academy of Science of South Africa (ASSAf) was inaugurated in May 1996. It was formed in response to the need for an Academy of Science consonant with the dawn of democracy in South Africa: activist in its mission of using science and scholarship for the benefit of society, with a mandate encompassing all scholarly disciplines that use an open-minded and evidence-based approach to build knowledge. ASSAf thus adopted in its name the term ‘science’ in the singular as reflecting a common way of enquiring rather than an aggregation of different disciplines. Its Members are elected on the basis of a combination of two principal criteria, academic excellence and significant contributions to society.

The Parliament of South Africa passed the Academy of Science of South Africa Act (No 67 of 2001), which came into force on 15 May 2002. This made ASSAf the only academy of science in South Africa officially recognised by government and representing the country in the international community of science academies and elsewhere.

This report reflects the proceedings of the 3rd South African Young Academy of Science (SAYAS) Science and Society Symposium – Science and (Un)Certainty: Exploring Science, Knowledge Production, Communication and Uptake in a Post-Truth World held on 8–9 March 2018 at the Nelson Mandela University, Port Elizabeth, South Africa. Views expressed are those of the individuals and not necessarily those of the Academy nor a consensus view of the Academy based on an in-depth evidence-based study.
ACKNOWLEDGEMENTS

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Statement on SAYAS Science and Society Symposia

Science and Society Symposia, as an ongoing project of SAYAS, aim at providing an opportunity for networking among young scientists and with other thinkers and practitioners whose work is inspired by, or rooted in, science. We take a broad understanding of science, to include multiple disciplines including the natural sciences, social sciences, music and the arts.

A/Prof Makondelele Makatu and Prof Philani Moyo
Co-Chairs
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Dr Ngqwala welcomed delegates on behalf of SAYAS and the symposium organising committee.

Conversation and debate has been created around decolonisation in recent years. The theme of this symposium originated from a video of a University of Cape Town (UCT) student arguing that science must fall, which led to a widespread dispute on social media. This alerted SAYAS to the need for scientists, as those who engage with knowledge, to consider the role of higher education, science and its contribution to society and community, what constitutes scientific epistemology and its origin, and the question of inclusion and diversity. This symposium is the ideal forum to engage on these issues. We welcome the keynote speakers, Profs Alex Broadbent and Odora Hoppers, as well as all the presenters and delegates.

Prof Muronga extended a warm welcome to SAYAS and all the delegates to NMU in this year of Nelson Mandela’s centenary celebration.

Science and society invoke thoughts of Nelson Mandela and society and what he stood for in terms of social justice and development. At NMU, questions are asked about what it means to do science and whether the science is done for the benefit of the people and to uplift the poor.
On a recent visit to Nelson Mandela’s birthplace, Mvezo in the Eastern Cape, a delegation from the university was reminded that Nelson Mandela was a man of the people and had come from a village whose inhabitants respected him deeply, and that the university was honoured to be named after him. Young scientists are expected to live the legacy of Mandela in the 21st century.

Hosting this symposium is regarded as a follow-up to a symposium on diversity and inclusion in the sciences that took place during National Science Week in 2017. Topics ranged from the language in the sciences, the role of women and men in shaping science and diversity in terms of Indigenous Knowledge Systems (IKS). It is anticipated that young scientists, such as those participating in this symposium, will become the future science textbook writers. The role of young scientists in this regard should be an outcome of this event.

Opening Remarks
(Prof Alex Broadbent, SAYAS Alumnus, Professor of Philosophy and Executive Dean of the Faculty of Humanities, University of Johannesburg (UJ))

Philosophers are known for being better at asking questions than at answering them. The title of this symposium provoked some questions, namely:

- What is science?
- What is the relation between science and truth?
- What is truth?
- Is truth a good and, in particular, a good that people should be able to access and/or should be forcibly confronted with and/or made to accept, for example by education during the impressionable years of early life?
- Is falsity ever better than or preferable to truth?
- Is there one truth or are there many truths?
- Can we ever be sure that what we believe is true, or one of the truths?
- Should we even bother trying to answer these questions or should we just ignore them and get on with life?

The last of these questions is one that should be answered in the negative, but that conviction can be shaken by attempting to answer any of these questions and discovering how difficult it is. One must always be wary of easy answers and always be sceptical of oneself when one feels certainty. If any of these questions had answers that were not subject to at least some decent objections, they would not be discussed at an event such as this.

As far as philosophers of language are concerned, reference is a closely related notion to truth. Subsequently, as a philosopher of science, Prof Broadbent has spent a considerable part of his professional life thinking about what truth is, what its relation is to science, and how both of these relate to knowledge. In these debates there are basically two positions: realism and relativism. Realists hold that there is one determinate truth, which is independent from what anyone or no-one observes or believes, while relativists deny some aspect of this. Relativists are sometimes motivated by scepticism about their ability to know the truth. If it is defined in a way that makes it totally independent of what they think about it. Realists, on the other hand, tend to be optimistic about their ability to know things even if they are independent of them. Relativists accuse realists of being dogmatists. Realists accuse relativists of being incoherent. This is a concise summary of 2 000 years of Western philosophy.

Both these positions, and many others in between, are reasonable positions to hold about any given area of knowledge. However, it is widely accepted among philosophers that neither position is easy to defend across the board, for all assertions. There are things that nobody would be a realist about. For example, consider whether there is a single, determinate truth about whether tea is a nice drink. Everyone accepts that tastes vary between people and that there is no single truth about at least some matters of taste. Everyone is a relativist about at least some matters of taste.

At the other extreme, there are no serious epistemic relativists who hold that all assertions are matters of opinion. There are good reasons to deny that everything we assert is just a matter of opinion and that all knowledge claims are equally valid. This point is important in the current ‘moment’ in South African higher education, especially the discussions around decolonisation and post-coloniality, and relevant
in a different way in the Global North. More sophisticated and more tenable kinds of relativism generally do not offer what some of the more fervent proponents of decolonisation and Donald Trump alike seem to hope for – a justification for simply rejecting inconvenient truths in favour of alternatives.

When reviewing a UJ policy document on decolonisation, which set epistemic pluralism as a core value of the university, Prof Broadbent was struck by the repeated use of the phrase, ‘epistemic pluralism’. All teaching and research was required to adhere to this value. In addition, both teaching and research were mandated to explore and relate to a plurality of knowledge systems. These proposals were incoherent because a belief in epistemic pluralism means that those who believe that epistemic pluralism is false, according to their knowledge system, must be taken seriously and their ‘knowledge’ not rejected. Moreover, it seems likely that most of the knowledge systems in the world today and historically, do not endorse epistemic pluralism. The idea of epistemic pluralism is very strongly associated with Western thought where it is a fairly recent development. It is not easy to locate a corollary notion in other conceptual traditions and it certainly cannot be assumed that every non-Western knowledge system has the notion of epistemic pluralism and/or would endorse it if presented with it. That is epistemic hegemony of the worst kind. The irony is that by trying to enshrine the value of epistemic pluralism, the draft document appeared to be defeating it.

The way that most serious contemporary relativists approach what they want to say is by asserting that there is truth, but only within or relative to some system. This sort of relativist will insist that there is a fact of the matter about, for example, whether ancestors persist and cause illness. They may accept that there are systems in which a different truth exists, but they will not accept that there is no fact of the matter. The challenge for relativism of this more sophisticated and interesting kind is saying what amounts to a knowledge system in the first place. Someone could just say whatever they wanted with no regard for any kind of constraint, either of logic or reason. Would this be a knowledge system? If so, then what does it mean to say that something is a knowledge system? If criteria for knowledge systems are to be set, it is inevitable that this is done from within one’s own system, and this means that some of that system will inevitably be recreated.

These are difficult questions to resolve in the abstract. Prof Broadbent agrees with Kwame Anthony Appiah both in his approach to these questions and in the reasons he gives for ultimately rejecting epistemic relativism (including pluralism) in the domain of inter-cultural, inter-knowledge-system discourse. Appiah’s approach is coined in the phrase “The Primacy of Practice”. Appiah points out that we much more often agree what to do or think in a particular situation than in the abstract. Appiah’s Primacy of Practice is not meant to prohibit people from ever talking about principles. Rather, it tells them not to start with principles, but rather to resort to this after they have established some areas of agreement about how to proceed in some actual cases. Appiah’s attitude to relativism is first to focus on areas of practical agreement. He holds conversation as a central value because it enables people to arrive at areas of agreement and points out that often the reason relativism is espoused is that it is thought to permit or promote conversation. Dogmatism clearly results in the suppression of debate, discussion, contestation, critical engagement and argument. Relativism should surely permit these things.

Appiah’s insight is that in fact relativism and pluralism do not encourage debate, and moreover that an extreme, unsophisticated relativism is just as damaging for debate as dogmatism. It permits people simply to ignore each other and even to silence each other. There is no reason for people ever to discuss with each other if they each have their truth and do not even disagree, just as there is not if dogmatism is the order of the day. They would just play different games and might even try to stop each other playing the game the other has chosen, if their game mandates them to do so. If there is no disagreement then there may still be physical conflict, but because there is no intellectual disagreement, there is no debate, discussion, contestation, critical engagement, or argument. These things may even be repressed, if, as I feared when I saw the draft charter, they are seen as failures to acknowledge or abide by the idea that there are many truths and all are equally valid. Intellectual debate fundamentally depends upon a rejection of that idea. If you disagree, if you think that I am wrong, consider asking whether my view is as valid as yours. If it is, then you shouldn’t disagree; and if it isn’t, then I’m right. As Appiah puts it, “If we cannot learn from one another what is right to think and feel and do, then conversation between us will be pointless. Relativism of that sort is not a way to encourage conversation; it’s just a reason to fall silent”.

Appiah’s Primacy of Practice is not meant to prohibit knowledge-system discourse. Appiah’s approach is coined in the phrase “The Primacy of Practice”. Appiah points out that we much more often agree what to do or think in a particular situation than in the abstract. Appiah’s Primacy of Practice is not meant to prohibit people from ever talking about principles. Rather, it tells them not to start with principles, but rather to resort to this after they have established some areas of agreement about how to proceed in some actual cases. Appiah’s attitude to relativism is first to focus on areas of practical agreement. He holds conversation as a central value because it enables people to arrive at areas of agreement and points out that often the reason relativism is espoused is that it is thought to permit or promote conversation. Dogmatism clearly results in the suppression of debate, discussion, contestation, critical engagement and argument. Relativism should surely permit these things.
In conclusion, while epistemic relativism, epistemic pluralism and related positions can be respectable intellectual positions, the simplistic and jingoistic versions that go round are not intellectually respectable, just as unthinking dogmatism is not intellectually respectable. Simple assertions that there are many knowledges, many truths, and so forth, can have exactly the same consequences as the dogmatisms they rightly seek to eschew, and they can even become dogmatisms of their own. It is this potential – the potential to close down debate and open the door to dogmatism – that renders ‘alternative facts’ so attractive to President Trump.

Questions

Prof Broadbent was asked what he meant by “relativism allows for agreement in practice without agreement in principle”. He explained that another example might be scientific enquiry itself and that science is based on a number of philosophical, metaphysical ideas. These can be different for different people. In quantum physics, differing views matter, but in the rest of science, they do not matter. Philosophers of science try to make sure that what they say about science is consistent with everything that scientists say when they are doing science. There are many cases where two people can do the same thing for different reasons. Even the idea of starting with principles is a specific thing to the way that European intellectual tradition developed post-1600 (or 1700). The way things worked in Europe before that is that people would reason from cases, the way that legal reasoning (even common law) works.

There is a tendency for PhD students, when exploring a topic to study, to start with a ‘truth’ instead of a question and they do not want to explore this ‘truth’. PhD students and young scientists need to be ‘philosophers’ first, by following a path of deeper thinking, and ‘scientists’ second.

