

# PS PUBLIC SERVICE REVIEW

European Science & Technology 12

an independent review

**003 Dieter Imboden**  
on the importance of  
collaboration and cooperation

**176 Janez Potočnik**  
on resource efficiency  
across Europe

**234 John Dalli**  
discusses the value of  
e-health technologies

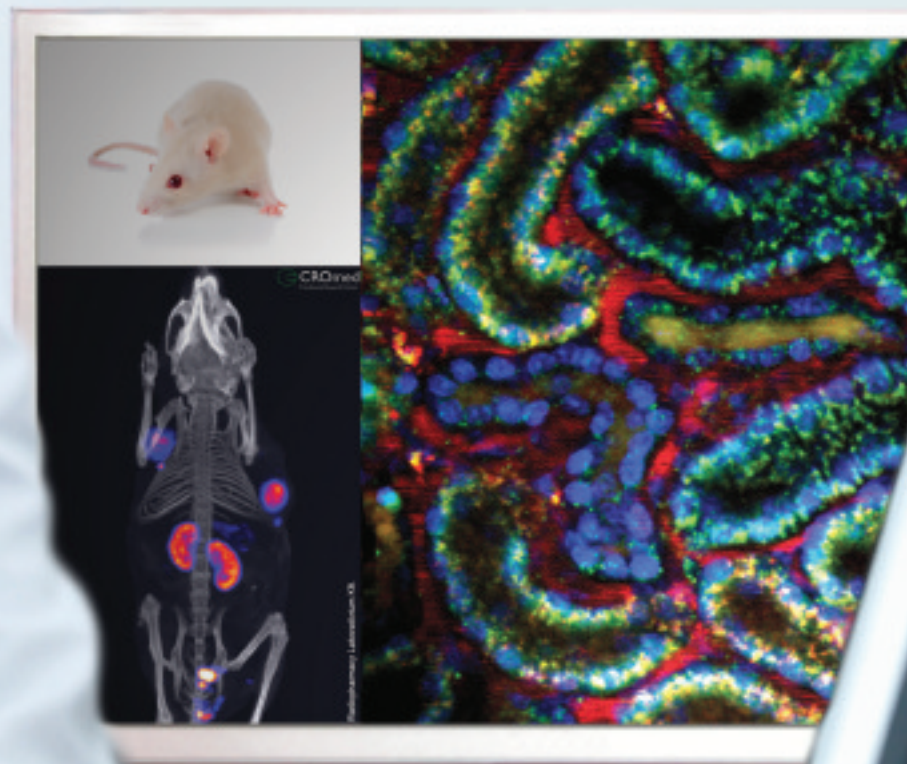
**114 Semmelweis University**  
a new dynamic imaging  
modality making diagnostic  
assessments safer

**auril**  
Association for University  
Research and Industry Links

**ikt** INSTITUTE OF  
INTEGRATED KNOWLEDGE TRANSFER

## More than meets the eye

A closer look at visual technologies  
in healthcare



cover inspired by



Semmelweis University, Budapest

**PS**

analysis • opinion • debate

# CONTENTS

**Dieter Imboden, President of the Research Council of the Swiss National Science Foundation, and President of EUROHORCs, the association of heads of European Research Organisations . . . 3**

**Amy Caddick, Editor . . . . . 4**

**What role should government and scientists take in the study of natural disasters? . . . . . 9**

**Helping the little guy . . . . . 14**

Alessandro Barberis, President of EUROCHAMBRES, urges the EU to enable Europe's small and medium-sized enterprises to flourish for the good of the continent

**Thinking small . . . . . 16**

If they are backed by solid legislation, SMEs can drive Europe's growth, suggests Andrea Benassi, Secretary General of the UEAPME

**The EU's got talent . . . . . 18**

Androulla Vassiliou, European Commissioner for Education, Culture, Multilingualism and Youth, details how the EC budget will support Europe's brightest young minds

**A valuable lesson . . . . . 22**

Lefj Moos et al, of EERA, underline the importance of education research in addressing the challenges facing Europe

**Back to school . . . . . 24**

Irish Minister for Education and Skills Ruairi Quinn tells *Public Service Review* about the government's ambition to use science education to build a knowledge economy

**The social consciousness . . . . . 29**

*Public Service Review* asks Françoise Caillods, Senior Adviser to the ISSC, about the impact that social science research is having on the global stage

**An area of need . . . . . 36**

Professor Dr Andreas Eckert, of the IGK Institute, tracks the chequered history – and bright future – of area studies

