



The Role and Relevance of Science Education for Modern Societies

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Dear Reader,

When we speak about building a European Research Area, how often do we consider its logical prerequisite: a European Education Area? Without effective science education, the number of future researchers and scientists will dwindle in respect to the high demand, which threatens innovation power and economic growth. When policymakers at the European Commission announce the goal of creating an Innovation Union, then surely the innovators – and perhaps more importantly, future innovators – must somehow be included in the long-term strategy.

But the truth is that science education is about more than simply raising the new generation of scientists. It's about teaching scientific literacy to all citizens so that societies can function at an advanced level. It's also about teaching science pragmatically. Children are naturally curious about the world around them, which is why pedagogic methods like inquiry-based science education (IBSE) are so effective. In our [feature article](#), we discuss what science education can bring to modern societies and how IBSE in particular can help improve science education for both the pupil and the teacher. We also feature the ALLEA Working Group on Science Education's recent efforts towards promoting IBSE as well as an [interview](#) with Silvia Costa, Chair of the Committee on Culture and Education at the European Parliament.

In European Commission news, the entire scientific community has rallied to stop President Juncker from raiding the Horizon 2020 budget in order to support the European Fund for Strategic Investment's (EFSI). With the proposed cuts totalling 2.7 billion euros, science and research in Europe face significant setbacks. In this issue, we report on the current situation and recap ALLEA's efforts on behalf of the budget for science and research.

Lastly, I am very pleased to announce that the 2015 All European Academies Madame de Staël Prize for Cultural Values will be awarded to Dame Professor Helen Wallace, current Foreign Secretary of the British Academy. I am thankful that ALLEA is able to honour Dame Helen's extensive and highly valuable work in the field of European policy and her steadfast commitment to European integration in the context of this year's General Assembly. Moreover, I am especially delighted and honoured that the Commissioner for Science, Research and Innovation, Carlos Moedas, will be delivering a speech at the award ceremony. I look forward to seeing you in Lisbon!

Kindly yours,

Günter Stock

ALLEA Board Meeting in Jerusalem

For its last meeting of 2014, the Board convened at the Israel Academy of Sciences and Humanities in December

האקדמיה הלאומית הישראלית למדעים
THE ISRAEL ACADEMY OF SCIENCES AND HUMANITIES



The ALLEA Board met in Jerusalem on the premises of the Israel Academy of Sciences and Humanities from 3 – 4 December 2014. Further to the reporting session on recent, current, and future ALLEA activities as well as on-going and planned future initiatives and projects by ALLEA's five working groups, the meeting focused on ALLEA's collaboration with other European academy organisations, including EASAC, Euro-CASE, Academia Europaea and FEAM, in contributing to the evidence-based policy advice system in the European Union.

With the new Commission in office since November 2014, a number of far-reaching decisions have been taken regarding the future role and structure of implementing scientific evidence in the policy-making process. Concretely, the position of the Chief Scientific Adviser (CSA) was discontinued and the Bureau of Europe-

an Policy Advisers (BEPA) was dissolved. The Board underlined the crucial role of scientific

advice and called upon the President of the European Commission to elaborate a sound system that allow evidence-based positions to enter into the policy-making process.

The programme furthermore included a tribute from the ALLEA President to outgoing Board members Menahem Yaari and Peter Kennedy, delegates of the Israel Academy of Sciences and Humanities and the Royal Irish Academy respectively, highlighting their invaluable contributions and great efforts for ALLEA. The Board members joined the President in thanking both for the work and friendship over the last three years.

The [Israel Academy of Sciences and Humanities](#), established by the Knesset in 1961, is an all-embracing body with 112 members in two sections. It is administered by a six-member Council headed by President.

It has spearheaded major initiatives like the Israel Science Foundation, the National Council for Research and Development and membership in CERN, ESRF, etc. Through 32 bi-national agreements the Academy promotes reciprocal

New Board Member Professor Ruth Arnon



From January 2015 onwards, the Israel Academy of Sciences and Humanities will be represented in the ALLEA Board by its President, Professor Ruth Arnon, who was warmly welcomed on the occasion of a dinner on the evening prior to the meeting on the invitation of the host academy. Ruth Arnon is an immunologist with a worldwide reputation. She is the Paul Ehrlich Professor of Immunology at the department of immunology at the Weizmann Institute of Science, which she formerly headed. Her scientific research has focused on the development of advanced vaccines, cancer research and parasitic diseases. She served as an adviser to Israel's President Shimon Peres on scientific matters, is a recipient of the Israel Prize and a member of the French Legion of Honor.

scientific visits and coordinates international scientific workshops. It is Israel's adhering member in major international scientific unions and organisations.



The ALLEA Board in Jerusalem

Madame de Staël Prize for Cultural Values to be awarded to Dame Helen Wallace



In honour of her highly respected and extensive scholarly work on political studies and policy in Europe, Dame Helen Wallace will be the second scholar to be awarded the All European Academies Madame de Staël Prize for Cultural Values.