In his new book, Prof Broadbent moved towards a position termed “epistemic humility”. On the one hand there needs to be a commitment that there is truth and on the other hand there has to be humility about whether one has got the truth. One must have a real desire to get to the truth while being constantly critical about one’s own attempts to do so.

Keynote Address: Towards Codes for Cognitive Justice and Rethinking Thinking in Science

(Prof Catherine A Odora Hoppers, Department of Science and Technology (DST)/National Research Foundation (NRF) South African Research Chair in Development Education & Place And Social Capital And Learning (PASCAL) International Observatory, University of South Africa (Unisa), Member of the Academy of Science of South Africa (ASSAf))

Prof Odora Hoppers’ address reflected some of the work done by the DST/NRF South African Research Chairs Initiative (SARChI) Chair in Development Education since 2008.

Prof Odora Hoppers highlighted the following pointers:

- **Wounds and Light:** “The wound is the place where the light enters you. Where there is ruin, there is hope for a treasure. Raise your words, not voice. It is rain that grows flowers, not thunder”. (Rumi, 13th Century)

- **Ethics:** Ethics implies an ‘open’ system without fixed, unalterable, ingrained frames. Norms are frames with rounded corners and laws are frames with sharp corners. Norms and laws divide the world into an ‘inside’ and an ‘outside’ and one can act inside or outside the frames of the law. One can act in accordance with the norm or outside it, or even against it. To be ‘normal’ is a moral concept and not an ethical one. An ethical act can only be born in a moment when the ‘normal’ is forgotten and one goes deeper. One acts according to what the situation demands, from a human point of view, and not from a moral or legal point of view. Ethics transcends the normative and the legal frameworks.

- **Colonialism and Education:** Colonialism is a denial of the reality of the self, favouring an imaginary special position inside the mythology of another’s empire. Education, as it is practised and with all its assessment practices, is actually about dividing those who will succeed from those who will not or cannot.

- **The ‘Other’, Community and Society:** No community is complete without the other. No society is complete in itself. Without the otherness of the other, the self is incomplete and even vulnerable.
• **Knowledge and Society**: What is true of society is true of knowledge. No knowledge is complete in itself. No knowledge is complete without the dreams of the other. Without hospitality, reciprocity, generosity, plurality, no ‘commons’ of knowledge is possible. Scientists theorise about words such as dignity, citizenship, inclusivity and healing but reject these terms when it comes to taking action (Visvanathan, 2016). In looking to the future, it is essential to keep in mind Kuhn’s counsel that, “if stockpiles of unanswered questions heap up at your door, it is time to rethink your paradigm”. A paradigm determines the ‘rules of the game’ and is a socially legitimised way of seeing.

### The Prevailing and Dominating Worldviews

The prevailing and dominating worldviews today, which everyone is compelled to respond to, are narrow in their vision; exclusive and detached in relating to the total environment; analytical and deductive in their perception and thinking; linear in their ‘doing’; hierarchical and competitive in their management of the field of activity.

Prof Odora Hoppers noted that the era of the Empire, weak and strong at the same time, declared Africa and the South to have nothing. Its knowledge systems were irrelevant and its people were unsuited for the ‘modern’ world. Imperial, twisted, parochial mythologies taught people in Africa (for example) that a handful of countries in Europe dominated all thoughts and actions, and naturally set the pattern for the world. They mangled Darwin’s theories of evolution into a populist racist, political narrative of progress and race, and they used them to justify their untold violence on Africa, while the Third World was saying that this was a manifestation of scientific destiny. They intentionally took the lead in everything from table manners and dress codes to economic methods, political philosophy and governmental administration, and notions of civilisational truth and destiny.

Citing John Ralston Saul (1994) asserted that thanks to the phrase, ‘the survival of the fittest’ used by Herbert Spencer in 1864, public debate in Europe became full of scientific truisms that were neither scientific nor true. By 1870, social Darwinism helped shape more empire mythologies than ever before and their combined narratives have ruled Africa up to now. Europeans insisted that their principles were universal. Behind these principles lie the national imperial schools of philosophy around the world that still teach these ‘truths’. The European narrative of history, cuisine, civilisation and fashion spread widely through the violence of colonisation. Educational curricula were filled with these absurdities. Indigenous cultures and peoples were attacked and demeaned by the banning of their languages, cultures, rituals and all things spiritual. Illegal and unethical acts followed. Countless laws, regulations and administrative structures were created and amended in order to install a legal infrastructure and punishment, both social and economic.

### Democracy and Science

In fathoming the depths of what actually happened to those indigenous cultures and peoples, it is necessary to tackle the content of academic offerings (in the case of teaching and learning), paradigms of knowledge production (in the case of research) and the quality of graduates. The agenda for the transformation of the academic systems demands that attention is given to the default drive of the academic system itself. This transformation is seen as distinct from reform and restructuring. ‘A voice is a sound made by a soul’, therefore the Voice of Africa is saying that liberation is not enough. Liberation must be accompanied by emancipation and emancipation is hard work.

In his closing of the United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Conference in Science in 2000, Werner Archer, the then President of the International Council on Science (ICSU), distinguished between the supply side of science, which focuses on practical applications of technology in medicine and food and the philosophical applications of knowledge. Archer emphasised that the latter can bring worldviews up to date and can foster an increased consciousness of a human mission in a complex world. At the same gathering, the then Director-General of UNESCO, Federico Mayor, stated that basic science researchers have to get to grips with issues that they may not have considered as aspects of their work.

He said, “We have to practice democracy at a new level: a level where each party to the science-society relationship is a respected partner, where there is a constant (simultaneous) interaction between the natural and social sciences, where science communication
becomes a two-way exchange between science and society, and between science and politics. There must be a debate so intense, so creative, so rigorous, so intellectually challenging that it comes to be seen as a social, political, and yes, as a scientific Renaissance. One in which universities, academies, research councils and institutes, parliaments, the media and associations for the advancement of science mobilise to link everyone, within and between countries to the knowledge base of humanity. And for this to happen, we need a new commitment at all levels.”

Another voice from the closing of this gathering stated that “Scientists must show by their conduct that it is possible to combine creativity with compassion. The basic human value is life itself. And the most important of human rights is the right to live” (UNESCO World Conference on Science, 2000).

Rethinking Thinking

The idea of balanced relationships, shared ideas, an inclusive circle, diversity, Ubuntu throughout Africa and in the indigenous nations the world over were deemed irrelevant to their use. The challenge that is currently faced by the African people is how to unlearn what was deeply indoctrinated in them and to learn how to see what they have trained themselves not to see. Their journey across a lifespan is a movement towards authenticity, peace and community. The appropriate response to the discovery of “true universality” in education and science in particular is not in the vain attempt to eliminate the other ‘viewpoints’, but the responsible acknowledgement of our viewpoints as partial, not the total truth. The concepts, Africanisation, liberation, decolonisation and emancipation must answer to this imperative.

Samuel Jackson cautioned that, “An injustice anywhere is an injustice everywhere” and Plato said that, “Justice will only exist where those not affected by injustice are filled with the same amount of indignation as those affected by it”.

Questions

In response to a question about how her having cited Europeans in her address fitted in with the message conveyed, Prof Odora Hoppers pointed out that not all Europeans think in a European way.

When asked how ‘ethics’ in the context of plagiarism for self-enrichment and self-glorification makes sense in the intellectual debate, Prof Odora Hoppers responded that ethics as compliance should not be confused with ethics that is lived. Ethics has to be lived.

Elementary Science and Lessons from Society

(Prof Dr Sahal Yacoob, SAYAS Member, UCT)

Dr Yacoob, a particle physicist, would call himself a realist. The belief that there is an underlying truth has been shown to be successful in physics, as evidenced in the technology that pervades modern life. Like the previous speaker he alluded to the famous physicist, Richard Feynman, who used the motto “shut up and calculate”. Particle physics is a narrow technical field based on understanding matter and nature, and one that enjoys a respected place in society. Physicists test things that can be calculated and when their questions cannot be calculated they ask different questions. This is how physics and particle physics have developed over the centuries.

Fundamental physics relates to current topics. From the perspective of Eurocentric education, the knowledge of gravity and what scientists have said about gravity have not always held weight. For a long time in matters of the natural world, there was great disparity in terms of what scientists said, what the church said, and in some matters, this is still the case today. Gravity is one example of the disparity. The church said that God created the earth, that the earth was in the centre of everything and everything goes around the earth in perfect circles. Scientists measured how the planets move and established that they do not orbit the earth in perfect circles. Such differing views persisted for many years. Scientists were labelled heretics for knowledge that is now held as the truth (close to an absolute truth) by all. Fundamental
physics requires an open mind at all times. Open-mindedness has allowed ideas about gravity to change over time. One ‘truth’ can be replaced by a new and better ‘truth’ at any time. However, a different idea of ‘truth’ is not always taken seriously and it is difficult to come up with new ideas if there are no resources to develop those new ideas. Until recently, it has been rich white men who have made the statements about physics. It must be recognised that while there is an ethos of open-mindedness, the entry to presenting an argument has historically not been high, particularly for females and people from the Global South.

All science happens within a society and a context. It is shaped by and shapes the society and the context. As science becomes more and more important in the world and the value of what scientists say increases, so should what they say be representative of global cultures and people. Science has to be inclusive and must be done in a way that makes people feel they are part of the science. Everybody needs to be involved in the pursuit for an objective description of the world. Technology cannot advance in only one geographical region of the world and the benefits of technology advances in one region must be felt globally. Science must become a shared human endeavour.

The post-truth world is one where decisions are made based on emotion, not objectivity. The othering of people hinders the uptake and pervasion of scientific knowledge, and contributes to a post-truth world.

When scientific knowledge is different from people’s everyday experiences, uptake and communication are more difficult and this results in more post-truth decisions being made.

**Humanising Science? Thinking about the Way We Generate, Communicate and Use Knowledge**

(Prof Jo Vearey, SAYAS Member, University of the Witwatersrand (Wits))

Prof Vearey’s work at the African Centre for Migration and Society (ACMS) looks at questions around the generation of knowledge, what knowledge is, the idea of communication, evidence informing policy and evidence-based policy, and frustrations of what it means to be involved in research. Some questions (such as those around the idea of knowledge, knowledge politics and the dual imperative, whether knowledge generation simply means curating someone’s knowledge, what data is and who owns data) do not have answers, but must continue to be asked and engaged on. The ethics of knowledge and of data ought to be thought through more.

Key guiding areas for ACMS’s work are around ethics and methods and the politics of knowledge production, and much of the work is informed by a feminist approach linked to the idea of decolonising and democratising methods. It is important to acknowledge the decades of work that exist around the idea of decolonising methods and to engage and articulate all of this work which should inform much of the work being done currently around decolonising and democratising science. Indigenous scholars across the globe have produced much work around the complexities of the search for knowledge, questioning truth and re-representing the narratives of others.

All the work produced within the ACMS projects is created under a creative commons open access model, is available online and can be downloaded. Some of the work is published in print form. Some of the ways that academic work should be brought into conversation with other forms of engaged research requires the development of different skills and better relationships and partnerships with organisations that help researchers translate their work.

In the introduction to her book, *Decolonising Methodologies*, Linda Tuhiwai Smith reminds readers of the challenges of research (natural and social sciences), what it means to think about the memories of how research was previously done ‘on’ and not ‘with’. Whilst this has absolute relevance in terms of forms of colonial power, it must also be recognised what it has meant in terms of problems within countries and contexts that were themselves the colonisers. There are ways in which the power dynamics of research can create trauma and have histories of trauma in multiple contexts.

