

HUMAN AND SOCIAL DYNAMICS (HSD) RESEARCH SEMINAR SERIES

# THE ROLE OF THE SOCIAL SCIENCES IN SCIENCE ENGAGEMENT

10 March 2015



science  
& technology

Department:  
Science and Technology  
REPUBLIC OF SOUTH AFRICA



HSRC  
Human Sciences  
Research Council

**Information Circular**

**Human and Social Dynamics (HSD) Research Seminar Series**

**THE ROLE OF THE SOCIAL SCIENCES IN SCIENCE ENGAGEMENT**

**10 March 2015**

**The Amethyst room**

**CSIR Conference Centre**

**Pretoria**

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## **INTRODUCTION**

We look forward to your participation in the Human and Social Dynamics Research Seminar, which the Department of Science and Technology (DST) is hosting in collaboration with the Human Sciences Research Council. The seminar will focus on 'The role of the social sciences in science engagement'. This seminar is scheduled to take place on 10<sup>th</sup> March 2015 in the Amethyst room at the CSIR Conference Centre, Pretoria.

## **PURPOSE OF DST RESEARCH SEMINARS**

The Department of Science and Technology (DST) Human and Social Dynamics Research Seminar Series is designed to showcase research and knowledge production in the social sciences, serve as a vehicle for disseminating research evidence to wider audiences, operate as a platform for the sharing of local and international expertise and experience, and promote research in the social sciences that benefits and enhances the National System of Innovation (NSI).

The Research Seminar Series aims to:

- Disseminate research findings through critical dialogue to the social science research community and other interested actors in the NSI;
- Provide an avenue for researchers from a wide range of institutions to engage with other actors in the NSI;
- Discuss extant research, identify research gaps, and suggest new research agendas in the social sciences with a view to forging closer links between the research communities in these fields;
- Reinforce the visibility of social sciences research to the higher education and science council sector;
- Support collaborative and interdisciplinary research within and between universities and Science Councils, and
- Enhance the public understanding, value, and status of social sciences research.

## **BACKGROUND TO THE PROPOSED SEMINAR**

'Science engagement' refers to the engagement between institutions of science and the broader public. The institutions of science include universities, research institutes, science facilities, museums, science centres, private laboratories, and public sector actors such as the Department of Science and Technology and the National Research Foundation. The structure and functioning of these institutions has traditionally been a central concern of science policy, which has drawn on innovation systems theory with the aim of improving the performance of national systems of innovation and thus harnessing increased socio-economic benefits from science.

However, globally, there has been growing recognition that the benefits of science, technology, and innovation are premised not only on economic drivers and innovation systems, but also on social drivers – on the manner in which science and technology are embedded in society. Conceptualising, measuring, and analysing these social drivers is increasingly seen as critical to the formulation of socially responsive science policy that includes mechanisms for engagement between the institutions of science and the general public. Examples of such engagement include communication through various media channels, direct public outreach, and public participation in science policy processes.

This extends the scope of science policy beyond the traditional domain of innovation studies, and into the broader domain of the social sciences. Social scientists and philosophers of science have sought to re-conceptualise the nature of science as a social phenomenon, moving beyond narrow instrumentalist interpretations and objectives, and embracing the complexities of social landscapes and ambiguous normative models. Simplistic notions which position science as a hegemonic world view and an unchallenged social good are not sufficient, as they do not take account of social and cultural formations and responses outside the scientific world view. At the same time, the power and potential of science needs to be recognised, and its unique characteristics need to be harnessed for the benefit of society. Examples of this tension include public ambivalence over controversial technologies such as genetically modified organisms and nuclear energy, as well as uneasy relationships between mainstream science and indigenous knowledge systems, between innovation-driven growth and inclusive sustainable development, between rapid socio-economic change and personal wellbeing, and between science and contrasting religious world views.