**Just the job . . . . . 38**

Editor Amy Caddick outlines European Commissioner for Employment, Social Affairs and Inclusion László Andor's solution for tackling youth unemployment

**Common goals . . . . . 45**

Creating a Common European Asylum System has been a long and complex process, as *Public Service Review* investigates

## RESEARCH

**Programmed for change . . . . . 48**

Experts discuss the significant progress made in the field of artificial intelligence research, and its potential to change lives

**A new Horizon . . . . . 53**

Simplified, bottom-up, collaborative research is a key factor in Europe's innovation drive, writes COST Office Director Dr Monica Dietl

**Reaching to the regions . . . . . 59**

Working together on a regional level can make a tangible impact on Europe's growth, explains Michel Lamblin, Programme Director of INTERREG IVC

**Going nuclear . . . . . 60**

Professor Dr Patrick Bourguet, President of the EANM, champions the strengths and potential of the underdeveloped field of nuclear medicine

**Better connected . . . . . 64**

European cooperation is vital in embracing the benefits of a new scientific era, believes Professor Marja Makarow, Chief Executive of the European Science Foundation

**Keeping pace with promise . . . . . 68**

*Public Service Review* examines how the European Research Council is promoting excellence in the scientific innovation pivotal to progress in Europe

**Challenge Austria . . . . . 72**

Dr Hannes Androsch, Chairman of the Austrian Council for Research and Technology Development, looks at how Austria can become an innovation leader

**The rules of attraction . . . . . 76**

Anders Geertsen, Director General of the Danish Agency for International Education, talks to *Public Service Review* about encouraging the brightest minds to study in Denmark

**Schooling Denmark . . . . . 79**

Troels Lund Poulsen, Denmark's new Minister for Education, has high hopes for the country's already thriving education system, as *Public Service Review* explores

**Keeping Danes in the game . . . . . 86**

Charlotte Rønne, Research Director at the Confederation of Danish Industry, considers the way forward for RDI policy in Denmark and beyond

FOREWORD 3

INTRODUCTION 4

DIGEST 9

ENTERPRISE AND INDUSTRY 14

EDUCATION 18

SOCIAL SCIENCES 29

SPECIAL FEATURE: ARTIFICIAL INTELLIGENCE 48

OVERVIEW 53

NATIONAL PERSPECTIVES 72

AUSTRIA

DENMARK

FINLAND	<b>Greater expectations</b> . . . . .	<b>90</b>	
	Minister Jukka Gustafsson explains how the Finnish higher education and research system is undergoing reform with a strategy based on knowledge and competence		
	GERMANY	<b>Leaders of the pack</b> . . . . .	<b>96</b>
		Editor Amy Caddick asks Dr Jörg Hacker, President of the German National Academy of Sciences Leopoldina, why his country has seen such success in research	
		<b>The cutting edge of creativity</b> . . . . .	<b>108</b>
	Professor Dr Hans-Jörg Bullinger, President of the Fraunhofer-Gesellschaft, highlights the importance of networking in Europe's drive for innovation		
	HUNGARY	<b>Hungary to succeed</b> . . . . .	<b>116</b>
		Hungarian Minister of State for Education Rózsa Hoffmann provides insight into changes being made to higher education in the country in order to remain globally competitive	
	ITALY	<b>A new frontier</b> . . . . .	<b>119</b>
		Professor Fabrizio Pirri, of the Politecnico di Torino, takes a closer look at the potentially revolutionary role of nanotechnologies in cancer research	
<b>Doesn't add up</b> . . . . .		<b>120</b>	
Mathematicians do not understand why European funding for their discipline is so poor, says Professor Michiel Bertsch, of the Italian National Research Council			
NETHERLANDS	<b>Upwardly mobile</b> . . . . .	<b>122</b>	
	Dr Fernando Quevedo, Director of The Abdus Salam ICTP, charts the emergence of m-science in developing countries and around the world		
	<b>Dutch courage</b> . . . . .	<b>124</b>	
Professor Robbert Dijkgraaf, President of KNAW, reflects on the changes required for the Netherlands to maximise its potential in research and development			
NORWAY	<b>Well-schooled?</b> . . . . .	<b>126</b>	
	Higher education in Norway has a fine reputation, but the quest to improve standards further is unceasing, as UEN Special Advisor Tove Hauge tells <i>Public Service Review</i>		
	<b>A foreign exchange</b> . . . . .	<b>131</b>	
<i>Public Service Review</i> profiles Jonas Gahr Støre, Norway's Minister of Foreign Affairs, a firm believer in the bond between cooperation in science and international diplomacy			
SPAIN	<b>The age of excellence</b> . . . . .	<b>134</b>	
	Jaume Bertranpetit, of the Catalan Institute for Research and Advanced Studies, reveals to <i>Public Service Review</i> how Catalonia is committed to first-class science		
	<b>Viva España</b> . . . . .	<b>136</b>	
Minister for Science and Innovation Cristina Garmendia hopes to usher in a golden age for Spanish R&D, as Editor Amy Caddick details			
SWEDEN	<b>Educate to elevate</b> . . . . .	<b>146</b>	
	Gudrun Paulsdottir, President of the European Association for International Education, explores the importance of higher education in Sweden and how output can be maximised		
152	<b>GLOBAL PERSPECTIVES</b>		
AUSTRALIA	<b>Aiming high down under</b> . . . . .	<b>152</b>	
	Graham Durant, Director of Questacon, turns the spotlight on ongoing efforts towards bolstering science engagement in Australia		
CANADA	<b>Can-do Canada</b> . . . . .	<b>154</b>	
	The Canadian Government is dedicated to building a genuine knowledge-based economy, says Minister of State for Science and Technology Gary Goodyear		
	<b>The Collider's scope</b> . . . . .	<b>158</b>	
The Large Hadron Collider at CERN provides an apt example of global science in action, writes Dr Tim Meyer, of TRIUMF			