ACMS’s work is premised on recognising the danger of the single story. Chimamanda Ngozi Adichie’s talk, The Danger of a Single Story, highlights what it means to tell the story of others and position one’s self in those stories. Discussions on #ChimamandaGate address what ‘post-colonial’ means and the ways in which her work has been
engaged in and developing theory around the post-colonial, but how in a public space and a different context there is denial of post-colonial as a discipline or an approach and a suggestion that it is something that academics create. It is important to read some of the discussions, much of which come from South African scholars, around the challenge of what it means to acknowledge the need to represent multiple narratives. The *Danger of a Single Story* gives researchers the power to produce people as one thing and individuals, groups or geographic spaces become one narrative. It is necessary to think about the power that is inherent in this and the way it can be made a definitive story. True believers in the importance of social research are implicitly individuals who believe that there is more than one noble truth. This guides their work and affects the way they engage with their research findings on a continual basis. On the one hand, they argue for the need to better understand the world from multiple perspectives, and only give one version of the story.

ACMS has worked with many groups, particularly migrant and mobile populations, in partnership with sex work advocacy and movements in South Africa, and with lesbian, gay, bisexual, transgender and queer (LGBTQ) migrants and residents in informal settlements. Part of the work is about exploring whether there are ways to better involve and work with individuals so that their stories can be shared in their words and they can represent their histories themselves. There is substantial literature around the challenges and tensions concerning this. ACMS does not call its work ‘participatory’ and does not think that participatory research is achievable, but does believe that there are ways to involve and engage, humanise and be more respectful in the ways that it conducts its research. Social justice should be inherent in research practice.

ACMS’s programme known as MoVE (Method, Visual, Explore), is a way of challenging concepts around methods and ethics. Different approaches have been used to work with different individuals to better understand experience and within the context of multi-methods research. Drivers of this work include:

- The complexity of the context worked in and what this means in terms of justice and the responsibility of researchers when working in spaces of extreme inequity.
- The approaches to research. It is argued that issues of power and reflexivity are inherent in any disciplinary approach to science and knowledge and not only invoked in social research.
- Ethics and the need to think about ethics in multiple ways. There are different questions around ethics that would be asked around the way that knowledge is being used, not only in its so-called production. This would link to questions around natural and hard sciences, and bench-based science, about the ethics of who has ownership of the data, where early career scholars stand in this, what happens when there are ‘ghost papers’ and when there is an obligation to give ‘guest authorship’ to others who are not involved in the research.

It is necessary to consider how these issues come together and how ways to work together in potential collaborations and partnerships in ways that try to include and through the process are advocating for different conversations around justice.

The idea of multi-method research is important. Projects do not happen in isolation, but work to generate different materials that can be used by different constituencies including advocacy partners, government officials, academics and researchers. When the more traditional and less traditional research approaches are put together there is a much more productive, constructive and problematised conversation.

**Are We Asking the Right Questions?**  
(Dr Marnie Potgieter, SAYAS Member, University of Pretoria (UP))

Questions are instrumental in acquiring knowledge. They are necessary in order to learn about various aspects in life and underline the greatest mysteries in science, and have been widely used in the political arena to keep people accountable. Many of the great mysteries remain unresolved in science. Asking the right questions has the potential to change the world.

Thomas Berger stated that, “The art and science of asking questions is the source of all knowledge”. However, Joseph Lister, a famous British surgeon, said that, “While all the facts lay equally clear, only those which conform to existing theories, seem to arouse our attention...".
This is a problem, yet the same attitude is seen in the questions asked about the cause of Alzheimer’s disease (AD). This disease was reported by Alois Alzheimer more than 110 years ago.

The Amyloid hypothesis, the Tau hypothesis, the genetic disorder hypothesis and the pathogen hypothesis followed, and then in 1998, Brian J Balin was able to show that Chlamydia Pneumonia (respiratory bacteria) was present on the brains of AD patients. This was rejected because AD patients do not present with symptoms of infection. Dr Potgieter’s research focuses on investigating and characterising the microbes in the blood and has found bacteria in blood samples from AD patients, but faces a similar enigma to that of Dr Balin’s research.

How is it possible that the world’s many great minds have been able to unravel the underlying mechanisms of AD? The right questions are not being asked, but how should they be asked? In 2009, the motivational speaker and business analyst and strategist, Simon Sinek, invented the ‘golden circle’ (comprising three circles of ‘Why, How and What’ within the circle). He found that the difference between companies that are really successful and leaders in the field, and those that are less successful is how they use the golden circle. Companies that are less successful first ask questions about what the product is, how it should be used and why it should be bought. The ‘golden circle’ overlaps with the ‘golden ratio’, which is the mathematical depiction of what is known as ‘divine proportion’ occurring in nature and used in art and architecture.

If a question starts from a place of integrity and is formulated creatively, what is asked will be able to produce an answer that will maximise future freedom of action and keep options open. Questions can change the world.

**Discussion and Q&A**

Panellists were asked whether there is a way to produce knowledge that takes both the realist and relativist positions into account, and whether there are certain truths that define multiple perspectives and if so, what they are. A further question was around whether the challenge of applying science to society relates to interest or to the channels used to communicate research within the science space.

Prof Vearey was initially trained as a positivist as an undergraduate student studying genetics. Knowledge is a continuously evolving space. New insights and new knowledge keep emerging and this pushes scientists to ask new questions and develop new hypotheses. The answer to the question about whether there is a third paradigm can be found in Prof Broadbent’s input around pluralism in epistemologies and so forth. Different positions can be brought together and it is important to be able to grapple across different spaces. Such training does not exist for postgraduates. It is necessary to be better at thinking through what is flippantly called ‘reflexivity’ and recognise that researchers are much more embedded in the processes. What science is or is not does not get communicated.

Dr Yacoob pointed out that science is often incorrectly thought of as a body of knowledge. It is better to think of science as an approach to finding knowledge. Any scientific statement is given within the limits of observation and can be overturned by new insights. There is not an absolute truth in all cases, but there is value in searching for that which works in a physical situation. In a well-defined space there is a right answer to a particular question and in that sense, it is the truth. It is always important to keep that information in its context and avoid over-analysis and interpretation. Science happens within a society and must be used for society’s needs.

Dr Potgieter mentioned that cross-disciplinary collaboration works well in her field. When two disciplines are brought together and people ask each other questions about their fields and design a project in the middle of those two fields, not only do coherent questions come from there, but the two bodies are able to assess each other’s questions and make sure the questions are as powerful as possible in order to give the most powerful answers possible at the time. However, this is not always easy in South Africa because of various reasons. A collaborative project needs to be in line with the focus area. It might be necessary to pay more attention to and invest in bringing different fields together so as to encourage creativity and ensure accountability for the outcome and the truths produced in the research.
Retracing Knowledge Production and Ways of Thinking for a 21st Century — Whose Knowledge?
(Facilitator: Prof Kanshukan Rajaratnam, SAYAS Member, UCT)

Archie Mafeje and the Idea of Non-disciplinarity
(Mr Bongani Nyoka, Unisa)

Part of what is meant by decolonising the university has to do with tapping into the African knowledge archive or scholarship. In tapping into the African knowledge archive, Dr Nyoka discussed the most serious features of Archie Mafeje’s work in his paper titled, Archie Mafeje and the Idea of Non-disciplinarity, focusing on Mafeje’s programmatic work, which is the critique of the social sciences proper. A claim usually made is that Mafeje single-handedly demolished the discipline of anthropology but such a reading on Mafeje’s work is misleading and the idea is factually and historically incorrect. To suggest that Mafeje offered a critique of anthropology only turns him into a reformist (instead of the revolutionary scholar that he was) and ignores the fact that he critiqued all of the social sciences. He understood, where other social scientists did not, that all of the social sciences are Eurocentric and imperialist. The focus on anthropology to the exclusion of other disciplines is to make reforms instead of adopting what he calls “a thorough and radical critique for the emergence of non-disciplinarity”.

In one of his earlier essays, Mafeje reminded radical social scientists of the importance of the sociology of knowledge in shaping one’s ideas. He argued that in singling out anthropology as the problem, its critics became undialectical and thus created an epistemological impasse. This is so because they identify the problem but fail to link it to the metropolitan bourgeois social sciences, which are equally functionalist and imperialist. The focus on anthropology to the exclusion of other disciplines is to make reforms instead of adopting what he calls “a thorough and radical critique for the emergence of non-disciplinarity”.

For Mafeje, anthropology was in the colonies what other social sciences were in the metropole. As such, to single out anthropology from other social sciences was a form of mystification. It is against this background that one is able to criticise anthropology without turning it into the black sheep of the social sciences. Anthropology was the first to arrive in the colonies because the bourgeois metropole needed it in order to conquer the natives about whom they were least informed. That anthropology coincided with colonialism is not surprising since it had to provide knowledge and access to unknown societies. To fixate on anthropology is to engage in petty reformism that does not take history and the totalising critique that Mafeje speaks about seriously. Mafeje therefore advocates a holistic approach that transcends all disciplines. In his work, he argues that such an alternative was to be found in Marxism because Marxism transcends disciplines. Equally, Marxism cannot be interdisciplinary without being self-contradictory. Thus, Mafeje argued that Marxism is the best anthropology because it is non-disciplinary.

Although Mafeje championed Marxism, he was prepared to subject it to critical scrutiny. Later on, he modified his position and no longer advocated Marxism but continued to advocate for what he called ‘non-disciplinarity’ from an African perspective.

The University and Bad Dreams
(Dr Joel Modiri, UP)

The aim of Dr Modiri’s talk is to think through two central terms that signify the current university experience in South Africa and perhaps globally. The first is ‘neoliberalism’ or ‘corporatisation’ and the other is ‘decolonisation’. Dr Modiri suggested that these two terms are working in opposition to each other. If one pressing question is how to decolonise a university in a still colonised society, the other important question is how to decolonise a neoliberal university. One of the things that makes any kind of sustainable decolonisation or decolonising of knowledge and the university is the fact that the university is governed by a neoliberal order.

Through these terms (‘neoliberalism’ or ‘corporatisation’ and ‘decolonisation’), rapid and disturbing changes are taking place in the culture of intellectual and social life in the university. One of the obvious scenes of this problem is the crisis in the arts and humanities and the rise of a structural bias in favour of the so-called STEM subjects (science, technology, engineering and mathematics) and the belief that society requires science and technology more than it requires the arts and humanities. Another is the pressure for universities to provide
an instrumental, skills-based technical vocational training in contrast to a broad and deep education in the disciplines. Dr Modiri made the argument that it is necessary to apprehend the meaning of the two concepts for the cultures of knowledge production, scholarship and academic discourse that are produced and to trace the fundamental contradiction between them. He raised some points about why decolonising the university requires a fundamental overhaul in its current neoliberal practices and structures.

Beyond Colonial Science: Rethinking Knowledge Production for and about Africa in the 21st Century
(Prof Enocent Msindo, Rhodes University)

Africa has a very rich and diverse history of science and technology that developed together with increasing state political complexity long before the Middle Ages. Prof Msindo argued that there is evidence that dates back to the classical times of complex state systems that had divisions of labour, which allowed for the growth of science and the more practical technologies involved with the engineering of public works. He cited examples of engineering and the built environment, water management and technology in ancient times, as well as other pre-colonial scientific ventures such as complex sun-dried clay and dry-stone walling, significant metallurgical and black-smith technologies as well as sophisticated artisanal gold mines, salt panning and extraction technologies. Many centuries ago, Africa developed knowledge of biology and botany and the ability to produce sophisticated weaving to make cloth. Long distance trade networks existed in almost all parts of Africa.