Professor Wallace's research not only offers comprehensive and incisive insights into the political systems of Europe, but is also a powerful

contribution towards analysing the complexity of European integration. "Especially in view of the growing scepticism towards European cooperation, it is even more imperative that we honour research such as Dame Helen's which helps us better understand how European integration can be achieved", says Professor Günter Stock, ALLEA President and chairman of the prize jury. "Dame Helen has provided us with an invaluable resource in her work. Her personal as well as her scholarly integrity is unwavering and her commitment to European cooperation is undisputed".

The laureate has served as Foreign Secretary of the British Academy since 2011 and was previously Professor at the European Institute of the London School of Economics and Political Science. Professor Wallace's research has focused on European politics in nearly every context and region, establishing her reputation as an authority in the field. Her seminal work *Policy-Making in the European*

Union is currently entering its seventh printing. Her advice and consultation is sought after at the highest levels of European policy making.

The prize ceremony will take place on the evening of 23 April at the 16th ALLEA General Assembly.

The [All European Academies Madame de Staël Prize for Cultural Values](#) is co-sponsored by Stiftung Mercator and endowed with 25,000 EUR. ALLEA established the prize to pay tribute to the boundless intellectual and cultural diversity and richness of Europe, and to highlight how outstanding scholarly work, particularly in the fields of the humanities and social sciences, contributes to the understanding of Europe as a cultural and intellectual entity. The first laureate, Professor Luisa Passerini, received the prize from former European Commission President José Manuel Barroso in 2014 to honour her work on European cultural identity.

ALLEA President delivers Keynote Lecture at Balzan Prizewinners' Forum

In his speech, Professor Günter Stock underlined the advantages prestigious awards such as the Balzan Prize offer the science and research system.

By forming a list of desiderata that include such needs as true interdisciplinarity, the preservation of the roots of innovation – namely, curiosity-driven research including that in the social sciences and humanities – and effective science education for the younger generation, Professor Stock laid the groundwork for discussing the role of academies and foundations in achieving these goals. He placed particular emphasis on the historic ability of academies and foundations to provide a safe environment for new ideas and research pro-

jects away from the mainstream and identify new challenges and needs at their earliest stages. Furthermore, he highlighted the unique position of these institutions in bringing science and the public closer together in order to promote a productive space for public deliberation. Lastly, he lauded the cooperation between the Balzan Foundation and the Accademia dei Lincei as a glowing example of academies and foundations joining forces and emphasised the benefits of more institutions engaging in cooperative activities on behalf of the scientific community.

Opening remarks were provided by Alberto Quadrio Curzio, Vice-President of the Accademia dei Lincei, who

noted ALLEA's "fundamental role" in addressing science policy issues, and Salvatore Veca, Chairman of the Balzan General Prize Committee. The 2014 Prize recipients, introduced by members of the General Prize Committee, then spoke about their careers while emphasising the achievements that earned them the Prize. The talks were followed by comments by panelists and questions from the audience, with Enrico Decleva, the President of the International Balzan Prize Foundation, acting as moderator.

To read Professor Stock's keynote lecture, please click [here](#). To view a video of the forum, please click [here](#).

ALLEA and partner organisations rally against Horizon 2020 cuts

In a [letter](#) sent to Jean-Claude Juncker on 9 December 2014, the ALLEA President responded to the proposal for a European Fund for Strategic Investments (EFSI) which aims to boost job creation and economic recovery in Europe.

While expressing ALLEA's support for the Commission's efforts to fuel sustainable growth and prosperity in the European Union, as well as tackling major concerns facing Europe such as unemployment amongst young people, the letter argued that it would be counterproductive to remove funds from Horizon 2020's agreed budget and therewith impair the immense potential impact of high-quality research for growth and prosperity in Europe.

Considering that a total of €2.7 billion was planned to be reallocated from the Horizon 2020 budget to the European Fund for Strategic Investment, the ALLEA President states: "The Horizon 2020 budget is already under pressure, with vastly increased demand and lower budget available in 2014 for key areas than the preceding year. In our view, decreasing this budget further in an area already agreed as a priority is not the way to proceed in order to achieve sustainable growth and prosperity."

Despite concerns from the scientific community, in January the Commission released the proposal for the EFSI regulation which contains the full €2.7 billion funding cuts. This reallocation translates into an 8.4% budget cut for Horizon 2020 in 2016 and an 8% cut in 2017. All areas of Horizon 2020 will be affected as well as the European Research Council (ERC), with a total reduction of Horizon 2020's budget by 3.5%. Research Professional reports that if EFSI is successful, Juncker may take even more money from research funds during the second half of Horizon 2020.

Members of the Industry, Research and Energy Committee (ITRE) at the European Parliament have supported Horizon 2020 by proposing amendments that would remove the cuts from the regulation and instead support a more gradual annual budgetary procedure. With discussions in the Council of the European Union and the European Parliament underway, ALLEA has continued its efforts to protect funding for research by endorsing a [statement](#) originally published by the British Academy. The statement urges those in the European institutions to work towards amending the EFSI regulation during the deliberations so as to avoid decimating the Horizon 2020 budget and issues recommendations on how to achieve these amendments.