Research into social aspects of science has begun to shed light on this complex relationship between science and the public. Research efforts have sought to understand public attitudes towards science, public knowledge about science, and public sources of information about science. For example, Reddy *et al.* (2013) found that most South Africans felt that we depend too much on science and not enough on faith, and that science makes our way of life change too fast. At the same time, the majority also felt that science is making our lives healthier, easier, and more comfortable. These contrasts and complexities highlight the importance of undertaking evidence-based assessments of how citizens form attitudes and how public opinion is shaped and composed, in order to inform public policy.

Science engagement policy falls within the ambit and mandate of the Department of Science and Technology. Since the advent of democracy in South Africa, the Department has been developing policies and mechanisms supporting science engagement, but largely in a fragmented manner. In order to create a more coordinated environment to enable stakeholders to play more effective roles, the Department has, after extensive consultation, generated a Science Engagement Framework. The Framework acknowledges that an awareness and understanding of why science and research are critical to our lives is essential for developing an innovation culture: 'To fully realise the social, economic and environmental benefits of the significant investment in science, research and innovation, as a country, we must communicate and engage the wider community more fully in science and an understanding of the knowledge economy to which we aspire'. As such, the Framework aims to define a coherent strategic direction for science engagement by the DST and its partner organisations.

The Framework aims to draw together and streamline a variety of initiatives supported by DST strategies and policies. The DST's mandate, in terms of the 1996 *White Paper on Science and Technology*, includes the delivery of science awareness campaigns that contribute to the creation of a society that values science and technology as socioeconomic tools. Other policy documents that include aspects related to science engagement include the *National Research and Development Strategy* (2002), the *Youth into Science Strategy* (2006), the *Ten Year Innovation Plan* (2008) and the *Framework for the Promotion of Excellence in a National Network of Science Centres* (2012). The operational context for these strategies and policies includes the South African Agency for Science

and Technology Advancement (SAASTA), a business unit of the National Research Foundation (NRF), which has become the primary implementing agency for DST science engagement efforts. The DST also supports a network of 31 science centres, seven science festivals, the National Science Olympiad, and the National Science Week. Other mechanisms include outreach programmes at national science councils and research facilities.

Science engagement in South Africa faces a number of challenges, including low levels of maths and science literacy, and high inequality in educational attainment, which, according to Reddy *et al.* (2013), is the strongest demographic variable to impact on attitudes towards science in South Africa. Operationally, science engagement is currently constrained by limited public funding, limited co-ordination across actors, a lack of long-term strategic orientation across the system, and a lack of clarity regarding long term impact and monitoring and evaluation mechanisms. The South African media also face significant challenges in science reporting due a lack of dedicated structures for science journalism and a limited pool of qualified science journalists.

In response to this context, the Framework has an overarching vision for ‘A stimulated and engaged South African society that is inspired by and values scientific endeavour, critically engages with key science and technology issues, and participates in a fully representative science and technology workforce’ and a mission ‘To support and promote communication of and engagement with science to diverse constituents at all levels of society, using the most appropriate technologies, whilst respecting social and cultural contexts’. This informs the four main strategic aims of the Framework:

- To popularise science, engineering, technology and innovation as attractive, relevant and accessible in order to enhance scientific literacy and awaken interest in relevant careers.
- To develop a critical public that actively engages and participates in the national discourse of science and technology to the benefit of society.
- To promote science communication that will enhance science engagement in South Africa
- To profile South African science and science achievements domestically and internationally, demonstrating their contribution to national development and global science, thereby enhancing its public standing.

