

296. National Strategies for Science Communication: Comparing International Approaches

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Abstract. This paper presents four contrasting national strategies for science communication, representing Australia, China, the United Kingdom and India (the last of which is still under development). The three published strategies all involved broader consultations as well as government and high-level strategic input in their development. All the strategies focused on both public and policy-related audiences, and shared many common action points such as providing training and improving the infrastructure and sharing of resources for science communication. There were however some differences in their scope and focus, mainly arising as a result of economic, cultural and social differences between the countries.

Keywords: National strategy, China, Australia, UK, India

Introduction

As the benefits of science communication have become more apparent, governments around the world have begun to implement processes to develop far-reaching national strategies for embedding science communication into wider practice. There are often similarities in the challenges being addressed by different countries, for example decreasing interest in science within the population (especially for pursuing a scientific career) and reduced funding for scientific research. These issues are particularly apparent in the USA, the UK and parts of Europe in recent times, with reduced funding partly due to economic downturn in those regions, whilst other countries (such as China and Australia) have seen a surge in science-related R&D investment by central governments. The approaches taken by different countries therefore often differ in their scope and implementation, reflecting both national cultural differences as well as potentially different science communication ideologies.

This paper briefly compares the strategies implemented by four contrasting countries: China, Australia, the United Kingdom and India. Each national strategy is briefly introduced, followed by a comparison and analysis of the key similarities and differences between the four strategies.

China

The National Scheme of Scientific Literacy for All1 was launched in 2006, as a long-term strategic action plan to make China into an innovation-driven country. In order to realize its objectives, the State Council asks government at different levels to raise their inputs and provide policy support on: 1) science education and training, 2) scientific

museums and related facilities, 3) resource-development for science communication, and 4) capacity-building of science communication by mass media. The implementation of the Scheme relies on an alliance of ministries, academies, as well as non-governmental organizations during the last five years.

Australia

The Inspiring Australia² report proposes a national strategy for public engagement within Australia that will help realise government goals related to innovation and scientific development. The strategy encompasses a more coordinated approach to communicating the sciences across the country, and was developed through a series of national consultations with a wide range of science communicators, educators, journalists and scientists in all states and territories.

United Kingdom

Following a consultation on Science and Society, the UK Government set up the Science for All Expert Group to develop a national Action Plan³. Three challenges were identified: gaining a wider understanding of why, when and how the public engages with the sciences; developing supportive networks and mechanisms for increasing effective engagement; and encouraging a professional culture that values, recognises and supports public engagement. Many organisations are committed to deliver the plan together, working informally and with Government support.

India

The first Prime Minister of India, Pandit Jawahar Lal Nehru presented the Scientific Policy Resolution on March 4, 1958, which has been a guiding factor for development of science and technology in the country. Special attention was given to the scientific approach and communication in the resolution, which has been a basis for various policy and strategy documents since. For example in 2003 the government of India announced a comprehensive Science and Technology Policy 2003 that carried a section on 'Public Awareness of Science and Technology. However to date there is not a single defined strategy for the entire country. The NCSTC (National Council for Science & Technology Communication) is currently under way for formulation of a document.

Comparison and Analysis

Taking the four national approaches outlined above, a brief synopsis of their key elements is provided below. For ease of comparison this has been broken down into four fundamental areas: the motivations behind the development of the respective strategies (including their stated objectives); what processes were involved in their development and how far they have progressed in their delivery to date; who the priority target audiences are within each country; and finally a comparative analysis of the scope of the action points and/or recommendations contained within each strategy.