The science that was developed at that time was relevant, sustainable and indigenous. It was about creating global and local solutions primarily using local, predominantly organic resources. In pre-colonial Africa, science in Africa spoke to African cultures, belief systems and political practices. It was relevant, yet it also embraced foreign inventions and was therefore also partly hybrid. The slave trade significantly disrupted centuries of good work that had advanced African societies scientifically and economically. The Africa that got colonised was on a very good developmental path with strong emerging domestic markets for products, as well as international markets for African scientific inventions. African local scientific knowledge systems were based on understandings of sustainability and the human and natural environment as a system.

Colonial science refused to speak to African conventional science, which it believed to be associated with taboos and superstition. Western scientific models were regarded as normative. The Western school model was the chief instrument of colonialism and an arena for systematic brainwashing, knowledge alienation, reorienting values to ensure that shared knowledge in African communities was delegitimised. The educated elite (a generation of youngsters who were educated in the Western schooling system) adopted colonial science at the expense of indigenous sciences, while local science ought to have been integrated into the global and Western science without delegitimising the other and hybridity created. The early educated elites were trained in the skills that qualified them to serve as technicians and assistants to predominantly white engineers and scientists, but they were not equipped scientifically, even in terms of colonial science.

Knowledge theft from generations of indigenous botanists resulted in substantial financial losses and the deprivation of African languages in botanical discourse contributed to the inaccessibility of colonial science and the loss of knowledge transfer. In post-independent Africa, new governments were torn between modernisation impulses on the basis of Western supported science and promoting IKS.

The following steps should be taken towards producing knowledge for and about Africa:

- Science should be integrated into social and belief systems for purposes of simplifying it and making it a lived reality.
- The strength to reposition Africa globally as a relevant player needs to be tapped into (such as in the fields of biomedicine, environmental conservation, housing architecture and climatic knowledge) by patenting African indigenous knowledge, not necessarily to individuals but to communities or groups of inventors. Patent and designs legislation has to be amended to take Africa beyond the limits of Western capitalist models of copyright.
• Embedded African scientific knowledge needs to speak to the science that happens in universities.

• More government investment into relevant scientific research is needed. Most of the science that is done in the universities in South Africa is unproductive and fails to speak to African interests. Africa’s most acclaimed scientists have no products, no patents, no designs; but they graduate many PhD students and publish many journal articles.

Discussion and Q&A

Capitalism and Decolonisation

Dr Modiri was asked to give his thoughts about ways to respond to the challenges currently faced with regard to the corporatisation of universities that impacts academic publishing and copyright. He indicated that part of the solution to this issue lies outside of the university and suggested that academics should organise themselves and their work in ways that reclaim a critical idea of the university. This means that they need to re-evaluate their own desires for professional advancement in the university and their own understandings of excellence. Second, academics need to address the public and the youth (students) to understand the value of an educated public for a democracy and for a more radical future. Linked to post-truth is the connection between ignorance and the destruction of a society. Neoliberalism is producing a world ruled by technical expertise and simultaneously a world with high levels of social and historical ignorance. Academics need to show the value of education for a democracy or for any kind of society. Third, intellectual activity needs to be moved outside of the university and into communities, most essentially, into building public literacy in black communities. The charity-orientated approach to black communities should be replaced by a notion of critical literacy in communities, not allowing black communities to be wasted away by social pathologies. Community universities need to be built.

Dr Modiri was asked how neoliberalism could be linked to arrested decolonisation and how it could be dealt with. He responded that neoliberalism seems to harbour a colonising economic as well as cultural logic. It shares with colonisation the commodification of things that were once not commodities and is historically linked to global development discourses and the remodelling of the Global South through capitalism. The ways in which neoliberal universities are embracing decolonisation demands critical vigilance. Many universities are re-branding themselves as undergoing decolonisation while still committed to the NRF-ratings, international rankings, Euro-American theoretical paradigms and so forth. There is a way in which decolonisation, as something that is fundamentally unsettling, has been settled into the neoliberal logic of the university and is seen as yet another source of income. This needs to be resisted. Forms of decolonisation have been completely captured by neoliberalism and need to be countered by a radical intellectual politics.

Indigenous Knowledge Systems and Globalisation

Prof Msimbo was asked to give his view on the usefulness of the term ‘IKS’, which can be seen as insular, projecting an Africa that has never talked to the rest of the world, and how it relates to the inter-penetration that has taken place between African knowledge systems or cultures and other cultures that predate colonialism over the years. Prof Msimbo was of the view that there is no better word for ‘IKS’ at the moment and unsure whether ‘indigenous’ (a neutral term) always presupposes colonialism. It is important to distinguish Western knowledge systems from locally based system and IKS. Words such as ‘traditional’ should be avoided. He does not view Africa as insular and argued that there is evidence of exchanges between Africans and communities elsewhere in the world over many centuries. These interactions did not mean that Africa lost everything. Some products remained African because of the uniqueness of the geography and the environment from which specific products emerged and continue to be used.

Prof Msimbo stated that capitalism is about individualism. He proposed that knowledge from Africa and its products need to be patented. Indigenous knowledge is never developed by a single individual, but is developed over time by communities that share the knowledge, which is used as a base for the community by the community. There is a need to redesign the intellectual property legislation to incorporate forms of recognising knowledge that has come from communities and
may need to be patented by those communities. He noted that for example, this discussion should take into consideration that within IKS, (traditional) medicine which is used in a sustainable manner does not disturb natural processes and is not for profit, unlike pharmaceuticals.

Dr Gibbs’s involvement as Regional Director of the Eskom Expo for Young Scientists is part of a community engagement project run by and made up of volunteers, which envisions taking science to all the schools in the Port Elizabeth/Uitenhage area. The Eskom Expo for Young Scientists is a non-profit organisation that is run nationally by volunteers throughout the country with the assistance of the national and provincial departments of education and the national DST. Its main vision is to inspire young scientists and researchers in 24 categories of science. Learners from grade 3 to grade 12 are encouraged to address application-based science. About 7 000 learners take part in the national expo. Learners are paired with an expert (mentor) from industry or a university.

Dr Gibbs introduced the young scientists who were selected to be part of the International Science Fair who presented their award-winning projects.

Miss Allison Derricks, Collegiate Girls High School

In 2017, Miss Derricks won a gold medal at the regional science expo, as well as the national science expo, where her project was selected the best in chemistry and biochemistry. She was selected to the South African team of young scientists who will participate in the International Science Fair. She presented her project titled, Increasing the Fire Retardency of Regular Household Paint.

Master Daniel Holmes, Grey High School

Mr Holmes’s project involved building a simple salt water battery that could power light-emitting diode (LED) bulbs and offers a safe, easy and affordable alternative to open flames and illegal (electrical) connections as a means to prevent shack fires. The primary objective of the project was to enable shack dwellers to have sufficient light to read by at night. He has participated in the International Science Fair twice and was selected to travel to Zambia to display his project.

Master Junaid Kynoch, Sanctor High School

Mr Kynoch’s project addressed the design of various vehicles to prevent them being blown over by strong winds. He was awarded first position in the category Innovation and Technology, best engineering project and a silver medal at the regional science expo, and presented his project at the International Science Fair where he was awarded the bronze medal. He was also awarded first position in the district science expo.

Theme 3B: Facilitating Critical Thinking among High School Learners

(Facilitator: Mr Robert Inglis, Jive Media)

Mr Inglis runs a multi-media company called Jive Media Africa. Jive Media Africa produces media strategies and products that challenge and inform, making a difference in the areas of science and technology, biodiversity conservation, health and human rights. Jive Media’s engagement with SAYAS has been around a project that it runs called Science Spaza. Through his work as a science communicator, he has worked with scientists in South Africa over the last 15 years to help them reach public audiences with their science. One of these public audiences is the learners in schools around South Africa.

1 Access website on: http://www.exposcience.co.za/

2 Access website: http://jivemedia.co.za/
Africa as they as the next generation of scientists. There are numerous barriers to communicating science, especially between researchers and young people. This became the basis for the Science Spaza project.

Currently, about 150 science clubs in schools around the country have shown interest in receiving information in the form of the Science Spaza newsletter, which includes a number of activities and is distributed quarterly. The project tries to create a linkage between science institutions and a growing network of science clubs. Delegates were invited to support the project by promoting the initiatives and getting more science clubs established and being involved in the clubs. Jive Media would facilitate the linkages in order to create better engagement between researchers and the public.

Mr Inglis was busy with a study to look at the experiences of speaking at schools and the level of interaction, and would invite SAYAS to support this project. It was of crucial importance for young people to get involved in the science conversations in order for science to be seen not only as a simple activity by a group of people but as a process of generating knowledge within society.

Learners from Lingisa High School attending the symposium were invited to comment on how they see science and science as a vehicle for creating a new future, and the challenges that prevent them from participating in that vision.

Feminist Knowledges: Moving within Margins and Across Boundaries (Dr Nadia Sanger, Department of English, Stellenbosch University (SU))

Dr Sanger presented from her paper that is a work in progress and asks whether feminist voices and feminism as advocacy and theory and the gender agenda within have made any impact in South African society. Her view is that feminist activism in the form of social movements and intellectual activism in the academy in South Africa has made some significant strides. For example, there is a visible presence of concerns about gender and race as seen in the recent student resistances in higher education. Social movements, particularly those in the form of internet activism, have demonstrated resistance to patriarchy, violence and the sexual abuse of women, through campaigns. At some universities, collectives such as the Black Academic Caucus hold the university accountable for transformation and for prioritising black academics’ knowledge, and this includes the appointments and promotions of black (women) faculty. The fact that these concerns are being spoken about is significant and suggests that the context is shifting and that there is some space for resistance to dominant paradigms.

Intersectional theory has become the frame from which feminists (academic and activist) talk and think about gender. It is the epistemological premise for prioritising black women’s positionalities and experiences of oppression, and white South African’s experiences of privilege. Simi Afonja spoke about the importance of African feminism to critique itself with the aim of avoiding a certain kind of
exclusive African feminist discourse that separates itself from non-feminist women, women working at the grassroots level and political work by men and women shifting neoliberal paradigms. In this vein, Dr Sanger discussed the possible dangers of certain current feminist thinking framed within theories of intersectionality and identity politics. She suggested that the notion of intersectionality and identity politics, although useful, must be thought through a bit more carefully than is contemporarily the case.

Dr Sanger looked at a potentially more useful way to think and talk about gender, race, class, sexuality, about identities and how they matter and how to produce feminist knowledge that considers “that we are a bit more than just suffering subjects”, as Achille Mbembe says. She suggested that it is the strides feminists have made over many decades and the work they have managed to do that are being undermined in favour of a depraved discourse about gender and race.

Dr Sanger expressed discomfort about the discourse about black boys and men, and their supposed worthlessness, and about the certain strand of feminist ideology and the language that is being created. Dr Sanger used the ‘#menaretrash’ movement, which emerged in 2016 in South Africa, as a means into this discussion, pointing out that the problem is with the way in which this discourse has evolved. Feminist work should be built on critical knowledge and practice that while gender is about power and relationality, it is unproductive to minimise its complexity; to simplify gender to fixed binaries. Currently, the language used to talk about gender, race and class lacks the complexity needed in order to move us towards less limiting modes of being in the world.