#### **OBJECTIVES FOR THE SEMINAR**

The seminar will aim to reflect on science engagement in South Africa, against the background of the DST’s new Science Engagement Framework. This will include reflection on the broader role of science in society, and on the role of the social sciences in science engagement, including the conceptual and empirical challenges that face researchers and policy-makers. Participants will also reflect on the Science Engagement Framework from the national, international, and developing country perspectives. On this basis, the seminar will examine prospects for the implementation of the strategy. Using the Square Kilometre Array telescope as a case study, we will examine how the different dimensions of the science engagement debate and actors can work together to successfully implement a science engagement strategy

## PROGRAMME

**Rapporteur:** *Dr Stephen Rule*

**Chair:** *Prof Michael Kahn, University of Stellenbosch*

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08:30 - 09:00 **Registration, Tea & Coffee**

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09:00 - 09:10 **Introduction**

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09:00-09:10 **Welcome and Introductions**

*Dr Vijay Reddy, Executive Director: Education and Skills Development Research Programme (ESD), HSRC*

*Dr Temba Masilela, Deputy CEO: Research, HSRC*

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09:10 – 09:50 **Session 1**

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09:10 - 09:30 **The DST Science Engagement Strategy: facilitating the science:society interface**

*Dr Thomas Auf der Heyde, Deputy Director-General: Research Development and Support, DST*

09:30 -09:45 **Q&A**

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09:45 – 10:00 **Tea break**

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10:00 – 10:45 **Session 2**

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10:00 – 10:30 **Science Engagement: Some epistemological reflections**

*Prof Johann Mouton, Director of the Centre for Research on Evaluation, Science and Technology (CREST) and the DST/NRF Centre of Excellence for Scientometrics and STI Policy*

The imperative for scientists to engage with different publics is accepted as self-evidently true. But what does this mean exactly, and what are the historical and epistemological roots of this idea? In this presentation I will first look at some key historical developments in epistemology (Francis Bacon, Alfred Schutz, Robert Merton and social constructivists) which shed light on the underlying philosophical assumption of a commitment to science engagement. In the second part of my presentation I will ask whether there is an inherent contradiction (or at least “tension”) between the aims of science engagement and the imperative of science to produce “objective” and “credible” evidence.

10:30 – 10:45 **Q&A**

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**10:45 – 11:45 Session 3**

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**10:45 – 11:30 Promoting a Scientific Culture: A Review of Public Policies in Ibero-American Countries**

*Dr Carina Cortassa, Researcher, REDES (Argentina), an associate institution to the CONICYT (National Council of Science and Technology)*

This presentation provides an overview of a recent study aimed at describing how the efforts to improve the public engagement with science have gained ground in the broader frame of public policies for Science, Technology and Innovation (ST&I) in Ibero-American countries. The purpose was to assess to what extent the discourse of public agencies reflected concern about the matter, and in which way, beneath the level of rhetoric, the usual ‘loud and clear’ claims were translated into operative strategies, actions and tools. Documentary research included the 22 countries of the Organization of Ibero-American States. Current National Plans for ST&I were analysed, and actions promoted by governmental agencies were identified and classified. The outcomes show a complex scenario. Most countries explicitly encompass the topic of scientific culture and the need to improve public engagement with science in their respective sectoral plans. This implies a shift in visibility from a certain status of “note in the margin” held by this domain in the past. The launch of specific governmental areas responsible for sketching the general strategies and carrying forward concrete activities also indicates intentions to strengthen this progress.

However, although the general outline is promising, a set of pending issues emerges. Firstly, there remains a gap between the ambitious goals expressed in rhetoric and the limited actions actually carried out. Secondly, the broad diversity of practices labelled in each context under the tags of popularization, social appropriation of knowledge, scientific culture, public engagement, and so on, makes it difficult to achieve a reliable picture of regional policies, and also hinders the possibility of assessment and comparison. Concluding remarks highlight the need to develop set of common indicators that facilitate more comparative cross-sectional studies.