Motivations and objectives

All four countries demonstrate a consistent desire to improve both levels of recruitment ('capacity building') and the skills of those recruited to science and technology (S&T) roles. Within certain countries (e.g. Australia) there is explicit recognition that without wider acceptance of S&T amongst public groups (not just those who become scientists) this recruitment will not be possible, although this is implicitly recognised within other strategies also. The Australian and Chinese governments have both identified clear priorities relating to driving 'innovation' within their countries, which also comes into play in their science communication strategies. In addition to the 'public' oriented audiences, the Australian approach also aims to achieve improved links to policy, and an 'open relationship' between science and society. China also includes policy makers and public servants as a key focus (see 'Target Audiences' below). In the UK the orientation is further extended to recognising the potential impacts on the researchers involved in science communication – that there are benefits to science as well as society – and a key focus is to 'ensure that public perspectives are sought, recognised and responded to by the scientific and policy committees'.

One interesting area of contrast is the different definitions and language used within the respective strategies. In particular, both Australia and the UK use very broad definitions of 'science', for example in the UK this is stated as 'encompassing research and practice in the physical, biological, engineering, mathematical, health and medical, natural and social disciplines, and research in the arts and humanities'. Whilst most of the other strategies talk about 'science communication' or 'science engagement', the Chinese strategy refers explicitly to 'science popularization' - a historically preferable phrase in China referring to the prevailing cluster of concepts such as science communication, PUS (public understanding of science), scientific culture, etc. In the UK, the term 'public engagement' has largely

taken over. It is seen to include ideas of science communication and public understanding but additionally covers a wider range of purposes and types of activity between scientists, policy makers and the public.

The stated objectives within each national strategy reflect strongly on cultural and social norms within the country in question. For example, in China efforts to improve scientific literacy take advantage of the lead role played by the government, aiming to ‘promote a full-fledged economic, social, human development, to improve China’s independent innovation capacity and overall national strength, and to create a solid workforce foundation for building a moderately prosperous society’. In the UK, where government is less central to everyday life, there is a stated intention to ‘deliver a shift in cultural awareness, recognition and support for science’. The focus is on improving the cultural role of science rather than how well it is understood by public groups. In contrast, in India, where average GDP is much lower, and more basic needs come into play, the focus of the strategy currently being devised is towards the ‘improved wellbeing of citizens and saving and shaping their lives’.

Development and current status

In line with existing good practice within the field, all three of the existing strategies have combined a central ‘Expert Group’ (UK) or high level steering committee (Australia and China) with some form of wider consultation with key stakeholders in order to ensure that the resulting strategies were relevant and useful to the people they would impact upon. In most countries there has also been recognition of the importance of research evidence.

The approach in China represents the current phase in a series of schemes to improve S&T popularization. The process of producing the policy was carefully designed, starting with small group studies of a dozen focused topics bonded in a package. Rounds of consultative discussions and seminars were then organized to produce the final version. The Scheme is designed to be completed in two phases, the first from 2006 to 2010 and the second from 2010 to 2020. Specific goals are set respectively as short-term and long-term perspectives.

In Australia the impetus was provided by a recent (2009) 25% increase in spending by the Australian Government on science. This increased focus led to recognition of the need for the development of a national communication strategy. The steering committee contained representatives from the media, Questacon (Australia’s national science and technology centre), government-funded research organisations, the Office of the Chief Scientist and the relevant government department. More than 230 people were involved in the wider consultation, including science communicators, educators, journalists and scientists in all states and territories. Since the release of the Inspiring Australia report, the Australian Government has committed to implementing the strategy contained therein, and initial planning is underway for implementation including the development of a framework of principles of science communication initiatives, establishment of coordinating groups and networks and progress on campaign branding.

In the UK the strategy development took the form of a major public consultation on Science and Society by the Government, one result of which was the setting up of the aforementioned Expert Group to coordinate a coherent national approach to resolving the issues identified in the consultation as well as celebrate and disseminate recognised successes. Separate groups were set up to investigate ‘Science and the Media’, ‘Science and Trust’, ‘Science and Learning’ and ‘Science for Careers’ in addition to the ‘Science for All’ group which produced the Action Plan described here. Since the Action Plan was published a follow-up group has been established to further progress the identified action points, with regular public updates as the work continues.