In order to truly benefit research and innovation as well as the planned investment fund, the statement argues that EFSI should be constructed with the involvement of independent expert researchers as well as the European Research Council, which is also in danger of significant budget cuts. It also addresses the issue of accountability and presents a set of priorities that are aligned with the Europe 2020 strategy and should be used to guide EFSI's activities. Additionally, the statement recommends that "existing and demonstrably effective delivery mechanisms for funding, such as the European Research Council and Horizon 2020, be used to deliver as much EFSI funding as possible".

Alongside ALLEA, other academy and scientific organisations in Europe have issued statements in an effort to safeguard Horizon 2020's budget, including a group of Young Academies; the League of European Research Universities (LERU), Science Europe; Academia Europaea; and a group of national university organisations, among others.

Update: Chief Scientific Adviser

Since our last issue of December 2014, rumours regarding the European Commission's plans for the defunct CSA position have been reported by diverse media. According to Research Professional, the current status is that the new Commissioner for Research and Innovation, Carlos Moedas, is in the process of reviewing options for providing independent scientific advice to President Juncker. It appears that the review will focus on finding options that acknowledge both the well-established role of the CSA in the UK and the USA as well as alternative models such as those in France and Germany which rely on consortia of scientific institutions, including Academies, to collectively offer scientific advice.

Meanwhile, the European Parliament is reportedly overhauling the Science and Technology Options Assessment unit (STOA) in order to increase its visibility. STOA will allegedly focus more on foresight and trend prediction in an effort to revitalise its current tendency of issuing neutral reports that avoid creating conflicts with MEPS (and render STOA in its present state unable to issue a clear recommendation one way or another). This focus would allow STOA to be involved earlier in the advisory process, which is a clear advantage considering that the politicians tend to make up their minds before the scientific advice is even available.

It is a positive sign that Juncker has charged Moedas with investigating new models of providing evidence-based, independent scientific advice as opposed to neglecting the matter of replacing the CSA completely. The Parliament's efforts to increase STOA's visibility can likewise be received as a welcome development. However, it remains to be seen whether these efforts will truly bring lasting and positive effects for evidence-based policy advice.

ALLEA President participates in Euro-CASE Annual Conference

The Annual Conference on “Evidence-based Policy Advice and Innovation Policy beyond Horizon 2020” of the [European Council of Academies of Applied Sciences, Technologies and Engineering](#) (Euro-CASE) took place on 3 December 2014 in Brussels and was attended by over 200 invited guests.

At the conference, the Presidents of ALLEA, EASAC and Euro-CASE, declared their commitment to a stronger partnership at the European level while noting the importance of an interdisciplinary approach towards offering science policy advice. ALLEA President Professor Günter Stock took part in a panel discussion on the subject “Evidence-based policy advice to the EU – novel approaches of dialogue formats”. Further panelists included, among others, former Chief Scientific Adviser to the President of the European Commission Anne Glover, Deputy Director General Wolfgang Burtscher of the Directorate-General for Research and Innovation, and Joint Research Centre Director-General Vladimír Šucha.

Innovation policy after Horizon 2020 and future challenges for Europe were also central to this year’s conference. High-ranking international guest speakers presented European and international perspectives on innovation policy and Euro-CASE revealed a new policy paper on this topic. Concrete questions about the role of industry, internationalisation, simplifying the application process and the systematic implementation of the whole innovation chain in future EU framework programmes were central to these discussions.



*From left: Günter Stock, Anne Glover, Reinhard F. Hüttel, Jos van der Meer (EASAC)
photo ©FKPH*

Throughout the presentations, it became clear that for Europe to be a successful innovation centre, it needs innovation that takes more risks and embraces an “entrepreneurial spirit”. Successfully bringing research results to the market was also deemed a major factor for Europe’s economic growth. It was emphasised that Academies are in the position to promote independent and transdisciplinary sci-

ence-based policy advice and thereby significantly contribute to strengthening the evidence-based nature of political decisions at the European level. ASE, concluded: “We can only meet today’s global challenges together with an interdisciplinary approach. Together we can offer a comprehensive and holistic science-based policy advice at the European level”.



Günter Stock at the panel discussion, photo ©FKPH

The Role and Relevance of Science Education for Modern Societies

The days of memorising facts and figures are becoming a thing of the past. Outdated methods of science education need to be replaced by modern teaching methods that focus on inquiry- or investigation-based education in order to prepare young people for future societal challenges and improve scientific literacy for the larger population. To achieve this, all relevant sectors of society need to work together: governments, industry, and the scientific community. In view of rapidly advancing science and technology, an increasingly globalised economy, and innovation and growth sectors that depend on a robust skilled workforce, effective science education brings advantages that benefit all sectors of society in any given nation.