**Harvesting Women’s Knowledge for Alternative Future**

(Dr Edith Phaswana, Thabo Mbeki African Leadership Institute (TMALI), Unisa)

There is no doubt that the early writers on decolonisation in Africa had to grapple with multiple matrices of colonial power at the physical, social, economic, political and epistemic level. While there have been many articulations of what decolonisation really is from diverse voices and efforts globally, many African voices on this topic have not been heard within the world of research, publication, teaching and learning. It is for this reason that African universities over the past 65 years of national sovereignty have not been able to offer a fully decolonised curriculum. At the turn of the 21st century, forceful and violent forms of protest to decolonise knowledge were witnessed on the continent and in the West. The university remains a visible global power structure that privileges Western ways of knowing over others. The worldwide struggle for Africanisation and decolonisation of knowledge by students in the UK, Canada, the US and South Africa is a struggle for dignity and the restoration of the humanity of people from the non-Western world. Science, with all its good intentions, has been complicit in the process of the dehumanisation of Africans. Africans still contend with the effects of scientific knowledge that questioned their humanity, or what scholars such as McDonald-Torres (2007) call misanthropic scepticism. There is no doubt that the foundations of knowledge in the Social Science and Humanities are essentially ‘racist’ and ‘sexist’ as Grosfuguel (2016) argues.

While millions of Africans throughout the liberation struggle imagined independence in a new and different way, African women dreamt of a far more ‘new way’ that is de-patriarchalised, decolonised, deracialised and de-Westernised – to use Ndlovu-Gatsheni’s (2017) concepts. This scholar emphasises that the intersection between decolonisation as ‘a process of complete transformation of the world and its systems’ in order to enable the emergence of the world for all and feminism as a struggle for the emancipation of women for multiple layers of oppression that condemn women to subordinated positions and disposable lives is an important part of conversations about a just, free and fair future. An alternative feminism must seek to go beyond the parameters set by orthodox, liberal and conservative feminism, by exploring the multiple and intersecting systems of oppression, domination and hierarchies that determine the women of the South and the women located in the underbelly of modernity and coloniality. Black people, women in particular, are silenced within this underbelly. It was clear from the onset that African women were at the far receiving end of colonialism and patriarchy. It could not be assumed that colonialism affected men and women equally. The women’s knowledge that exists is vast and should encourage the new bright, breed of scientists to begin to grapple with questions in this regard.
South Africa is increasingly positioning itself as a knowledge-based economy and it is necessary to think about what this means for women. Historically, women’s knowledge was not communicated, and the majority of people still think that feminism as an ideology should be studied by women and occupy a lower status in the academy. Men are impressed by a woman who calls herself a Marxist, because that woman is seen to be entering a man’s world. The idea of a knowledge economy has been hailed as the end of patriarchy and the transformation of family life. The evidence of increased gender inequality suggests that government interventions have made little impact in this regard. Since women have been becoming more successful than men in terms of levels of education, they might be expected to do well in the knowledge economy and society. However, evidence from elsewhere tells a different story as Sylvia Walby’s paper shows. The knowledge economy and society privilege those with greater amounts of human capital. Women’s human capital remains devalued and even less value is placed on women’s knowledge. The skills and qualifications that women possess are still treated as being of little value in the knowledge economy. The new breed of scientists should grapple with these issues and question the implication of this perspective, and speak truthfully about the situation of women in general and African women in particular. They must be able to analyse forms of erasure, muting and subordination that women experience as knowledge producers and project possible futures that could emerge.

The Intersectionality of African Feminisms in the Production of the Knowledge Economy
(Dr Naomi Nkealah, SAYAS Member, Wits)

Dr Nkealah’s paper looks at the whole idea of knowledge production in the field of feminism, particularly from an African perspective, and problematised the framework around knowledge production. She asks two critical questions: Who produces knowledge, and from where? Dr Nkealah presented one of her case studies, which focuses on the widely publicised speech, Gender Equality Celebrity Feminism, Privilege, and the United Nations HeForShe Movement, delivered to the United Nations (UN) in 2014 by Emma Watson, the then UN Women Goodwill Ambassador. The gist of the speech is captured in a brief summary by Dr Nicki Lisa Cole, which stated that it was ‘a smart, important, and moving speech about gender inequality and how to fight it. In doing so, she launched the ‘HeForShe’ initiative, which aims to get men and boys to join the feminist fight for gender equality. In the speech, Watson made the important point that in order for gender equality to be achieved, harmful and destructive stereotypes of masculinity and behavioural expectations for boys and men have got to change.

Towards the end of the speech, Ms Watson made reference to certain statistics about Africa: high levels of illiteracy among girls and young girls being forced into marriage. The speech was made just months after the kidnapping of about 276 school girls in Nigeria, which was claimed by Boko Haram. Therefore, the issue of young girls being made to play wives to adult men had been made notoriously an African problem. Ms Watson used the statistics to provide a rationale for why the ‘HeForShe’ movement was important for the world. Some hailed her speech as being a game-changer, bringing new innovation to feminism and taking feminism to new heights. Ideas presented by Ms Watson had been put forward by African feminists since the 1980s, but were seen as new knowledge simply because it was presented from a particular (Western) platform. The African owners of the knowledge had been made to disappear.

Dr Nkealah was of the view that Watsons’ approach was problematic because new knowledge cannot be produced without making reference to existing knowledge. Watson failed to take cognisance of the huge body of knowledge on feminism produced by African knowledge producers. African feminisms produce new knowledge by speaking against each other, but at the same time, speak for each other. They build on existing knowledge. The different forms of African feminisms all speak of gender inclusion. Two things are hugely problematic in terms of how knowledge production has been framed in the current feminist world of theorising feminism, namely:

- Location determines who produces new knowledge.
- Positionality determines who produces new knowledge.

Discussion and Q&A

The following comments were made in relation to the talks in this session:
• When seen from a certain perspective, men created the problems for women and were placing the burden of the solution back onto women, once again labouring intellectualisation. Men should be part of the solution to the gender imbalance.

• The idea of feminism being constructed by men, men positioning women around feminist issues and women standing up to men has been spoken of instead of the view of co-constructing feminism. Women very often construct other women in social positions.

• When talking about feminism it is essential to take culture into account (not only African culture).

In response to a question about how studies in feminism in the humanities speak to knowledge generation in the natural sciences, Dr Phaswana indicated that the same question could be asked of other ideologies, such as Marxism, and that there are already a number of scholars in the natural sciences who are feminists and are doing feminist work.

A point was made that Emma Watson is an actress and not an academic and probably does not read feminist literature. She has pulling power and was able to open the conversation for feminists. Her speech is different and appeals to people in the street. The term, ‘HeForShe’ is simple and can be easily understood. All knowledge is somehow connected. It is perhaps important to consider what South American or Asian feminism (for example) has to say and how this conversation can embrace all women.

Dr Nkealah refuted the point that Emma Watson is not an academic because she claims in her speech that she had done recent research to come up with her arguments. If this was so, she ought to have known what is happening in the field and be up to date on the information. A careful analysis of the speech shows that she follows an academic approach to putting her point across, but the problem is that she sidesteps the literature review process to the extent that she claims research done by African women to be her own. This is ethically problematic.

Further points raised in relation to Dr Nkealah’s talk were:

• It is important that any person who creates knowledge, whether African or not, is given a platform and is known so that people are not sidestepped, as has been the case. The origin of knowledge is important and giving knowledge credence and reference does not mean that it cannot be shared. The idea of qualifying information is problematic for IKS. Information has existed for centuries but because of the systems and ways in which information is disbursed it does not qualify as valid, scientific or true.

• It is important to centre Africa in the generation and dissemination of knowledge. The first step before talking to the West is to talk to Africa and Africans using the tools that are relevant to the kind of knowledge Africa possesses. Knowledge is being constructed around Emma Watson and scholarship is created around her. It is important for Africa to empower itself first and then the West will want to talk to it.

In the context of Dr Sanger’s note on the emphasis on ‘black bodies’ (black people being seen as objects and not subjects) in her talk, she was asked how one can move away from the victim posture (of colonisation) in order to create new languages of science and academia, for example. Dr Sanger explained that the use of the term ‘black bodies’ is uncomfortable, lacks intellectual depth, and needs to be contextualised. The paper she is working on addressed this issue and tries to move away from the victim posture.

Wrap Up of Day 1
(Prof Philani Moyo, SAYAS Co-Chair, University of Fort Hare (UFH))

Prof Moyo closed the day’s proceedings and introduced the ethnomusical\textsuperscript{3} performer, Ms Bongiwe Lusizi (Stage name ‘Mthwakazi’) and her group who gave a performance.

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\textsuperscript{3} Ethnomusicology is the discipline most concerned with the study of music in culture … concerned with the study of mankind. Merriam A. ‘Ethnomusicology Discussion and Definition of the Field’, Ethnomusicology, Vol. 4, No. 3 (Sep., 1960), pp. 107-114. Ethnomusicology is the study of music from the cultural and social aspects of the people who make it. It encompasses distinct theoretical and methodical approaches that emphasise cultural, social, material, cognitive, biological, and other dimensions or contexts of musical behaviour, instead of only its isolated sound component [Wikipedia].
Building Powerful Knowledge Together — Bringing Science into an Ecology of Knowledges in Response to Contextual Risk
(Ms Priya Vallabh, Rhodes University)

Ms Vallabh shared some insights from a PhD study that looked at more than 60 citizen science projects in South Africa. Citizen science describes a range of things and generally refers to volunteers partnering with scientists in some form of systematic enquiry. The citizen sciences provide the opportunity to legitimately engage in knowledge production that focuses on the local and the specific without needing to conform to those processes that homogenise towards the universal and the global. It is a powerful system for researching situated contextual challenges, as well as contributing to global understandings of our world.

A few provocative reminders for scientists:

- The professionalisation of science only really started in the 1830s, when the term ‘scientist’ was coined by Whewell.
- The adoption of Cartesian dualism was motivated by a political move, rather than a rational one.
- Scientific knowledge and other forms of knowing tend to be juxtaposed, forgetting that science is constituted through other ways of knowing the world.

- Scientific knowledge does not really belong to the Global North or the ‘metropolitan’. It is just that other knowers have been rendered invisible through the mediation of scientific knowledge and who the designated mediators of this form of knowledge are.
- What science does offer is a particular way of processing knowledge and a particular system of enquiry that is legitimated through scientific protocol.

There are two main forms of citizen science: projects that seek to establish ‘Matters of Scientific Fact’ and huge groupings of projects that leverage scientific knowledge in response to situated risk or those that engage in social ecological justice work (what Latour describes as Matters of Concern). What these projects have in common is what Santos has conceptualised as ‘ecologies of knowledges’, which includes science as one of these knowledges. These ecologies combine various knowledges that work together to deal with a shared interest amongst a particular group of people. Participants and contributors have a shared or overlapping interest, although they might have diverse relationships or priorities related to this shared, and multiple processes and ways of building knowledge about this shared interest.

There are some key epistemic, cognitive and distributive justice challenges that deserve consideration – even though scientific knowledge is constituted through multiple knowledges, with insights and expertise gained from many diverse types of knowers:

- Other knowers and ways of knowing are rendered all but invisible in scientific reporting. Within the sciences this is called plagiarism, but has become a legitimated practice when this knowledge is plagiarised from those outside of the profession of science.
- An understanding of the different bases of legitimation has not been developed and attempts are made to legitimise everything through scientific protocol – this is problematic because not everything can be explained with scientific dualistic ontologies … other knowledges use different bases of legitimation and we need to learn to work with them along these bases, rather than a scientific one.
Ms Vallabh proposed that it is necessary to think about legitimacy based on the power to intervene in context and helping people to live better lives together (drawing on the work of Bruno Latour and Boaventura de Sousa Santos). This requires scientists and their disciplines to recognise that science is not the only way of knowing the world, and that scientific knowledge becomes much more powerful when it is brought into relationship with other ways of knowing the world. The citizen sciences provide a clear and powerful example of the benefit of these types of ecologies of knowledges for dealing with both global and situated risk.

Quo Vadis Science? Why Citizen Science Matters?  
(Prof Willie Tafadzwa Chinyamurindi, UFH)

In a conversation with students from rural communities about the different career options available to them, only a few of the students could engage with anything related to science, particularly in the natural world. This highlights the role of the university and the community of practitioners in assisting communities to develop an active interest in science and raises a question about what is wrong with the way science is being framed.