Although not yet in a publicly accessible form, the Indian approach differs most significantly through its focus on field projects involving people on the street and grass-root level. The thrust in early post-independence India was on scientific temper and science education, formal and informal and science communication was mainly centered on publication of books and magazines, etc. The interest was triggered generally in the 60s and 70s in agriculture, space and programmes on the radio began because of the green revolution and space expeditions. The decades of the 80s and 90s witnessed a shift from indoor communication to outdoor science communication channels, such as Vigyan Jatha and use of folk media. This grass-root focus is continuing in the current developments of a national Indian strategy.

Target audiences Only the Chinese Scheme identifies explicit target audiences to date, although the intended recipients may be

readily inferred from the strategies outlined within the other countries. Within China the focus is on improving the scientific literacy within the following four groups:

- Young people
- Farmers
- Working population in urban areas

- Leaders and public servants

The first group clearly links into the focus on recruitment and capacity building, and is shared amongst all four nations. ‘Farmers’ and ‘working populations in urban areas’ are more unique to the Chinese cultural situation, since there are distinct differences in scientific literacy between urban and rural populations which are less apparent in other countries. Farmers in particular are identified as a key group due to their potential role in ‘ecological environmental protection, water resources efficiency, cropland protection, disaster prevention and preparedness, healthy lifestyle, eliminating bad habits, and opposing foolish superstitions’. The intentions relating to improving farmers’ scientific literacy are threefold: personal improvements (such as increased yields and incomes, improved lifestyles, and skills development); better employability of labour transfer to non-agricultural sectors or cities and towns; and raised scientific and cultural literacy for women in the rural areas and for farmers in certain strategic regions of lower development and ethnic autonomy.

The final group – leaders and public servants – is recognised in all three existing strategies, and potentially reflects increasing concerns regarding the scientific literacy of policymakers more broadly. Somewhat more cynically, it may also be a reflection of the government interest in the development of all three strategies – government departments relating to science and technology will of course want their colleagues in other departments to value and respect their work. One of the five key themes within the Inspiring Australia report is ‘National Leadership’, recognising the crucial role that leaders both within and external to the science communication can play in this regard. Within the UK a specific action relates to promoting ‘successful knowledge exchange between the sciences, policy and business’. Within China the inclusion of policy leaders as an audience has already borne fruit, with more money being put into the popularization of S&T since the development of the Scheme. Industrial organisations and businesses are recognised as potentially very relevant partners however work within some countries has demonstrated that they are less visibly engaged in science communication than academia and the public and cultural sectors, focusing instead on activities which target young people directly (education, skills development and recruitment).

There is also a clear intention to improve audience diversity and widen the reach of science communication activities to less traditional audiences. In the UK the very name of the Expert Group – ‘Science for All’ – reflects this focus, and the other reports make similar mention of improving accessibility for under-represented groups within science, for example indigenous and rural communities.

Scope and focus

Each of the three published national strategies has been broken down into key areas of focus, with various action points recognised within each area. In the Chinese approach four ‘action plans’ have been identified, each relating to different aspects of improving the popularization of science and technology (PST):

- Science and education training
- Developing and sharing PST resources
- PST related infrastructures
- Capacity-building of science communication by mass media

Beneath each of these plans lies a subset of ‘missions’ and agreed targets.

By contrast, in Australia there are 15 ‘principles and recommendations’ supporting five key themes:

- National leadership
- Telling the Australian science story
- Engaging all Australians
- Building Australia’s capacity
- Mobilising Capability

In the United Kingdom there are 19 broad objectives which have been identified, with 60 specific actions or recommendations to help achieve them. The UK Action Plan is set out against three key challenges identified by the Science for All Group:

- A wider understanding of why, when and how the public engages with the sciences
- Supportive networks and mechanisms for increasing effective engagement
- A professional culture that values, recognises and supports public engagement with the sciences.