**SPACE**

<b>Back to earth</b> . . . . .	<b>161</b>
Professor Walter Peeters, Dean of the International Space University, analyses the ways in which scientific fields have benefited directly from humankind's forays into space	
<b>Questions of space</b> . . . . .	<b>163</b>
<i>Public Service Review's</i> James Morgan speaks to Professor Johann-Dietrich Wörner, Chairman of the DLR, about Germany's role in contemporary space research	

<b>Beneath the ice</b> . . . . .	<b>166</b>
A panel of experts shed light on the role of scientific research in Arctic affairs	
<b>The search for understanding</b> . . . . .	<b>171</b>
In the wake of a spate of recent natural disasters, <i>Public Service Review</i> explores the importance of collaboration in earth science research	
<b>Steps to sustainability</b> . . . . .	<b>176</b>
The EU's Roadmap on Resource Efficiency sets out vital tasks for ensuring a sustainable future, says Janez Potočnik, European Commissioner for the Environment	
<b>A resource action</b> . . . . .	<b>182</b>
Jeremy Wates, Secretary General of the European Environmental Bureau, outlines the direction that he believes a European policy on resources and sustainability must take	
<b>Mapping out the future</b> . . . . .	<b>184</b>
European Commissioner for Climate Action Connie Hedegaard talks to <i>Public Service Review</i> about Europe's need to develop a low-carbon economy	
<b>Through a green lens</b> . . . . .	<b>186</b>
Helen Mountford, the OECD's Deputy Director for the Environment, underlines the benefits of green growth and the conditions needed for it to take root	
<b>An act of nature</b> . . . . .	<b>188</b>
Biodiversity is a precious commodity and must be rigorously protected, advocates Norway's Minister of the Environment Erik Solheim	
<b>A walk on the wild side</b> . . . . .	<b>191</b>
Establishing a wildlife culture could offer a viable alternative to agriculture in rural areas, argues Professor Torstein Storaas, of Hedmark University College	
<b>The Swedes' sixteen</b> . . . . .	<b>192</b>
Eva Thörnclöf, of the Swedish Environmental Protection Agency, discusses with Editor Amy Caddick the 16 objectives guiding Sweden's fight for a better environment	
<b>Yielding results</b> . . . . .	<b>196</b>
José Manuel Silva Rodríguez, EC Director-General for Agriculture and Rural Development, stresses the importance of boosting Europe's agricultural sector	
<b>If the CAP fits...</b> . . . . .	<b>203</b>
Pekka Pesonen, Secretary General of Copa-Cogeca, highlights concerns about the introduction of more costly regulations for EU farmers	
<b>A KIC-start</b> . . . . .	<b>204</b>
Maria Olofsdotter, Project Leader at Foodbest, explains why a Knowledge and Information Community would be invaluable for Europe's food sector	
<b>A monumental effort</b> . . . . .	<b>206</b>
Danish Culture Minister Per Stig Møller champions increased community involvement in preserving and maintaining national heritage sites	
<b>Europe in motion</b> . . . . .	<b>212</b>
CEMR Secretary General Frédéric Vallier notes the varied and complex ways in which mobility policies are central to the wellbeing of European citizens	
<b>Drivers of change</b> . . . . .	<b>214</b>
Editor Amy Caddick provides an overview of European Commissioner for Mobility and Transport Siim Kallas's Roadmap 2050 for environmentally friendly transport	
<b>A sustainable Sweden</b> . . . . .	<b>219</b>
<i>Public Service Review</i> explores Swedish efforts to tackle energy and transport problems under the guidance of Maud Olofsson	
<b>Pillars for the Earth</b> . . . . .	<b>222</b>
European Commissioner for Energy Günther H Oettinger details a five-pillar plan for securing a European energy strategy	
<b>All at sea?</b> . . . . .	<b>226</b>
Tim Hurst, Thematic Manager of Marine Renewables at SEGEC, considers what is needed to counter the current dearth in funding for marine energy technologies	

