

SCIENCE AND THE PUBLIC: building trust for development

The discipline and practice of an area called science communication has become increasingly important for development. *Ina van der Linde* explores.

During the night of 6 April 2009 an earthquake with a magnitude of 6.3 struck the small town of L'Aquila in Italy, killing 309 people. The earthquake came after four months of continuous seismic activity.

In an area that is prone to earthquakes this event was neither unusual nor unexpected. What was unusual, though, was the subsequent actions by prosecutors backed by the population of this small town. They took six scientists, who they claimed had underplayed the danger of the possibility of such a massive earthquake, to court.

What followed was a 13-month trial, and on 22 October, six scientists and one government official were found guilty of manslaughter and sentenced to six years in prison. The verdict was based on how the scientists evaluated and communicated risk before the earthquake that hit the city.

This verdict has sent shock waves through the scientific community worldwide, who called the decision 'bizarre', stating that the risk of litigation will deter scientists from advising governments and, in this case, working in seismology and risk assessments.

But the verdict also has consequences for the relationship of trust between scientists and the public, as well as for researchers and communicators working in the area of Science Communication (SC) and its protégé, the Public Understanding of Science (PUS).

Scientific culture is a society-wide environment that appreciates and supports science and scientific literacy.

Why was this event important for SC?

One of the guiding principles in SC is to provide the public with '... effective communication of science (that) gives people accurate information upon which to base decisions. By making science accessible, science communicators help counter the misinformation and misconceptions which clutter public debate,' says Jessie Shoec, National President of the Australian Science Communicators.

In the case of the six scientists from Italy, the townsfolk of L'Aquila felt the communication between scientists and the public was deficient and the information misleading, thereby causing preventable suffering.

SC and the case for development

Trust between science and technology and the public is even more important in the developing world. As David Dickson, editor and founding director of www.SciDevNet, states: 'The biggest single factor determining any country's potential for achieving sustainable social and economic growth – and particularly in the case of developing countries to attaining the Millennium Development Goals – is its ability to access and apply the fruits of modern science and technology in a responsible manner.'

Achieving this goal is more complex than it sounds, says Dickson. There are many political and economic obstacles to accessing science and technology, ranging from high costs to a lack of absorptive capacity.

Achieving this access in a responsible manner, for example ensuring that it reduces rather than increases the gap between rich and poor, presents its own problems, particularly where much scientific knowledge comes wrapped as privately-owned intellectual property.

'And even where access is achieved, using science and technology effectively to meet local needs in a way that is appropriate to local conditions remains a challenge, particularly when supply is dominated by commercial considerations,' he says.

In reference to the devastating events at L'Aquila, Dickson's opinion becomes even more telling: we live in a world where almost every social need – from food security through good health to productive employment – increasingly depends on some form of science-based technology. Not only is it necessary to help developing countries to develop their own capacity to use science and technology but appropriate information is a global necessity.

Science communication and building trust between scientists and the public

Science communication was globally established as a field of study and practice some 30 years ago. This field of study is currently gaining momentum across the world, and recently also in South Africa. It is propelled forward by an enthusiastic global group of social and natural scientists and communications professionals who believe in the communication of science and technology for development. This group is progressively participating in collaborations towards linking the opinions and findings between the so-called developed and developing countries.

Dr Terry Burns, University of Newcastle, New South Wales and colleagues, states that 'science communication (SciCom) is not simply encouraging scientists to talk more about their work, nor is it an offshoot of the discipline of communications'. It involves several well-defined fields, each with a specific focus on an aspect of communicating science. Such concepts include public awareness of science (PAS), public understanding of science (PUS), scientific culture (SC) also known as 'scientific temper', and scientific literacy (SL).

- Public awareness of science aims to stimulate awareness of, and positive attitudes (or opinions) towards science.
- Public understanding of science, as the name suggests, focuses on understanding science: its content, processes, and social factors.

By making science accessible, science communicators help counter the misinformation and misconceptions which clutter public debate. Jesse Shore.



Minuscule technology – visitors to the CSIR's Centre for Nano (a prefix used in the metric systems, meaning a billionth, denoting a factor of 10⁻⁹ or 0.000000001), organised by the South African Agency for Science Advancement (SAASTA). Photo with permission from SAASTA.

- Scientific literacy is the ideal situation where people are *aware of, interested and involved in, form opinions about, and seek to understand science.*
- Scientific culture is a society-wide environment that appreciates and supports science and scientific literacy. It has important *social and aesthetic* (affective) aspects.

Recently these fields have also branched out into what we call a 'transdisciplinary' approach to research, says Dr Hester du Plessis, newly appointed head of science communication at the Human Sciences Research Council (HSRC).

'The growing awareness of the complex relation between science and society and the scientific impact on the application of our daily common sense activities (including those of indigenous knowledge systems) is gaining attention during the growing interaction between researchers from the west and those from developing countries,' Du Plessis maintains.

Trying to define 'transdisciplinarity' is more complicated. Helga Nowotny, President of the European Research Council, says: 'Transdisciplinarity responds to an underlying need to regain the loss in what is felt to have been a former unity of knowledge of all disciplines; and an inherent belief that transdisciplinarity contributes to joint problem solving.

'It is more than juxtaposition, more than laying one discipline alongside another'. If joint problem solving is the aim, then the means must provide for an integration of perspectives in the identification, formulation and resolution of what has to become a shared problem. It integrates disciplines and treats them as complementary, converging to understand a problem holistically without losing their identities.

A current collaborative project at the Research use and Impact Assessment (RIA) unit at the HSRC looks at the concept

and application of transdisciplinarity in partnership with the Mapungubwe Institute for Strategic Reflection (MISTRA). The project studies various institutions and cross-examines the application of transdisciplinarity on both institutional and academic level.

The long-term aim of this project is to make room for the production of new knowledge that is appropriate for Africa's future intellectual development. The team members are seeking evidence that a transdisciplinary approach to research will assist in remodelling South Africa's political and socio-economic inheritance.

This quest is already bearing fruit. One interesting example is illustrated in the next article by research done by Professor Himla Soondyal and her team of researchers on genetics and tracing our ancestors.

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