With the ultimate goal being a fully scientifically literate and knowledge-based society, scientific literacy is defined by the Organisation for Economic Co-operation and Development (OECD) PISA Framework (2015) as “the ability to engage with science-related issues, and with the ideas of science, as a reflective citizen”. A scientifically literate person

therefore asks questions based on curiosity about every day experiences and is able to use scientific reasoning in seeking the answers to those questions. Scientific literacy demands that one is able to evaluate and address questions scientifically as well as critically interpret data and evidence that may lead to a conclusion.

Unsurprisingly, the advantages of scientific literacy and, more concretely, scientific skills acquired through education are most often associated with economic growth and higher employment levels. The increasing complexity of technology requires higher levels of scientific understanding throughout the workforce than ever before. However, it is important not to limit the focus to only producing more scientists, engineers and researchers. Effective science education also provides societies with needed mechanics, electricians, and other technicians. It supports not only high-tech innovation, but also inventors and entrepreneurs who contribute to building a dynamic economy. Furthermore, it helps teach versatile transferable skills such as communication and management skills that are necessary accompaniments to specialised knowledge. In this way, science education and the resulting scientific literacy and increased employability bring growth to nearly all sectors in society while improving the overall standard of living.

Increasing a population's collective scientific literacy also yields

benefits that help the society to function at an advanced level. Scientific literacy helps citizens approach controversial public issues logically and critically, such as corruption, extremism, or religious debates, especially issues that are emotionally laden. For example, teaching creationism in school or the introduction of new stem cell research legislation are topics that tend to incite strong reactions among the public. More constituents applying scientific reasoning to issues like these can result in more productive and constructive discourse as opposed to an oversimplified and ideological debate that often results in a standstill. When democracy requires citizens to play an active part in making legislative decisions, scientific literacy plays an indispensable role in helping citizens to make informed decisions and also leads citizens to engage more in scientific and social issues.

Another area in which scientific literacy plays an important role is public health. Scientific literacy plays a vital role when combating infectious and highly contagious diseases. The recent Ebola outbreak, for example, has been extremely difficult to contain partly due to the conflict between cultural and scientific aspects such as customs that require handling or traveling with an infected corpse. In another example, understanding the makeup of food, how the body processes it and how proper nutrition improves health as well as how exercise benefits the body can help slow obesity and disease rates. Increased scientific literacy levels anchored by a strong science education system can thus help societies to tackle not only unexpected health challenges but also day-to-day health topics that affect all citizens.



Photo © Ohio Sea Grant and Stone Laboratory

Achieving a knowledge-based society depends on a joint effort from the scientific community, industry and policymakers to foster not only higher education, but primary and secondary education as well. By investing in the science education of young pupils, the numbers of students who go on to study science at a higher level can substantially increase. When these students study abroad, and perhaps ultimately emigrate in order to further their careers, the host countries benefit from adding in-demand engineers, scientists, and others to their skilled workforces. However, high numbers of emigration can result in a “brain drain” in many less developed countries.



Photo © Paul Weaver

The resulting imbalance is why all governments, especially those in developing countries, also need to invest in an attractive higher education system. Apart from funding science education initiatives, governments can work on developing education policies that better link curricula and infrastructures from primary through tertiary education in order to ensure a smooth pathway to a career in science. Industry, for its part, needs to engage with tomorrow's skilled workers in order to offer a desirable working environment and to retain and build the skilled workforce needed to achieve a knowledge-based economy. Innovation and growth can only be sustained and improved in the long-term through a coordination of efforts that address all the elements in the chain: effective primary and secondary science education, quality higher education institutions, and a competitive science and technology sector ready to absorb new skilled workers.

Inquiry-Based Science Education (IBSE)

Science education is a logical prerequisite to achieving scientific literacy. However, surveys and studies

such as the [ROSE](#) study show that science, technology, engineering, and mathematics (STEM) education suffer from factors such as a lack of student interest and even scepticism or avoidance of those subjects. This is a problem that can damage or slow down a country's rate of growth. An inquiry- or investigation-based approach can help combat these challenges by providing pupils with hands-on learning experiences. Instead of giving facts and figures to children to memorise, IBSE seeks to tap into the innate curiosity of children about the world around them. Therefore, IBSE is especially important during the primary school years, but it also benefits secondary school students who struggle with or dislike STEM subjects.

In IBSE, the teacher functions as a guide while the students are the main actors. They are encouraged to ask questions, formulate hypotheses, perform experiments and critically interpret results. IBSE is thus grounded in “learning by doing”, which promotes active participation of students and helps pupils better understand processes or phenomena that on paper are very abstract. However, even though this ap-

proach to science education is very student-centred, teachers must still be properly trained in order to successfully implement IBSE in the classroom. For example, they need to be able to help pupils develop the confidence required to ask questions and try out ideas without knowing what the results will be. Continued Professional Development (CPD) is therefore a major aspect of an effective science education system, not only so that teachers are informed about developments in their subject areas, but also to ensure that teachers can continually optimise their pedagogic knowledge for the benefit of young pupils.