SPECIAL FEATURE:  
THE ARCTIC 166

EARTH SCIENCES 171

ENVIRONMENT 176

AGRICULTURE  
AND FOOD 196THE BUILT  
ENVIRONMENT 206

TRANSPORT 212

ENERGY 222

<b>Getting personal</b> . . . . .	<b>230</b>
Personalised medicine has the capacity to change the way in which healthcare is delivered in the future. Tailoring medication according to the individual could, in the long term, save healthcare services millions as well as saving lives. Here, experts highlight why personalised medicine is good for the health sector	
<b>A motion to maximise</b> . . . . .	<b>234</b>
European Commissioner for Health and Consumer Policy John Dalli heralds the importance of technology and innovation in advancing the cause of health	
<b>Of primary concern</b> . . . . .	<b>242</b>
Professor Dr Eva Hummers-Pradier, Director of Hannover Medical School's Institute of General Practice, calls for further research into GP/FM and primary care	
<b>Evolution by revolution</b> . . . . .	<b>244</b>
Editor Amy Caddick turns the spotlight onto Irish Minister for Health James Reilly's ambitious reform plans for the country's healthcare system	
<b>Looking after the children</b> . . . . .	<b>248</b>
Dr Martin J White, Dean of the Faculty of Paediatrics at the Royal College of Physicians of Ireland, reflects on the country's need for a national model of care for children's health	

SPECIAL FEATURE:  
PERSONALISED  
MEDICINE 230

OVERVIEW 234

**Effectiveness before efficacy . . . . . 249**

Dr Roberto Frontini, President of the European Association of Hospital Pharmacists, calls for greater transparency in pharmaceutical research

**Sweden's search for quality . . . . . 251**

Nina Rehnqvist, Chair of the Swedish Council on Technology Assessment in Health Care, asks whether research generates value and if there is a place for commissioning

**The heart of the matter . . . . . 252**

*Public Service Review* catches up with Dr Alain Tedgui, of Paris-Cardiovascular Research Center, to discuss challenges and advances in the field

**Closer to the bone . . . . . 254**

Professor Alan Breen, Director of the IMRCI, explains the need for improved objective assessment of functional musculoskeletal disorders

**The nutrition mission . . . . . 256**

Dr Frank de Man, of the European Nutrition for Health Alliance, speaks to *Public Service Review's* James Morgan about the lack of focus on malnutrition

**A world of difference . . . . . 258**

Dr Roger I Glass, of the US National Institutes of Health, highlights the critical need to build sustainable research capacity in order to improve global health

**Boosting the jobs . . . . . 260**

When it comes to harnessing the power of immunisation in developing countries, GAVI Alliance Policy Director Aurélia Nguyen describes how shaping markets are saving lives

**The AIDS crusade . . . . . 265**

The National Institute of Allergy and Infectious Diseases is one of many organisations contributing to the lengthy battle against HIV and AIDS, *Public Service Review* reports

**Seeing is believing. . . . . 266**

Ophthalmologic research into visual impairment disorders is vital to ensure the number of people suffering from these preventable conditions decreases. Here, experts look at the strides made already with programmes like VISION 2020, and discuss what more needs to be done in the future

**High times . . . . . 271**

January's FISU Winter Universiade in Erzurum, Turkey, showcased the regional value of sport, writes Professor Carmen de Jong, Research Director at The Mountain Institute

**GETTING TO KNOW**

**Getting to know...Tim Smit . . . . . 273**

The world-renowned Eden Project changed the face of the Cornish landscape. Co-founder Tim Smit was instrumental in designing and bringing to life the horticultural attraction that proved that sustainability can be achieved anywhere, even on a mass scale. Here, Editor Amy Caddick asks Smit what drew him to this ambitious but daunting venture

**Index . . . . . 278**

Articles marked \* are Crown Copyright and are reproduced with the permission of the Controller of HMSO and the Queen's Printer for Scotland. Articles marked \*\* are Parliamentary Copyright. Their inclusion does not, however, indicate that this journal is published by or on behalf of any government department.