Universities that collect data from rural communities as part of community engagement have to sign agreements in order to do so. Chiefs in those communities expect to see benefits from the research, especially those that will lead to improved livelihoods of the ordinary person in the community. They complain that researchers appear once a year and go on to celebrate their academic achievements while communities remain unaffected by the research. The UFH has been part of a process of engaging with their immediate communities to address these issues and deems it necessary to give power back to communities that are usually exploited and disempowered in the name of knowledge production using opportunities provided by citizen science.

Prof Chinyamurindi has embraced the challenge of how to approach the notion of research, particularly when working with participatory action research and going into communities. He aims to be part of a process that appreciates the complexity and experiences of fellow human beings. The narrative needs to be rewritten in order to educate communities as well as academics working with the communities and for citizen science to have impact. This constitutes challenging stereotypes that exist about what science is and who can be a scientist, as well as social constructs such as ‘black tax’ and the idea that one must always look out for others at the expense of personal goals.

Involvement in collaborative efforts with communities has been interesting in that people in the communities contribute to the research by assisting academics to understand the issues that affect rural communities. Prof Chinyamurindi intends to produce a collaborative book that tells the stories and celebrates the work of academics, as well as the people in the communities who have enhanced the research projects.

Participatory Water Governance: People and Water  
(Prof Tally Palmer, Rhodes University)

Prof Palmer’s talk addressed the threats to what citizen science projects are trying to do and sounded both a note of hopefulness and caution. She told a story about work she is involved in a particular part of the Mzimvubu River catchment, which brings in all the contextual considerations when working in the world and primarily values which takes account of the social, technical, economic, ecological as well as political aspects.

Several years ago, government announced its intention to build a dam in the Eastern Cape. The idea was greeted with enthusiasm, but the area chosen as the site for the dam had shown to be prone to problems with sedimentation. To overcome this problem, the Department of Environmental Affairs (DEA) undertook on a project to restore the catchment surface to prevent erosion. The Institute for Water Research (IWR) put in proposals for landscape restoration and took the opportunity to influence this very big research project to being systemic, adaptive and having the multiple goals of ecological restoration as well as social goals for livelihoods. There was a deep commitment to including local people in the research process catalysing life in the catchment towards well-being. Citizen technicians were involved in the collection of samples of sediments by local people, but were not included in the vision of the whole project or the deeply integrative idea of the development of the project.
It was anticipated that engaging with local people and empowering them with biophysical water resource and social issue language would enable them to engage with existing governance structures more effectively. Research funding was used to hold a series of strategic adaptive workshops to ensure that all the villages in the area participated in the development of a Catchment Management Strategy by offering their views of what they wanted from their river. This process of developing governance capacity was put into the forefront of the project, which is committed to building participatory water governance in the Eastern Cape. Its citizen science involved the participation of local people in the development of governance capacity, making a conscious attempt not to be extractive.

A successful project with the Kulumani Trust looked at engaging local people in water issues in Grahamstown through citizen engagement. The project helped the Trust establish water entrepreneurs who would sell in-house water barrels. This did not work because the people involved were not able to translate two years of intensive interaction, learning and exposure into a business opportunity. The actual realisation of well-being out of research is very difficult. The protocols that challenge extractive science sufficiently and the embedded partnerships that allow sustainability are not in place.

Citizen Science: The Next Frontier of Innovation
(Ms Duduetsang Mokoele, The Mapungubwe Institute for Strategic Reflection (MISTRA))

Ms Mokoele’s talk aimed to accentuate the cultural, social, political and economic importance of citizen science and its impact.

In its broadest conception, national systems of innovation have to do with the means through which a country seeks to create, acquire, diffuse and practice new knowledge to assist the country and its people to achieve their individual and collective goals. MISTRA prioritises the rise and fall of civilisations and the Kingdom of Mapungubwe is important in this regard. Its story and those of other civilisations on the continent proves that innovation systems on the continent were present and people-centred, without the concern of titles which create the narrative that there are those who can and those who cannot innovate.

The underlying principle of citizen science has to do with democratising science by making it more inclusive and more open, and doing so without being called a bad scientist who produces bad innovation. The pedagogical implications around citizen science are underexplored, particularly in terms of changing attitudes and engagement with science. An unequal education system was inherited from the colonial and apartheid past, and still impacts on who has access to science and who is capable of teaching it. Post-apartheid, much has been done to create a more equal education system and improve access to education. The challenge of implementing citizen science in the classroom can be overcome by incorporating novel and sophisticated resources.

Learning science and the way science is perceived needs to evolve. This involves learning powerful scientific ideas rather than a collection of disconnected procedures for carrying out calculations, as well as learning to generate those ideas and express those using words and symbols.

Thinking Through my Language to Recover Indigenous Epistemologies and Contest Dominant Truths
(Mr Sanele Ntshingana, Rhodes University)

Every society interacts with environmental phenomenon in particular ways that are not universal. Each and every one of these societies makes sense of these observations of their surroundings by communicating them through language. The way in which words are constructed tells a story about the society that uses them. As a child, Mr Ntshingana enjoyed chasing the swarms of locusts (iinkumbi) that appeared after the rainy season. His neighbours were from Venda and used to roast, add salt and dry the locusts, which were called oonobhotolo meaning ‘the ones who have butter’.

Language is a container or a repository of the social experiences and knowledges of the society in which it is spoken. The society passes these knowledge(s) to other generations orally through proverbs, riddles, stories, parables and so forth. Concepts and their related words can give some clues to the meaning of scientific concepts, and the changes of the words through time and social factors can be studied over time. This is important because meanings are influenced by social and political factors and the meanings change over time.
Languages are opened up as a resource to access philosophical modes of representing knowledges of major cultural groups, debunking the myth that languages are not ‘scientific’. Interrogating concepts (such as citizen science) and looking into our own languages will provide other powerful conceptual frameworks from which to see a totally different world, embracing multiversality.

Experiences and Challenges, Case Study: Eskom Expo for Young Scientists
(Prof Marilyn Gibbs, NMU)

The Eskom Expo for Young Scientists is a community engagement project run by volunteers. The expo started about 38 years ago. Its vision is to inspire young scientists and researchers and its mission is to develop young scientists who are able to identify a problem, analyse information, find solutions and communicate findings effectively. Participation in the expo is available to all learners in South Africa and provides them the opportunity to exhibit their science investigations and engineering projects in 24 categories of science driven from a needs or problem based discovery learning strategy. It also provides opportunities for participants to communicate science and network with fellow learners, educators, professional organisations and industry experts from around the world, with science as the unifier.

Siyabulela Xusa is one of many successful African scientists. His science career began with a project on rocket fuel, which was presented at the expo in Mthatha some years ago and went on to win awards at the global level. The potential of his project was identified by an international company and the rocket fuel has been patented by the National Aeronautics and Space Administration (NASA).

Some of the challenges in running the expo include the need for more volunteers, financial sponsors and partnerships, resources and transport, and support and training.

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Discussion and Q&A

Language and Its Contestations

Mr Ntshingana mentioned that that reclaiming indigenous epistemologies through language contests the notion of universality. Knowledge systems and languages exist in communities but some are more dominant than others. If language demands economic value, possibly as a way of asserting itself, it will be necessary to consider both language and the economy in order to change this. Mr Ntshingana indicated that the relevant question has to do with ‘whose economy it is’ and which languages were relegated to the margins and which were centred when languages were ascribed to the economy. The tendency to think that languages are a problem and need to be reclaimed as a means for Africans to reclaim their identity is concerning and gives the sense that many languages did not co-exist in Africa before colonialism. Multilingualism has always been the norm.

Ms Vallabh commented that many of the most revered economic centres in the world were multilingual centres and cultural hubs. Language holds ontology. People are unaware of how dominant the economy has become in everyday life. There are other ways of valuing the world, even though the economy is important, but it becomes difficult to reclaim other forms of value without reclaiming language, which holds and communicates ontology. Economic value should not be the only, or even dominant form of value that is aspired to.

Ms Mokoele mentioned that MISTRA was involved in a process to give post-apartheid South Africa the chance to reflect and reimagine society and the economy. One of the most prominent features of the discussions with leaders from all sectors and the youth was the issue of language and the economy, and the link between the two. Speaking English seems to be able to unlock economic opportunities but at the expense of local languages. She also mentioned that white schools are doing better than black schools. It would appear that doing science in a Western way is a requirement for success in education.

A delegate mentioned that some languages in South Africa have ‘died’ because they lack economic value. People cannot be economically developed if their languages are dead. People are


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being economically developed through a foreign language that they do not fully understand.

Prof Broadbent added that the way different languages are related to the political forces behind them is interesting and may also be a factor in how they develop and to whom they belong.

Prof Odora Hoppers stated that English as a language is very limiting and that indigenous languages are processed languages, different from English. She invited delegates to read her book called, *Indigenous Knowledge and the Integration of Knowledge Systems towards a Philosophy of Articulation* to gain more insight.

‘Black Tax’ as a Social Construct

In his talk, Prof Chinyamurindi mentioned social construction, giving the example of ‘black tax’. The term ‘black tax’ has to do with the family structure, but is colonialist. While there is a need for black people to be educated, how can communities be empowered without hurting each other? Prof Chinyamurindi explained that some of his students refused to accept bursaries to do postgraduate studies because their families expected them to find employment rather than studying further. There is an exploitative element to this narrative and there needs to be a balance between responsibility and exploitation. A frank discussion must be had about this issue and the concept of ubuntu. Within ubuntu there should be some form of individual expression and individuality, but it is framed to be about everybody and community. Part of the framing of everybody centres from the individual. These ideas also need to be mentioned. Africans are not homogenous and there must be space for different forms of expression. There is something wrong when a family only thinks of immediate gain in a child bringing home very little income from a menial job rather than investing in a postgraduate qualification that could bring in lots of money for the family. This is not a comfortable conversation to have, particularly with people who are collectivists.

Participatory Water Governance

Prof Palmer was asked whether the people in the area around where the dam would be built were aware of the environmental and social implications of the dam on their community and of the possibility that they would have to be relocated to make way for the dam. She indicated that the people were unaware and this was a major concern. In the DEA’s and IWR’s engagements around environmental and water governance and management issues with those communities, the predominant conversation that the people wanted was about the dam and its implications for them.
• Power and dominance of knowledge is constructed through language.

Africa mediates knowledge and teaches and learns about others and self through (exogenous) language. In any effort of (re)production of knowledge within and between linguistic systems, meanings are always renegotiated with the intention of giving historical, sociocultural and other interpretations. Knowledge in (South) Africa indicates the space from which memory erasure was galvanised. Language as a medium of communication is not as important as ideas, knowledge and wisdom embedded in it (Mafeje, 1994: 64–67) because a Xhosa concept can be communicated using English and similarly, English can communicate an English concept using isiXhosa. Any language possesses power for authentic representation of knowledge, but power around language and knowledge is socially constructed.

Naming makes sense in the primary language of the ‘inventor’, but it might not make the same sense in a secondary context using the same (initial primary) language. Much of what is valuable and important to Africans has been forgotten. Part of this erasure requires unlearning the privilege of education.

Science is owned and expressed in powerful languages from someone’s experience, but the African experience and languages are marginalised from this. Instead, science in Africa is expressed in powerful languages and gets imposed on the less powerful, and presented as universal. Some IKSs are appropriated, renamed in foreign languages and presented as foreign even to the societies from where they emanated. The gap is not only in terms of imposition and marginalisation, but also between ‘science’ and ‘indigenous knowledge’. However, this has implications for learning, production and application of scientific solutions to African problems.