Like science education in general, governments, industry and the scientific community all play special roles in fostering IBSE in particular. Governments need to provide necessary funding for CPD programmes and interact with fora and committees dedicated to fostering CPD and IBSE. Industry can work together with academia ([link to report](#)) in order to develop more strategies towards reaching out to young people studying STEM subjects as well as sponsor programmes that promote IBSE and CPD. Representatives from the indus-

try sector who depend on the availability of skilled workers can also help convince governments to pay more attention to science education starting at the primary school level.

There are many organisations like *La main à la pâte* and *Scientix* as well as projects like *SAILS* and ALLEA's very own *AEMASE* which actively promote IBSE and emphasise the importance of providing CPD for science teachers. In many countries, funding for teacher training and other aspects of education is low. Projects like these thus play a major part in promoting IBSE and bringing the IBSE approach to more schools, especially in countries whose science and technology sectors are budding or still developing. Advocates of IBSE hope that by doing so, they can not only prepare young people for careers in the science and technology sector, but also improve the overall scientific literacy of societies, which benefits all citizens regardless of their profession.



Photo © Desiree

ALLEA Initiatives in Science Education

ALLEA's Working Group on Science Education, which also serves as the regional council of the science education programme of IAP, the global network of science academies, has been active in fostering quality science education for young people in and outside of Europe for many years. The 2012 report "[A renewal of science education in Europe](#)" was written in response to a request from the European Commission seeking to assess the national impacts of the Framework Programme pilot projects on behalf of better science education. With detailed contributions from 25 European countries, the report addresses a spectrum of issues faced by science education and promotes a strong effort in the sphere of science teacher training (pre- and in-service) through better interaction at the level of the national education systems and between the scientific community and stakeholders in politics, society and the corporate sector.

More recently, the WG organised a forum in November 2013 with the Royal Irish Academy which brought together industry and education partners to discuss existing and identify future potential collaborative efforts to enhance science, technology, engineering and mathematics (STEM) education with reference to existing and emerging European initiatives in this space. A [report](#) released in mid-2014 provides a comprehensive look at the current challenges of adapting European school curricula to IBSE teaching methods and the need to simultaneously build an academia-industry alliance to further the progress of science education in Europe.

In 2014, the WG organised a conference, which took place in May at the Accademia Nazionale dei Lincei and brought together academies and organisations from Europe, Africa and the Mediterranean region in order to promote a North-South alliance for fostering IBSE and science outreach to society. At the African European Mediterranean Academies for Science Education (AEMASE) conference, participants from six continents shared their professional experiences with IBSE and discussed best practices, challenges and future collaboration opportunities. The conference furthermore brought together representatives from three crucial areas of expertise: science, education, and policy. Its outcomes are collected in a comprehensive [report](#) and an accompanying [primer](#) which were extensively disseminated and can be ordered from the ALLEA secretariat at no cost. Currently, the AEMASE project is [being further developed as a network](#) with applications for additional funding and planning of future activities underway.

Interview: MEP and CULT Chair Silvia Costa

“We have to foster a permanent relationship between science, education, culture, university and entrepreneurship”

Since last summer MEP Silvia Costa has chaired the Committee on Culture and Education at the European Parliament. For this newsletter issue focusing on science education, Ms. Costa generously agreed to answer a few questions about science education in the European Union and the Committee's role in its development.

ALLEA: *Where do you see opportunities for fostering science education in Europe, and what are in your opinion the biggest challenges, especially in view of building a future skilled workforce in science and innovation?*

Ms. Costa: The EU has finally realised that innovation is not just about technology, and that the latter is fully cross-sectorial in society and in the lives of citizens. Here, more than in a “separating” vision of information and communications technology (ICT) and science, I see the greatest potential for development and more opportunities for dialogue between scientific education and culture and other disciplines.

That's what we want to strongly support by looking for a new and stronger relationship between research, technology and culture in the EU programmes for 2014-2020. In times of crisis, the Europe 2020 strategy is leading us to a consistent increase in attention to culture, research and education. The European Parliament has worked hard to bring this turnaround: culture is finally starting to be a sector and a horizontal dimension of a new kind of sustainable development. It means that we've realised that all of these areas can be a real and robust axis for new development.

We'll work to follow this approach and to continue all of the current efforts. Horizon 2020 will allocate over 70 billion euros for research over the next seven years and, through an initiative of the Parliament, we have integrated culture and humanities as well as the digitisation of cultural heritage as activities which may be supported by research and science.

ALLEA: *As Chair of the Committee in charge of education and culture: What role does the European Union - and specifically the European Parliament - play in the development of science education in Europe? Could you give some examples of CULT's strategic proposals to the Parliament in this area?*

Ms. Costa: A basic understanding of science is considered a necessary skill for every European citizen. Concerns about low student performance in basic skills, as revealed by international surveys, led to the adoption in 2009 of an EU-wide benchmark which states that “by 2020 the share of 15-year-olds with insufficient abilities in reading, mathematics and science should be less than 15%”.