<b>Managing Editor</b> Lisa Carnwell	<b>Head of Production</b> Melissa Lewis	<b>Head of Studio</b> Emma Kelsall-Tabbenor	<b>General Sales Manager</b> Zarine Bedford	<b>Operations Manager</b> Norman Davies
<b>Editor</b> Amy Caddick acaddick@publicservice.co.uk	<b>Production Manager</b> Chloe Collins	<b>Senior Design Coordinator</b> Andrew Bosworth	<b>Sales Manager</b> Sukhi S. Shetra	<b>Distribution and Circulation</b> Adam Eardley Samantha Kensett
<b>Commissioning Editor</b> James Morgan Michael Brennan	<b>Production Coordinators</b> Stephanie Cowie Robert Egan Nick Wilde Nicola Harvey	<b>Senior Designers</b> Phil Kelsall Kelly Burgess	<b>Sales</b> Razwan Ahmad Tanya Franco Michael Lysenko Esuan Steenkamp	<b>Chief Operating Officer</b> Wendy Wood
<b>Senior Subeditor</b> Emily Hawkes		<b>Designer</b> Denise Johnson	<b>Research Manager</b> Tanja Price	<b>Chief Executive Officer</b> Gordon Warrender
<b>Subeditors</b> Robert Doolan Rebecca Bailey		<b>Mac Operator</b> Ben Green	<b>Research Assistant</b> Hayley Underwood	
<b>Editorial Assistant</b> Katy Edgington				
<b>Proofreaders</b> Jane Oliver Jean Bell Charisse Sayers				

The editor does not necessarily agree with or endorse any of the views or contents of the articles and features within this document. All articles and editorials remain the copyright of the authors, organisations and other relevant authorities by whose kind permission they are reproduced. All information has been checked and is correct at the time of going to press. The publisher will not be liable for any loss suffered directly or indirectly as a result of the use of or reliance on the information contained herein.  
Printed in the UK by Pelican Press  
© publicservice.co.uk Ltd 2011  
Front cover designed by publicservice.co.uk Ltd  
ISSN 2045-3876 (Print), 2046-5688 (Online)  
Printed on Totally Chlorine Free (TCF) paper which is accredited with the Nordic Swan Environmental Label. The fibre is produced from sustainable forests in Scandinavia.



publicservice.co.uk Ltd and its suppliers collect and process personal information for the purposes of customer analysis and market research. Our group/affiliate companies may also wish to contact you about our products or services, or the products of carefully selected third parties that we think you may be interested in.  
I do not wish to receive communication from:  
 publicservice.co.uk Ltd  
 Other publicservice.co.uk Ltd companies  
 External companies



Total average net circulation 3511  
Audit period 01-Jul-2010 to 30-Jun-2011



publicservice.co.uk Ltd  
Ebenezer House, Ryecroft,  
Newcastle-under-Lyme  
Staffordshire ST5 2UB  
United Kingdom  
tel: +44 (0)1782 630200



www.publicservice.co.uk

# A valuable lesson

Leif Moos et al, of EERA, underline the importance of education research in addressing the challenges facing Europe...

**T**he European Educational Research Association (EERA) consists of 27 national and regional organisations from all over Europe. It is committed to the construction of a European Research Area within the field of educational enquiry and research and so naturally looks for what it can contribute to the EU common strategic framework for research. EERA also wants to contribute to the implementation of that framework in partnership with public and private sector institutions, as indeed it did under the 7th Framework Programme. Sustainable economic and social development on a European level cannot happen without close attention to what happens in education at all levels within the different nation states in Europe. Education research is fundamental to this.

**‘To respond successfully to the challenges of climate change, depleting natural resources, population growth, globalisation and multiculturalism, our lives and lifestyles must change and this necessitates an educated understanding of these issues and their consequences.’**

However, while in the Commission’s official strategies we can see descriptions of the grand challenges of the global economy, transnational financial governance and the competitiveness of the nation states – and how research, innovation, technology and hard science can give answers to these challenges – there is a silence about the role of social science, humanities and educational research.