The importance of language lies not only in it as a means of basic communication, but in its ability to convey knowledge that encodes values, norms, ideas and thoughts of a society that speak it. Given the brutal colonial history of South Africa that introduced literacy and used this as a tool to construct power around Western languages and knowledge, the challenge is that African ways of knowing must be unlearnt and learned to be learnt. The challenge lies not in the lack of knowing, but in the lack of making sense of what Africa knows.

**IKS in Science, Teaching and Learning**

(Mr Motheo Koitsiwe, IKS Centre, North-West University (NWU))

Mr Koitsiwe discussed the tendency in Western/Eurocentric mainstream education to teach African children knowledge, skills and values stripped of local and indigenous context. He called for pedagogical approaches that decolonise education for Africans learners and students so that they are nurtured in linguistically and culturally appropriate holistic learning environments that meet their individual and collective needs as Africans by:

**Indigenous Ways of Learning**

Cultural diversity in the classroom provides learners and students with opportunities to engage in different viewpoints while developing their own opinions. It enables them to explore diverse cultural relationships with the natural world and encourages learners to open their minds to different ideas and perspectives.

**Contemporary Indigenous Ways of Teaching**

Although contemporary teaching systems include both written and oral forms, traditions associated with oral philosophies are common in both forms. For instance, stories and storytelling remain a common way to share knowledge and skills with the next generation in indigenous communities.

**The Role of Elders in Science Education**

It is recommended that elders have an active role in education and be treated as professionals, and respected for their expertise, unique knowledge and skills. They must be seen as authoritative community stakeholders in developing culturally relevant science curricula.

**Understanding Western versus Indigenous Science**

Indigenous science is the process by which indigenous people build their empirical knowledge of their natural environment. As is the case with Western science, indigenous science is the practical application of theories of knowledge about the nature of the world and Western
scientific principles are increasingly becoming evident in indigenous peoples’ social practices. Like Western science, indigenous science relies upon experimentation and direct observation for forecasting and generating predictions. There are cultural tests and cross-referencing of knowledge production methods involved to ensure validity and reliability. Individuals are trained in various fields of specialisations based on community needs. These include herbalism, farming systems, postharvest technologies, natural resource management systems, weather observations, indigenous games, mental health and time keeping just to name a few.

Mr Koitsiwe noted that the decolonisation of education in South Africa and Africa at large needs pedagogical approaches that nurture Africans learners and students in linguistically and culturally appropriate holistic learning environments that meet their individual and collective needs as Africans. This will mitigate the tendency of Western/Eurocentric main-stream education to teach African children knowledge, skills and values stripped of local and indigenous context.

(Prof James Ogude, University of Pretoria)

When thinking through issues of decolonisation, it is important to understand the idea of Africa because this influences the way Africa is thought about, talked about and theorised. Prof Ogude’s presentation looked at two ideas of Africa that have been in vogue within scholarship:

- Thesis Two: Africa as an Invention.

The first thesis, while dealing with the schism caused by colonial modernity tended to romanticise African traditions while the second thesis presented colonialism as an over-determining phenomenon, erasing any local agency.

Prof Ogude presented a critique of these two dominant ideas and offered a third alternative called a nationalist and post-nationalist

Africa – an Africa that aspires to worldly intelligibility and is enjoined to be both nationalist and post-nationalist. He then looked at how a certain reassertion of agency (in this case, the repudiation of victimhood) can allow Africa to engage with the rest of the world, and the idea of travelling theory and how to engage with it in a context or continent such as Africa where global theoretical protocols move in and out with ease, and what this means for knowledge production.

He concluded that:

- The challenge for African scholars, as for scholars of Africa, is to bring African experiences to bear in the constitution of knowledge.
- In order for knowledge production to flourish in Africa, the critic’s or the scholar’s job is to provide resistances to theory, to ideas, especially dominant ones, and to open them up toward historical reality, toward society, and toward human needs and interests.

Edward Said said, “A single overmastering identity at the core of the academic enterprise, whether that identity be Western, African, or Asian, is a confinement, a depriviation”. To deny this is to deny the enlargement of mind.

Discussion and Q&A

Nationalism and Language

Prof Ogude was asked how one can move beyond the argument among scholars that nationalism in Africa has never been imagined and that there was never a fully lived nationalist experience on the African continent. Nationalism is mistaken as the struggle for independence. Related to this is the fact that all the countries that are on good developmental trajectories have developed on the basis of very strong nationalistic impulses and strategic investment in companies owned by people of those countries, backed by state funds. Prof Ogude indicated that he was not convinced that Africa did not have nationalism. The terms ‘nationalism and post-nationalism’ convey the importance for Africa to look inward and outward. There is a sense that the colonial struggle forced Africans to imagine themselves in
many ways, breaking boundaries that had never been broken. If it wants to engage with the rest of the world, Africa must start by having an internal dialogue with itself. African wars (between African nations) are regarded as outrageous, yet similar wars in Europe are not viewed this way.

Prof Maseko was asked how a meaningful message can be conveyed in a manner that it is understood by each student in a classroom with multicultural students who speak different languages. She responded that diversity in the classroom is ignored and one kind of knowledge is focused on and presented as THE knowledge, thereby suppressing other knowledges. There is a relationship between access to knowledge and success. One of the reasons for the high failure rate of black students in education is that knowledge is mediated to another language. It is important to acknowledge all kinds of knowledge in the classroom, and centre Africa in that. Prof Nkomo added that the use of the ex-colonial (powerful) languages has been accepted as the norm and is also motivated by convenience. There is the idea that using English will unite everyone and bring a common understanding. However, the fact that the majority of people engaged in knowledge production and reproduction are also doing that by means of foreign languages, is ignored. This raises a question about how much of what teachers are teaching has been fully understood and processed by them, underlining the importance of language, even to the teachers.

Prof Odora Hoppers pointed out that colonial languages influence the laws that govern African people. Referring to the point about nationalism in Africa, she remarked that so many people died in the wars of liberation and once independence was achieved, Africans became proud, but the West was pernicious in its observations throughout Africa and got rid of potential nationalist leaders.

Delegates requested the SAYAS symposium organising committee to include this topic in the programme of future symposiums and to allocate more time for discussion.

IKS

Mr Koitsiwe was asked how best IKS could be used in communicating ideas about social norms and values today. He responded that Africans needed a paradigm shift to realise that IKS exists and can be used to address societal issues. IKS and its application in everyday life and in education ought to be taught about in schools and universities. Most universities do not have policies that address IKS. NWU started a curriculum on IKS, teaching the application of IKS in everyday life, in particular for conflict resolution and moral regeneration, and to create an environment conducive for peace.

Theme 6: ‘No Longer at Ease’ with the Curriculum as It is not Business as Usual - Crafting a Way Forward
(Facilitator: Mr Qinisani Qwabe, NMU)

Curriculum without Borders: Working with Curriculum Uncertainty
(A/Prof Nyna Amin, University of KwaZulu-Natal (UKZN))

Prof Amin addressed the issues of uncertainty in relation to the curriculum, which encapsulates everything that academics do. She began with the notion of manufactured subjectivity (as opposed to identity) in which one is forced to be something that one is not. An example of manufactured subjectivity is the imposition of language and religion on children by parents, family and community.

Although Prof Amin noted that she had been cognitively damaged by European theories, she has found that these theories have given her the language of critique — it has conscientised her and educated her about marginalisation and subjection to ideology. The move towards decolonisation would require a careful deployment of western tools of critique as a means to decolonise the curriculum. A complication is that its content and approaches remain uncertain. Instead, there are answers in search of questions.

When preparing UKZN students to become teachers, she realised that the curriculum assumed that they would all teach in first world classrooms while ignoring the realities of the local context. When asked by the university to rethink the first year teaching practice for future teachers, Prof Amin took on the task of redesigning the curriculum, a bordered entity, to enable it to be contextually relevant and appropriate for South African conditions and came up with a four-stage intervention.
an approach that comprised reframing memory, disrupting experience, destabilising learning and reconstructing uncertainty.

Additionally, to transform the curriculum, the hidden (unintended learning), the restricted (narrow and hollow curriculum), and the null curriculum (crucial local and cultural content not in the curriculum) were considered. When the hidden, restricted and null curriculums are viewed through a post-structural lens, they unveil the uncertainty, unpredictability and variation of their design.

Prof Amin described some practical ways in which a ‘borderless curriculum’ was applied in the first-year teaching practice course.

Decolonising Science in Higher Education through Responsive Curricula (Dr Thoko Batyi, NMU)

In 2015 and 2016, students (in South Africa) called for the decolonisation of higher education. This was an expression of alienation from the higher education institutional context and culture, academic knowledge taught in disciplines and some ways in which they are taught. Many university graduates are unemployable, which points to a misfit between the curriculum and societal needs. Students participate in higher education in order to gain knowledge and they have to gain epistemological access to the disciplines. That means curricula, teaching and assessment have to be designed in ways that induct students into the knowledge of their fields.

Decolonising the curriculum is not about adding ideas of African scholars into the existing curriculum, but putting African thought at the centre as a legitimate epistemic site from which to experience the world (Msila, 2017). It is essential to return to the base, which is the people and the languages they speak. Students are calling for the shift of the geography and biography of knowledge. A curriculum is the centre of the academic project and is the planned process, the actual teaching and learning and the students’ learning process. Students are no longer comfortable with the curriculum in higher education, yet are under pressure to achieve. It is necessary to develop a responsive curriculum — one that responds to a changing national and global environment in an African context, as well as the economic needs of society and has the African experience at its core. Institutions have to inform the disciplines and the disciplines have to inform learning. The knowledge students already have (for example their language and experiences) need to be taken into account and examples need to be taken from their life histories and experiences. Threshold concepts have to be learned through trans-languaging between students’ own languages and English. They must be taught in order to enable students to fully understand and access knowledge, and foundational knowledge must be understood before complex ideas can be grasped.

The following questions need to be asked when designing curricula:

- What knowledge traditions are the content of courses drawn from?
- Why those particular knowledge traditions and not others?
- Is it possible, given the particular field, to draw knowledge from other traditions?
- Can examples of how the knowledge relates to African contexts be included?
- Is it possible to show how the knowledge is linked to the histories/ experiences of different students in the class?
- In what ways does the knowledge validate/challenge students’ experiences/lives?
- Are there aspects of the curriculum, pedagogy and assessment practices that some students may find alienating? (Vorster, 2015).

Decolonisation and Transformative Pedagogy: The Case of Political Theory (Dr Ayesha Omar, Wits)

Dr Omar’s presentation reflected on what decolonisation and transformative pedagogy in one aspect of the curriculum (political theory) might constitute, and considered what it would mean to deparochialise and decolonise political theory as charges of Eurocentricism are particularly valid within this discipline.
Reference to decolonisation, when invoked in political theory, is arguably distinct from the transposed historical meaning. The decolonisation being invoked can be thought about in the epistemological domain, which raises three interrelated ideas:

- Knowledge is not value free but value-laden.
- Eurocentric values are linked to colonial patterns of power.
- In the context of unequal power relations of knowledge, Eurocentrism serves to continually reinforce epistemological inequality.

Hence, the issue that ought to be interrogated is how Eurocentrism can be understood and then subverted or transcended. Here, the interventions and responses surveyed in recent literature are iterations of a much broader project to liberate thinking and theorising from the epistemology of power, inequality and various forms of discrimination and exploitation. The calls for decolonisation are underpinned by the logic that there is a crucial need to revisit epistemic questions in the university curricula, which continue to be embedded in Western and Eurocentric bias and which do little to promote and reflect non-Western, especially African, expressions and ideas. If universities are to serve as sites of contestation, interrogation, subversion and even reinvention, thinking about Eurocentrism broadly and reference to the curriculum is vital because the curriculum is reflective serving an intended purpose and projecting the intrinsic relations of power in knowledge production. It is important to provide a critical account of what is being taught and why it is being taught. The first task is to scrutinise and reflect on the question of Eurocentrism as it permeates scholarly and teaching discourse.