In order to achieve the benchmark target by 2020, we must jointly identify obstacles and problem areas on the one hand and effective approaches on the other. Many international reports identify the potential shortage of human resources in key scientific professions and call for modernising the teaching of science in school. How is it possible to raise the motivation of pupils, increase their interest in science, and at the same time, increase achievement levels? Can science education in schools be successful in reaching all pupils as well as educating future scientists?

Silvia Costa



Professional journalist, in her mandate 2009-2014 as MEP she has been Member of Committees Culture and Education, Women's Rights and Gender Equality and Civil Liberties. She has been rapporteur for the European Parliament of the Creative Europe Programme 2014-2020.

She has previously been Lazio regional councillor responsible for education, educational rights and training; president of the National Commission on Gender Equality, counselor at the National Council for Economy and Jobs (CNEL), deputy-minister for University and Research in the Ciampi government, an MP, Rome city councilor of Rome, president of the Academy of Fine Arts, Rome (1995-2005) and co-founder of the ONG for Children's rights Telefono Azzurro (1987).

Visit her European Parliament website [here](#).

Approximately 60% of higher education graduates in the fields of science, mathematics and computing are men. How can this gender imbalance be improved? These are some of the issues addressed by the CULT committee. These are our immediate challenges to which we have to devote all our commitment.

ALLEA: *In what ways is science education integrated in the Horizon 2020 framework and how can this integration be optimised?*

Ms. Costa: Building capacities and developing innovative ways of connecting science to society is a priority under Horizon 2020. This will help to make science more attractive to young people, increase society's appetite for innovation, and open up further research and innovation opportunities.

Making science education and careers attractive for young people is an ambitious goal, since it aims to drastically improve science and technology literacy in our society. Innovative formal and informal science education, and both their teaching and learning aspects, is important in order to raise young boys' and girls' awareness of the different facets encompassing science and technology in today's society and to address the challenges faced by young people when pursuing careers in Science, Technology, Engineering and Mathematics.

Therefore, a sustainable and cross-cutting interaction between the relevant actors in the field is crucial: different levels of the education system, universities and other higher education establishments, research and innovation funding and performing organisations, civil society organisations and NGOs, industry, policymakers, professors, teachers, students and pupils, science museums and science centres. Within the Horizon 2020 programme, a call



has been launched with the aim of making science education and careers attractive for young people.

ALLEA: *To what extent do the European Institutions consider the concept of building a European education area, similar to the European Research Area?*

Ms. Costa: The European Education Area exists, and it is based on the open method of coordination of educational policies of the Member States. Respecting the principle of subsidiarity, it aims for the mutual recognition of degrees and academic credits for the mobility of European students, teachers and trainers; improved quality of education and vocational training; the creation of a system of equivalent qualifications (EQF); educational exchange and cooperation; and the upgrading of professional skills, also through the European Professional Card (EPC). These aims are on the basis of the Lisbon Strategy which in 2000 launched the goal of making Europe the most important knowledge-based economy in the world.

ALLEA: *In what places do culture and science education intersect in Europe? How can science education and scientific literacy best be combined with, for example, conflicting religious beliefs or cultural traditions?*

Ms. Costa: Science education means the development of ways of looking at reality, and relating oneself to it. That implies ways of thinking, talking, and working, but above all the ability to tie together all of these aspects. This is why we have to foster a permanent relationship between science, education, culture, university and entrepreneurship, taking into account that youth employment can only grow if we create innovative infrastructures and services. In the idea of the culture to which we aspire, science and humanities come together to build what Steve Jobs used to call "New Humanism", which is fundamental for the smart, inclusive and sustainable growth of our societies and of the individuals within them.

Therefore, aside from the challenge of security and development cooperation, the EU should also base new strategies of living together on education and culture.

This written interview was finalised for release on 12 March 2015.

Working Group Science Education

WG Science Education meets in Paris, honours outgoing and incoming Chairs

The ALLEA Working Group on Science Education met on 17 December at the Académie des sciences for its last meeting of 2014. A number of recent and planned future activities on the basis of a written report including an action plan were discussed by the Working Group, which works closely with the IAP, the global network of science academies. The following meeting on 18 December was devoted solely to the AEMASE project which focuses on supporting investigation-based science education in Europe, the Mediterranean states and Africa.

A number of WG members attended the IAP Science Education Programme (SEP) Biennial Conference which took place in Beijing in October. The theme of the conference, "Challenges and Opportunities of Inquiry Based Science Education (IBSE)/Science, Technology, Engineering and Mathematics (STEM) Education", was directly in line with the WG's main areas of concentration. A declaration was also released and later endorsed by the Executive Committee of the IAP, which called for a strengthening of the role of IBSE education worldwide. Academies of sciences were encouraged to translate the declaration and use it to take concrete actions on behalf of science education.