11:30 – 11:45 **Q&A**

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**11:45 – 12:30 Session 4**

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**11:45 – 12:15 Attitudes to science: part of the puzzle to improve educational achievement?**

*Dr Vijay Reddy, Executive Director, ESD, HSRC and Andrea Juan, ESD, HSRC*

Learning is influenced by both cognitive and non-cognitive factors. While there is a substantial body of research about the cognitive domain, less is known about the non-cognitive and its influences on the learning processes. The emerging literature examining the relationship between attitudes to learning science and science achievement is mixed, with some studies exhibiting consistent positive correlation, some slight correlation, and others exhibiting no relationship. This paper examines the attitudinal patterns and the relationship between attitudes to learning science and science achievement in South Africa. The paper uses TIMSS 2011 science achievement and science attitudinal data (enjoyment, valuing science and self-confidence in ability to learn science) to examine the relationship. The key findings are: (i) students who enjoy science value the utility of science highly and are modest in evaluating their science abilities (ii) self confidence in learning science and the enjoyment of science are positively correlated with achievement (iii) each attitudinal scale point increase in enjoyment improves performance by 16 TIMSS points and the increase in self-confidence improves performance by 10 TIMSS points.

12:15 – 12:30 **Q&A**

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12:30 – 13:30 **LUNCH**

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13:30 – 14:15 **Session 5**

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13:30 – 14:00 **Operational Prospects for Implementation: A Tactical Reflection**

*Dr Beverly Damonse, Group Executive, Science Advancement, (NRF).*

After extensive consultation and several draft preparations, the Department of Science and Technology's Science Engagement Framework was finally approved in December 2014. This document provides an overarching strategic framework to advance science engagement in South Africa. It is intended to improve coordination of and encourage science promotion, communication and engagement activities across the Department, its entities, universities, other Government departments and science councils, museums, and partners outside the public sector. Furthermore, the Framework recognises key enablers of successful implementation, which include: (a) an effective coordination function to promote and ensure strategic and operational alignment of science engagement initiatives across a wide range of stakeholders; (b) an enabling regulatory framework; (c) funding to broaden the scope and scale of the DST's current science engagement portfolio; and (d) a science engagement information management system. Tales of mismatch between policy (strategic) implementation and situated practice abound within the policy field, and especially in areas such as educational change. As officials, entities and communities generally develop responses to new policies or strategic directions, implementation issues are usually revealed in all their complexity, intractability and inevitably. This session will thus provide a tactical reflection on operational prospects for implementation of the Science Engagement Framework, with the understanding that the connections between policy and practice ultimately will be made or missed in the science engagement professional communities (researchers, science communicators, science centres, educators, learners etc.).

14:00 – 14:15 **Q&A**

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14:15 – 15:30 **Session 6**

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14:15 – 14:45 **Science and the South African media: challenges and opportunities for engagement**

*Dr Michael Gastrow, Senior Research Specialist, ESD, HSRC*

The media, including the news media and online social media, are important mediators between the institutions of science and the broader public. Extant research highlights some of the complexities of this relationship. The South African news media have low levels of science journalism capacity, and editorial structures rarely include dedicated science news apparatus. The news value of science is perceived to be low, although this varies across publications. This generally results in relatively low levels of news coverage of science stories in comparison to the domains of politics, sport, business, and the arts. However, there are some exceptions to these trends that highlight opportunities for improvement. Publications that host dedicated science journalists, and those that include editorial structures for science news, show higher levels of science news outputs. Some science news stories, for example that of the Square Kilometre Array (SKA) telescope, have received substantial media coverage. We consider the application of these findings for the implementation of the Science Engagement Framework, drawing on the case of the SKA to illustrate drivers and mechanisms for successful science engagement.

14:45 – 15:00 **Q&A**

15:00 – 15:45 **Discussion and the way forward: reflections on the role of the social sciences in science engagement**

*Prof Michael Kahn, University of Stellenbosch*

15:45 – 15:55 **Closure**

*Dr Vijay Reddy, Executive Director, ESD, HSRC*

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Departure

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## **WORKSHOP DOCUMENTS**

On registering, delegates will be provided with supporting documentation at the workshop in their workshop packs, including the workshop programme, abstracts and biographies.

## **REGISTRATION**

The Registration Desk for the workshop will be located in the Foyer of the Amethyst Room in the CSIR Conference Centre

Registration commences at 8h00 on 10 March 2015. On arrival, delegates and guests should register and collect their workshop bags from the registration desk. The Registration Desk will be open for general information enquiries throughout the workshop.

