

PhDs of the 21st century (PhD21)

Idea being presented

‘PhDs of the 21st Century’ (PhD21) aims to lay down a set of standard guidelines for graduate schools, courses and students to promote better scientists for a better world.

The goal of PhD21 is excellence in graduate programmes based on skills and competences required for PhDs to act beyond academia in order to contribute to the development of their societies.

Nations that are leading the technology and innovation revolution have a rate of PhD graduates per inhabitant far above the world’s average. Even though science education is imperative for long term sustainability of a nation, it is the critical mass of scientists that can produce the innovation to break up with unsustainable technologies and practices.

However, the growing production of PhDs in developing countries like Brazil and China has raised concerns about the quality of those scientists. The Bologna Protocols are a set of requirements to reach academic excellence among European universities that could be shared around the world. However, training for academia has not prepared a scientist that is able to fully fulfill what society expects from these professionals.

We believe that, besides the traditional competences in research and education, PhDs need training in innovation, communication, diplomacy and policy.

Our mission will be to push the frontiers of science training for inclusive prosperity and well-being of nations and societies.

Description of the foreign/regional/global implications, challenges or benefits

The common language of science has always been a safe harbour for diplomats and governors to rely on. Despite social and cultural differences among nations, which can even lead to conflicts, science is independent of race, gender, nationality and social status.

In a world where sustainable development depends heavily on the ability to deal with information, understand science, produce innovation and turn it into technology, only a strong investment in science can reduce inequalities between nations and truly include the whole population, both socially and economically.

As science develops, scientists are much more needed not only to carry out scientific activities, but also to produce innovation and more importantly to translate their activities to the general public with tax payers money, inside universities, research centres and also elsewhere.

However, very often, inequalities between countries make it difficult to attend to strict scientific criteria, risking the production of second class scientists. Some other times, the focus is on

producing scientists only for academia that are able to comprehend and apply the scientific method, but their research works are far from the cultural, social and economic demands of their societies.

However, the challenges of the 21st centuries, regarding food (crops), environment (including biodiversity and climate change), water management, health and energy, are more and more borderless and have to be approached by scientists that can collaborate to create collective solutions for common problems.

A PhD education that extends the borders of traditional training focused in academia will provide the basis for these scientists to work beyond academia towards a more informed, included and integrated society. And from there, to work together with scientists from other countries, even those in direct or indirect conflict, in facing common challenges.

What is needed to address the issue (for example infrastructure, meetings, agreements, new funding streams)

Sponsors: Scientific societies, academic and business associations, ministries of science and technology and education (and possibly foreign relations), foundations.

Meetings: between the managing committee, science, education and policy experts.

Access to key people and data: Bring contributions from people that have approached some of the questions that we will face, like Prof. Hans Rollings from Sweden, who has created impressive visualization systems for big data, and Sir Ken Robinson, who has discussed how school is killing creativity.

Virtual platform: This will be a resource for the managing committee, science, education and policy experts to discuss the guidelines, and after that open it up for everyone that is interested to contribute.

What the role of the science community is in the issue

To discuss and establish the guidelines. Nowadays, science has a strong influence on what were previously considered to be social sciences like psychology and pedagogy. Neuroscience explains a lot about how we think, act and learn. Scientometrics and social statistics have a determinant role in defining public policies. Natural and social scientists will get together to establish guidelines based on scientific criteria.

What the role of the diplomatic community is in the proposal

To acknowledge and promote the guidelines. Even though scientific criteria should be independent of nation, the ability and opportunities to apply these guidelines can, in many countries, be limited or restricted. It is fundamental that the diplomatic community be engaged for their government to incorporate the values of the PhD21 and offer their scholars and students the opportunity to be acknowledged by their peers everywhere.

What steps are needed to implement the idea

The first challenge is to find an association (or more than one) to sponsor the idea and lend their support to a Multi Meta Association Committee for the PhD21.

Instead of finding direct funding for the programmes, we'd rather suggest that interested parties contribute from within their own budgets to the different initiatives of the group (meetings, events, trips, virtual platform for data sharing).

The first step would be to create a virtual platform of compiled data on PhD, innovation, science education and other data from sources like the OECD and UNESCO. This platform would be used to make the data available in different formats to contribute to the understanding and implementation of the guidelines.

Panels of science, education and policy experts could come together online and in person (according to availability and resources) to discuss the guidelines.

Pilot experience to implement the guidelines in the Middle East and verify how they could be used to bring together countries with complicated diplomatic relationships but common environmental problems (like water resources or energy) through multinational PhD programmes based on the PhD21 guidelines.

After the guidelines are decided, the written report on the relevant data for the PhD21 is ready; a TEDx talk would be organized to share the experiences and conclusions with the world.

Finally, in the future, the platform could be the basis of massive open online courses (MOOC) that would teach the skills that we promote.

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These authors comprised one of the breakout groups of the AAAS-TWAS Short Course in Science Diplomacy, held in Trieste, Italy, from 8-13 June 2014. This paper is a summary of discussions that occurred within the group.

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