Other topics of discussion included ideas on how to bring more attention to the issue of North-South cooperation in developing science education. Science literacy was a major issue in the conference agenda and was also discussed at the WG meeting. It was agreed that science education is the grassroots of science literacy in society and should not be confused with "science communication". The need to be actively present on the political

level and consider the evolving nature of IBSE in view of the UN's forthcoming Sustainable Development Goals was also emphasised.

The WG's commitment to the crucial necessity of supporting science education was confirmed by the document *Vision*, presented by Sarah Giles of the Royal Society. The Society's report represents a plan for science education for the next 20 years that "should enable people to make informed choices, empower them to shape scientific and technological developments, and equip them to work in an advanced economy".

Lastly, much gratitude is due to Professor Odile Macchi of the Académie des sciences, whose three-year term as Chair of the WG has come to an end. The WG applauded her excellent leadership, many hours of hard work and unwavering commitment to the WG. She will pass the chairmanship on to Professor Giancarlo Vecchio of the Accademia Nazionale dei Lincei. The WG proposed that the Lincei be the Lead Academy for the next three years, which will require confirmation by the IAP Co-Chairs.



After her three-year term, Professor Odile Macchi has passed the WG Chairmanship on to Professor Giancarlo Vecchio.

AEMASE Committee convenes in Paris



As a further follow-up to the very successful conference that took place in May 2014 in Rome, the organisers of the AEMASE (African European Mediterranean Academies for Science Education) conference, which include numerous Working Group Science Education members, met in Paris on 18 December to plan next steps and analyse future possibilities.

Most significantly, plans for the next AEMASE Conference have materialised with the aim of holding a second conference in autumn 2015. Following positive funding approval, the location of the conference will be formalised and an organising committee established. Possible focus topics for the conference were also discussed which included an EU-Africa collaboration, the political arena for science education and twinning projects. The conference would seek to continue the momentum gained by the first conference and explore more ways of fostering investigation-based science education.

A more general discussion also took place regarding how to best organise the relations between European and African academies and pursue further actors who could become involved, whether via a network or an official collaborative action between ALLEA and the Network of African Science Academies (NASAC). Possible ways of formalising such a structure were discussed with the view to opening a more detailed discussion at the second AEMASE conference.

ALLEA represented by WG SSH at European Commission Stakeholders' Workshop

On 27 November 2014, ALLEA participated in the stakeholder workshop "Embedding Social Sciences and Humanities (SSH) in Horizon 2020" in Brussels. The invitation-only workshop was attended by a limited number of eminent experts from international scientific organisations and representatives from the European Commission, particularly from its Directorate-General for Research and Innovation. ALLEA was represented by Professor John Bell, Chair of the ALLEA Working Group on Social Sciences and Humanities (SSH) and Fellow of the British Academy.

The workshop's purpose was to discuss current and previous activities of the European Commission with regard to embedding and further shaping the SSH dimensions in the 2016-2017 Work Programme. At the workshop, the Commission sought concrete input from selected European SSH stakeholders on possible ways to integrate interdisciplinary approaches in the Horizon 2020 programme, in particular through the embedding of SSH research into the "Societal Challenges".

Participants from the scientific community emphasised that the calls for research funding need to be improved and formulated in such a way to encourage interdisciplinary work that includes SSH researchers and SSH research dimensions from the outset. A disconnect was noted in which social issues are often clearly identified but ultimately neglected in the texts of the proposed calls. Participants also discussed the need to think beyond technology in terms of identifying solutions for certain challenges that have great social implications. The ways in which the social sciences and humanities can contribute to technology development and innovation in general were also considered, with the ultimate goal being that the SSH play a vital role in consultation and governance of the Horizon 2020 programme as well as measuring societal resonance and impact.

During the workshop, participants also met representatives from the Commission's internal network of SSH liaison officers dealing with the practical implementation of the embedding

approach. "The stakeholder workshop provided an excellent and unprecedented opportunity for hands-on exchange between representatives from the SSH communities and European Commission policy-makers", said Dr. Julia Stamm, senior policy officer at the Directorate-General for Research and Innovation unit "Reflective Societies", which organised the workshop. "Both sides shared their commitment to improve the integration of SSH research dimensions by focussing on where SSH perspectives are needed in order to fully address the challenges at stake.

At the end, it was agreed that the focussed exchange had been most constructive and that a continuation of this format would be beneficial in the run-up to the strategic programming". Exchanges like this stakeholder workshop are thus vital to facilitating communication between policy-makers and the scientific community and further similar opportunities for stakeholder communication should be encouraged and pursued.

WG E-Humanities meets at Swiss Academy of Humanities and Social Sciences

The Working Group E-Humanities met on 4 December at the Swiss Academy of Humanities and Social Sciences. The group discussed its goal for 2015 to continue its engagement and consultation activities with the European Commission and the Research Data community.