The picture of research and in particular social and behavioural science research created by the Commission in ‘Innovation Union’ (2010), ‘Europe 2020’ (2010) and the EU green paper ‘From challenges to opportunities: Towards a common strategic framework for EU research and innovation funding’ is based on an economic and technological worldview. The preoccupation with science and technology distorts the vision of research and innovation in many ways, for example in considering research on social innovation. The green paper seems to

suppose an outdated linear relationship between research and practice. It follows the research development and diffusion paradigm in which once research has been conducted, a separate task of ‘knowledge transfer’ has to be carried out. Change and development is then merely seen as something that could happen through transformation of information from one entity to another.

The failure of this approach to innovation has been documented for a long time. The linear research agenda laid out: research – innovation – products/services (technologies) ignores the knowledge of both social and behavioural science and humanities research. It makes no reference to the role that social scientific, and even more broadly, arts and humanities research can play in informing dimensions of innovation, creativity, social innovation and changes in practices.

European societal development, economic growth, balance of trade and competitiveness do not rest simply on the products of science and technology. Within a production paradigm some of the more ‘soft’ areas of



*The European Commission’s research strategy is, at present, too reliant on an economic and technological worldview, EERA believes*

human cooperation and development are often overlooked. EERA's argument is that if the European Commission wants to support research in order to stimulate sustainable growth and development, this cannot be done solely through an emphasis on one kind of research. We are of course not taking a stance opposed to science and technology. This would be absurd. We want, however, to emphasise the insufficiency of these disciplines alone in tackling the sort of issues and in serving the priorities that are indicated in the green paper and elsewhere – and hence the need for the sort of research provided by the social sciences and humanities to be part of the EU's vision.

Today and in the near future we will need to tackle, for example, the problems of climate change and environmental sustainability; this will require responses rooted in science and technology, but also an understanding of human behaviour, sensibility and responsibility. This entails having an awareness of being a global citizen and being open to thinking creatively about finding solutions for all citizens. None of this can happen without education. Hence the need for research in order to expand our knowledge of these huge challenges and shape how we can educate and change our perspectives and behaviour.

**‘...if the European Commission wants to support research in order to stimulate sustainable growth and development, this cannot be done solely through an emphasis on one kind of research.’**

There are several grand challenges that are not mentioned in the EU papers, including health (other than in terms of medical science), cultural learning and the creative economies, social inclusion and social justice, democracy, multiculturalism and immigration, the mobility of the EU population, identity and citizenship, and arts and culture. These are all areas that require sophisticated knowledge if we are going to be able to handle or possibly solve some of the issues involved. As part of this process education cannot be overlooked, and in order for education to function properly educational research is needed.

Educational research draws on multiple scientific disciplines. Social and behavioural science and humanities are occupied with the very foundations of education: the search for explanation and understanding of human thinking, creativity, action and behaviour, and of social interactions, structures, change and communication. All disciplines can make a claim to relevance, but the following three examples are illustrative of the important contribution that educational research can make to society:

- Societies, economies and technologies change rapidly and this requires continuous professional development of the workforce, opportunities for re-skilling and thus for lifelong learning. This in itself is an area requiring research, but as change brings about the need for new knowledge this has to be connected with developing new teaching approaches, methods, situations and material;
- The appreciation of what innovations in science and technology might offer in terms of wealth creation and the solution of social and environmental problems requires an educated understanding, an educated creativity, and an educated framework of individual moral and social responsibility;
- To respond successfully to the challenges of climate change, depleting natural resources, population growth, globalisation and multiculturalism, our lives and lifestyles must change and this necessitates an educated understanding of these issues and their consequences.

There is a danger that the current EU Commission strategic policy preferences will push the social and behavioural sciences and humanities, including educational research, to the margins of the research arena and thereby ignore the insights into the human condition that these provide. Any sustainable future cannot be based on science and technology alone, but requires a continued engagement with the human factor, an engagement central to educational research.

Leif Moos  
President

Ian Grosvenor  
Executive Board Member

Marit Honerod Hoveid  
Executive Board Member

Theo Wubbels  
Executive Board Member

Maria Pacheco Figueiredo  
Executive Board Member  
European Educational Research  
Association (EERA)  
[www.eera-ecer.eu](http://www.eera-ecer.eu)