In almost all the major traditions of thought there exists a level of political theorising on political questions informed by the practical intuition that politics is about people, power and resources. The range and depth of this theorising insofar as they seek to resolve ethical and moral conundrums, or are tied to historical processes and institutional arrangements, reveal that a wide array of possibilities exists in politics that remain equally influenced by matters of the human and social world. The noticeable neglect of how political theory is developed elsewhere, what intuitively guided these developments and why it differed so profoundly with the Western path, is remarkably under-developed and ignored. This means that political theory that emerges from Africa and elsewhere in the world is treated with disregard.

Thinking about what a transformative pedagogy in political theory would constitute, requires thinking in explicit ways about the pedagogical predicament outlined in this presentation and taking the task of disembracing the historical failures and injustices of the past. Should one aim to reject the canon completely, or transcend liberalism? Or should one imagine and deconstruct decolonial options? Perhaps, the Western canon should be treated as singularly complex and a resource of its own reputation. The decolonising enterprise has a long way to go in political theory and it will mean a complete shift in rethinking, locating Europe in a particular part of the world rather than at the centre of the world.

**Evaluating the Ability of Students to Understand and Apply their Knowledge: Crafting a Way Forward for 21st Century Teaching and Learning Curriculum**

(Dr Mukund B Khatry-Chhetry, Walter Sisulu University (WSU))

Dr Khatry-Chhetry presented a brief overview of a quantitative study undertaken in March 2017 that looked at whether students can comprehend satisfactorily what they have learned. Fifty first-year undergraduate students in Medicine in Clinical Practice at WSU were included in the study, which applied a pre-test-post-test design and a quasi-experimental design method. Statistical analysis software compared two mean values of multiple choice questions (MCQs) matching (pre- and post-learning session) with modified essay questions (MEQs). The analysis of the data showed that there were statistically significant differences between the mean of the MCQs and the mean of the MEQ. The clear gap between the students’ ability of knowing and interpreting the knowledge acquired was an indication that the students needed more time or a different way of learning in order to internalise the knowledge.

The study highlighted the need for a paradigm shift in terms of teaching and learning, redesigning the curriculum and the use of an active rather than the traditional passive learning process. Several possible options were recommended for consideration, namely:
• Multi-professional Education (MPE): A generic term for workplace-based or undergraduate learning in which people from different professional backgrounds learn together. This mechanism results in more effective teamwork and ultimately improved patient care.

• Problem-based learning (PBL): A student-centred pedagogy in which students learn about a subject through the experience of solving an open-ended problem. The PBL tutorial process involves working in small groups of learners.

• Community-based learning (CBL): Learning that incorporates the community and immediate environment into the teaching approach. The overall goal is to integrate community into academic learning.

• Student-centred learning: A wide variety of educational programmes, learning experiences, instructional approaches and academic support strategies that are intended to address the distinct learning needs, interests, aspirations or cultural backgrounds of individual students and groups of students.

• Work-based learning (WBL): An educational strategy that provides students with real life work experiences where they can apply academic and technical skills and develop their employability. WBL programmes are targeted to bridge the gap between the learning and the doing.

Dr Khatry-Chhetry suggested that the teaching, learning and assessment tools currently used are outdated and that it is time for them to be brought up to date and made more relevant.

Discussion and Q&A

The idea of power of uncertainty was highlighted. In university systems one is credible when one is certain, but is it disempowering when trying to reclaim and re-imagine that that which is not well articulated or expressed. The rush to certainty means losing the opportunity to be epistemologically humble, that is being tentative about produced knowledge and to be open to new ideas. One of the biggest crippling factors in education is that ‘facts’ are presented as truths and certainty is taught to school children. They have to unlearn received facts and encounter uncertainty when they enter higher education and the work in the real world.

Prof Amin indicated that certainty is a myth. Certainty relies on the past and what is known while accepting uncertainty forces one to value dynamism and change and to be forward looking. Even in the hard sciences, Heisenberg’s principle of uncertainty is a reminder that doubt is significant. The time for certainty is over.

The biggest problem is that the burden to decolonise is on higher education while it is everybody’s problem and everyone needs to decolonise education. The complicity of government against decolonisation has been absent in the debates at the colloquium because structural impositions are difficult to fight against. Dr Batyi commented that using the same tools as the colonisers will not advance decolonisation.

Prof Amin mentioned that her first-year students were exposed to real-life contextual realities in schools. The exposure to different contexts helped them to realise that a curriculum based on certainty will not be useful when they go out as qualified teachers. This experience and the insight gained from it was essential for students and a similar approach could be useful in many more departments at universities.

Dr Gibbs suggested that delegates should look at a video by Jack Ma, a Chinese educationalist, addressing the World Economic Forum. He talks about the skills being taught to learners to prepare them for the 21st Century workforce and competition with machines, suggesting that knowledge-based education is a big mistake because humanness will define the unique skills when faced with a technological world. Values, music and art will be critical. This issue needs to be taken into account in teaching and learning in South African universities.

Dr Khatry-Chhetry indicated that students need to take ownership of identifying and resolving their learning problem(s). He gives students the chance to say what they already know and what else they need to know (knowledge gap) about a topic in class. They then go back with those gaps of knowledge and find out more about the topic and present it to the class in the next discussion. This gives the students the responsibility of finding the solution of their problem themselves so as to develop the confidence of problem-solving capacity. The curriculum today (particularly in medicine) needs to address the needs of ordinary people so that the health care providers are able to assist their patients.
Wrap-up of Symposium
(Dr Nosiphiwe Ngqwala, SAYAS ExCo)

Dr Ngqwala emphasised the degree to which the enlightening presentations and interesting discussions had contributed to the symposium, and indicated that SAYAS planned to take the conversation on this bold topic forward and will seek the assistance and support of ASSAf.

Vote of Thanks
(Prof Philani Moyo, SAYAS Co-Chair)

On behalf of the organising committee, Prof Moyo thanked all the delegates and presenters for giving of their time to be part of the symposium and acknowledged the excellent work done by the SAYAS Secretariat.
# APPENDIX A: LIST OF ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACMS</td>
<td>African Centre for Migration and Society</td>
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<tr>
<td>AD</td>
<td>Alzheimer’s disease</td>
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<tr>
<td>ASSAf</td>
<td>Academy of Science of South Africa</td>
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<tr>
<td>CBL</td>
<td>Community-based learning</td>
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<tr>
<td>DEA</td>
<td>Department of Environmental Affairs</td>
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<tr>
<td>DST</td>
<td>Department of Science and Technology</td>
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<tr>
<td>ExCo</td>
<td>Executive Committee</td>
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<td>ICSU</td>
<td>International Council for Science</td>
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<td>IKS</td>
<td>Indigenous Knowledge Systems</td>
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<td>IWR</td>
<td>Institute for Water Research</td>
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<tr>
<td>LED</td>
<td>Light-emitting diode</td>
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<tr>
<td>LGBTQ</td>
<td>Lesbian, gay, bisexual, transgender and queer</td>
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<tr>
<td>MCQ</td>
<td>Multiple choice question</td>
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<td>MEQ</td>
<td>Modified essay question</td>
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<tr>
<td>MISTRA</td>
<td>Mapungubwe Institute for Strategic Reflection</td>
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<tr>
<td>MPE</td>
<td>Multi-professional education</td>
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<tr>
<td>NASA</td>
<td>National Aeronautics and Space Administration</td>
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<td>NMU</td>
<td>Nelson Mandela University</td>
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<tr>
<td>NRF</td>
<td>National Research Foundation</td>
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<td>NWU</td>
<td>North-West University</td>
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<td>PASCAL</td>
<td>Place And Social Capital And Learning</td>
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<td>PBL</td>
<td>Problem-based learning</td>
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<td>SARCHI</td>
<td>South African Research Chairs Initiative</td>
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<tr>
<td>SAYAS</td>
<td>South African Young Academy of Science</td>
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<tr>
<td>STEM</td>
<td>Science, technology, engineering and mathematics</td>
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<tr>
<td>TMALI</td>
<td>Thabo Mbeki African Leadership Institute</td>
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<td>UCT</td>
<td>University of Cape Town</td>
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<td>UFH</td>
<td>University of Fort Hare</td>
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## APPENDIX B: LIST OF ATTENDEES

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
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<tbody>
<tr>
<td>Mr Gloire Aime Aganze</td>
<td>DST-NRF Centre of Excellence in IKS, University of KwaZulu-Natal</td>
</tr>
<tr>
<td>A/Prof Nyna Amin</td>
<td>University of KwaZulu-Natal</td>
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<tr>
<td>Dr Thoko Batyi</td>
<td>Nelson Mandela University</td>
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<tr>
<td>Prof Alex Broadbent</td>
<td>SAYAS and University of Johannesburg</td>
</tr>
<tr>
<td>Ms Sibongile Buda</td>
<td>Ethnomusical Performer</td>
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<tr>
<td>Prof Wille Chinyamurundi</td>
<td>University of Fort Hare</td>
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<tr>
<td>Miss Allison Derricks</td>
<td>Eskom Young Scientist, Collegiate High School, Port Elizabeth</td>
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<tr>
<td>Ms Heather Erasmus</td>
<td>Write Connection (Scribe)</td>
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<tr>
<td>Dr Marilyn Gibbs</td>
<td>Nelson Mandela University</td>
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<tr>
<td>Master Daniel Holmes</td>
<td>Eskom Young Scientist, Grey High School, Port Elizabeth</td>
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<tr>
<td>Mr Robert Inglis</td>
<td>Jive Media</td>
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<tr>
<td>Dr Mukund Khatry-Chhetry</td>
<td>Walter Sisulu University</td>
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<tr>
<td>Mr Motheo Koitsiwe</td>
<td>North-West University</td>
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<tr>
<td>Master Junaid Kynoch</td>
<td>Eskom Young Scientist, Sanctor High School, Port Elizabeth</td>
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<tr>
<td>Ms Bongiwe Lusizi (Mthwakazi)</td>
<td>Ethnomusical Performer</td>
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<tr>
<td>Ms Marvin Mandiwana</td>
<td>Academy of Science of South Africa</td>
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<tr>
<td>Prof Pamela Maseko</td>
<td>Rhodes University</td>
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<td>Lizalise Mngcele</td>
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<td>Ms Duduetsang Mokoele</td>
<td>The Mapungubwe Institute for Strategic Reflection</td>
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<td>Name</td>
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<tr>
<td>Prof Philani Moyo</td>
<td>SAYAS and University of Fort Hare</td>
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<td>Prof Enocent Msindo</td>
<td>Rhodes University</td>
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<tr>
<td>Ms Kensane Mthembu</td>
<td>DST-NRF Centre of Excellence in IKS, University of KwaZulu-Natal</td>
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<tr>
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<td>Dr Nosiphiwe Ngwala</td>
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<tr>
<td>Dr Naomi Nkealah</td>
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<td>Mr Qinisani Qwabe</td>
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<td>Dr Tozama Qwebani-Ogunleye</td>
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<td>Dr Nadia Sanger</td>
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<td>Prof Puleng Segalo</td>
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<td>Ms Edith Shikumo</td>
<td>SAYAS Secretariat</td>
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<tr>
<td>Ms Priya Vallabh</td>
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<td>Ms Henriette Wagener</td>
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<tr>
<td>Dr Sahal Yacoob</td>
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<tr>
<td>Mr Nekile</td>
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<td>Sandi Andiswa</td>
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<tr>
<td>Ms Marvin Mandiwana</td>
<td>Academy of Science of South Africa</td>
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