In the past, the WG has provided contributions to the European Commission's ERA Charter for Access to Research Infrastructures, Science 2.0, and the Joint Research Centre. The WG also contributed to the Research Data Alliance Europe Forum's new report "[The Data Harvest: How sharing research data can yield knowledge,](#)

[jobs and growth](#)", which was released in early December. The report builds upon the data market landscape described in the 2010 report "[Riding the Wave](#)", which outlined policy recommendations regarding how Europe can benefit from ever-increasing amounts of scientific data. The new report offers an update on the previously described landscape and argues that Europe must act immediately in order to preserve and secure its position in future data markets while outlining benefits, challenges, and recommendations for European policy-makers.

The WG also plans to continue its engagement with the Survey and Anal-

ysis of Basic Research in the Social Sciences and Humanities at the Science Academies of Europe (SASSH). The SASSH coordinator attended the meeting to discuss the survey results, which will be published in May 2015, as well as the implications of these for a potential follow-up digital research infrastructure project based at the academies. The WG will likewise continue its cooperation with DARIAH, the pan-European Digital Research Infrastructure for the Arts and Humanities. A major part of the Bern meeting was devoted to creating an action plan for the preparation of a Digital Humanities report which will be published and launched in mid-2015.

Joint Meeting of ALLEA Permanent Working Groups Science & Ethics and WG Intellectual Property Rights (IPR)

Following up an agreement made at the ALLEA General Assembly in Oslo (April 2014), the two ALLEA permanent working groups on Science & Ethics and on Intellectual Property Rights (IPR) held their very first joint meeting in Munich on 24 November 2014.

The meeting sought to provide opportunities for closer interactions between the expert groups and to identify fields of mutual interest and for synergetic cooperation. It took place on the premises of the Max-Planck Institute for Innovation and Competition on the invitation of Professor Joseph Straus. ALLEA President Professor Günter Stock also joined the meeting for a discussion on possible cross-cutting issues that the working

groups could jointly address in future activities. The Board was represented by Professor Carlo D'Adda.

The issues for possible joint actions included a follow-up to the statement "[Enhancement of Open Access to Scientific Publications](#)", prepared by the working group on IPR in late 2013, elaborating positions on most recent developments in the Open Access agenda and particularly adding deliberations on ethical issues to the existing ALLEA statement. Additional topics included the patentability of stem cells and the risks of dual use of scientific results. The Working Group chairs planned to take the results and proposals of the joint meeting to their respective groups in order to discuss

and agree upon how to concretely contribute to the envisaged future activities.

Possible further topics of discussion were proposed, including conceptual, legal and ethical aspects of property rights as well as informed consent. The chairs of the permanent working groups, Professor Göran Hermerén (Science & Ethics) and Professor Joseph Straus (IPR), closed the meeting in affirming the shared interest to continue the direct collaboration of the ALLEA groups. The first results of the collaboration are envisaged to be presented at the ALLEA General Assembly in Lisbon.

WG Science & Ethics releases Private Sponsoring Statement

The ALLEA Permanent Working Group on Science and Ethics (PWGSE) has released a statement on "Private sponsoring in the science enterprise, trust in science and academic freedom" that includes the legal provisions for academic freedom in the ALLEA member countries.

The statement, initiated by the Swiss Academies of Arts and Sciences and reviewed by the ALLEA Working

Group, emphasises that public confidence in science relies on the credibility and integrity of scientists and their work. Academic freedom, without undue interference from third parties, is a key factor in that regard. The importance of academic freedom in the conduct of science is evidenced in legal texts at both the national and the supranational level (e.g. the Charter of Fundamental Rights of the European Union), annexed to the statement.

concern regarding the trustworthiness of scientists and their scientific advice. To ensure scientific autonomy and credibility, the statement makes recommendations for scientific institutions in the handling of private sponsoring, notably for university chairs, suggesting four key framework conditions that should be applied:

1. Transparency on the contractual regulations between donor and recipient;
2. Exclusion of influence of donors during appointment procedures;
3. Equal appointment procedures for privately and publicly funded chairs;
4. Explicit affirmation of academic freedom in teaching, research and public engagement.

The statement is available for download [here](#).



Members of the PWGSE

During the last few years, private sponsoring in the scientific enterprise increased and gained in importance, thereby affecting academic freedom and the public perception of the independence of scientists and their work. While the statement concurs with the need for private sponsoring for scientific research, it expresses

The next issue of the ALLEA newsletter will be published in early summer and will reflect on the 16th annual ALLEA General Assembly.

Professor Sierd Cloetingh, President of Academia Europaea, has been appointed Vice-President of the European Research Council. He is Professor of Earth Sciences and Tectonics at Utrecht University. Additionally, Professor Mart Saarma of the University of Helsinki has also been appointed Vice-President. Professor Cloetingh will be presenting a lecture on 23 April at the Scientific Symposium in the context of the ALLEA General Assembly. Click [here](#) to read more and download the preliminary programme.

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