## **PRESENTATIONS**

All presenters must please see that their PowerPoint slides are loaded onto the computer systems in advance of their session. IT staff that will be assisting at the event include Mr Thabo Stamper (cell: 076 628 3579, E-mail: TStamper@hsrc.ac.za).

Should you have any additional material you would like to make available to delegates, please bring along around 65 copies to provide delegates.

A printer will be available, but only for a limited number of copies

## **INTERNET ACCESS AND COMMUNICATION FACILITIES**

Internet access is available in the CSIR Conference Centre

Please note that it is not possible to provide a sufficient number of computers and work stations to cater for everyone expected to join us. We therefore recommend that you bring along your own laptop.

## **THE WEATHER**

March season is usually good weather in Pretoria. You may expect average temperatures of 23° C to 34° C during your visit in Pretoria, usually with cool evenings. **We highly recommend that delegates bring along umbrellas.**

For more accurate information, visit the South African Weather Bureau's website:

<http://www.weathersa.co.za>.

## **EXHIBITIONS**

Please support the exhibitors in the foyer of the Amethyst, where HSRC Press books will be available to view.

## **PARKING**

Parking is available for delegates using their own transport

#### KEY CONTACTS DETAILS FOR YOUR VISIT

Events manager: <b>Ms Arlene Grossberg</b> , Tel 012 302 2811, Cell: 078 168 2996, E-mail: <a href="mailto:acgrossberg@hsrc.ac.za">acgrossberg@hsrc.ac.za</a>
IT: <b>Mr Thabo Stamper</b> cell: 083 993 6657
Registration desk: <b>Ms Happy Solomon</b> 073 553 2930, E-mail: <a href="mailto:HSolomon@hsrc.ac.za">HSolomon@hsrc.ac.za</a>
Travel and accommodation: <b>Rahab Singwane</b> Travel Director: Travel Adventures International Email: <a href="mailto:rahab@travadv.co.za">rahab@travadv.co.za</a> Cell: 082 593 4385 Fax: 086 680 0352 Tel: +27 (0) 12 460 7421 Our After Hours Number 082 419 6661 Docex 293, Pretoria
CSIR Event Coordinator: Pleasure Ntsime, Tel: 012 841 3822, E-mail: <a href="mailto:PNtsime@csir.co.za">PNtsime@csir.co.za</a>

#### Have we forgotten something?

Please do not hesitate to get in touch if you have any questions or need further information about your trip

We look forward to seeing you soon!

We hope that you have an enjoyable and successful workshop.

ADDENDUM A

Meiring Naude Road, Brummeria, Pretoria | PO Box 395, Pretoria, 0001

Tel: +27 12 841 3884 | Fax: +27 12 841 2051

E-mail: [icc@csir.co.za](mailto:icc@csir.co.za) | Web: [www.csiricc.co.za](http://www.csiricc.co.za)

DIRECTIONS TO THE CSIR CONFERENCE CENTRE

LOCATION MAP



**Directions from North  
(travelling on N1 South)**

Take N1 South  
Take the Lynnwood Road turnoff  
and turn left into Meiring Naude Road  
Cross over one set of  
traffic lights (Kings Highway)  
Turn right into the first entrance,  
which is the CSIR south gate  
Keep left and follow the signs to  
the CSIR International Convention Centre

**Directions from South  
(travelling on N1 North)**

Take N1 North  
Take Lynnwood Road offramp  
after Atterbury Road  
Turn right over highway  
Turn left into 1st street  
(Meiring Naude Road)  
Cross over two set of  
traffic lights (Kings Highway)  
Turn right at the next set of traffic lights,  
which is the CSIR south gate  
Keep left and follow the signs to  
the CSIR International Convention Centre

**CSIR** International  
Convention Centre  
*naturally hospitable • globally accessible*

location map

expect service