The respective plans share much in common with regards to specific recognised actions. The sharing of resources is a common theme, for example the development of an online ‘collective memory’ to share learning from evaluations of public engagement in the UK. Similarly, all three countries refer to improving infrastructures for science communication, although the focus in each case depends on the maturity and scale of the field in each country. In

China and Australia the intention is to improve and/or create an appropriate national infrastructure, whereas in the UK the initial challenge is to better map the existing infrastructures that support public engagement. This is in part related to the wider existing infrastructures in each country – in Australia for example there are Local, State or Territory and Federal governments, each with different responsibilities relating to education, training, and science support. The development of a national infrastructure therefore needs to recognise government priorities at other levels.

Training is also an area that appears in all three published plans, although the audience and focus for the training does differ. In China this refers to education and science training for their four identified target audiences, whereas in Australia the focus is on ‘communication training’ (especially media training) for researchers and others associated with scientific research. In the UK there is recognition of the ‘field’ of science communication and the need to provide appropriate professional development of scientists and the increasing group of people working as professional science communicators. Further to this, the need for reward and recognition of researchers involved in science communication is highly visible within both the UK and the Australian strategies, including developing a ‘Concordat for Public Engagement’ by research funders in the UK to provide clear expectations as to their responsibilities in this area. The three countries also recognise the importance of research and evaluation in science communication, emphasising the importance of building their strategies on a clear evidence base.

The mass media are an explicit focus within both the Australian and Chinese strategies, and the UK addressed this through its ‘Science and Media’ report and action plan. Both Australia and the UK make mention of online and social media as opportunities for development, reflecting the high uptake of the Internet as a communication medium in those countries.

The main difference in approach between the three published strategies relates to their over-arching role: within both China and Australia there is a focus on branding and public campaigning as well as providing an over-arching strategy for national action. This focus potentially relates to an increased role relating to the marketing or publicity of science and technology to the various target audiences. In contrast, within the UK the strategy focuses on the development of a culture of public engagement and a recognition that there are many different and equally valid purposes and types of engagement. Indeed, one interesting piece of work being carried out in the UK by the Science for All Follow-up Group is the development of a simple tool to make explicit the different purposes and types of public engagement, so that individuals or organisations planning activities can place their objectives and plans in a wider context. There is also a recognition of the benefits to those involved in public engagement (as well as to public groups) within the UK strategy which are not made explicit elsewhere. Neither of these approaches is necessarily better than the other, but are likely to be due to cultural and ideological differences in the respective countries.

Conclusions

The four countries represented here – China, Australia, the United Kingdom and India – represent a wide variety of cultural and social perspectives. Their national strategies therefore contain key differences in order to reflect the priorities and needs of their populations. The test of the value of the different strategies will of course be in how well they succeed in achieving their respective stated aims. China is already five years into the implementation of its Scheme, however the UK is less than a year into its implementation phase. Australia has only recently received government approval to go ahead with the proposed strategy but will be entering its implementation phase within the next six months. India’s strategy is still in formal development but is built on a long-standing commitment to policy in this area. With all four nations emphasising the importance of research and evidence-based development of their strategies this is certainly an interesting time to monitor and compare different national approaches.

References

- [1] The English version of the Outline of the National Scheme for Scientific Literacy is available at: <http://www.kxsz.org.cn/english.html>
 - [2] A PDF copy of the full Inspiring Australia report and strategy is available at: <http://www.innovation.gov.au/General/Corp-MC/Documents/InspiringAustraliaReport.pdf> The appendices are a rich source of information additional to the key recommendation details. In particular, Appendix 7 is a very useful snapshot of relevant Australian and international reports.
 - [3] The Science for All Action Plan and supporting documents may be downloaded from <http://interactive.bis.gov.uk/scienceandsociety/site/all/2010/02/09/science-for-all-report-and-supporting-documents/>
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