

Your choice, you and the others:

Networks of Opportunity and our common goods in times of uncertainty

Manuel Heitor

Carnegie Mellon University's Honorary Doctor of Science and Technology, 2022

Brief note to support a keynote speech at

Carnegie Mellon University's Commencement ceremony for Masters and PhD students 2022

Friday, May 13

I am very honored to be with you today for your commencement at **one of the finest universities in the world.**

Master and PhD classes of 2020, 2021 and 2022, **You should be extremely happy and proud of your achievements and milestones. Very Well done!**...

But, above all, **Be happy:**

- this is not the end.
- Your journey is just starting. You are **now empowered to lead the future.**
- We are all in "your hands". **We are here because we trust you and your generation.**

Your families and friends are certainly very proud and honored to be with you today celebrating your accomplishments and you should feel uniquely accomplished that you made their dreams come true. Well done!

And the **Carnegie Mellon faculty, staff and community are certainly proud for educating you, working with you and learning from you. You are now empowered to "lead our common future".**

I acknowledge all of those that have made **Carnegie Mellon one of the world leading universities** able to **attract you and the support of your families.**

This is the university where past and present faculty and alumni include over **20 Nobel Prize laureates** and so many **brilliant minds across all disciplines**, including **John Nash**, a world renown mathematician, **Andy Warhol**, one of the most disruptive world artist of the last century.

Being here today is a unique experience, that I share with all of you. Students, families, friends and the CMU faculty and communities.

I thank **President Farnam Jahanian and the CMU faculty for awarding me the Honorary Doctor of Science and Technology** and acknowledge my colleagues in the podium that are also recognized today with CMU's honorary degrees:

Frances Arnold

Jody Daniels

Evelyn Higginbotham

Billy Porter

Raj Reddy

Jim Rohr , and

Anna Deavere Smith

I believe that the main reason for being awarded this degree is that **I have always behaved as a student, as a “learner”. And I strive to continue to do so.**

I was born in a school environment and **I learnt a lot from my parents, from their parents and from their grandparents - all educators and professors.** And I learnt even more **from my peers,** and much much more from **my students and from their students.**

From my experience of more than 12 years in the government of Portugal, **I learnt that we all benefit by guaranteeing that everyone is entitled to new knowledge-based opportunities, however isolated and underprivileged one might be.**

I also learnt the importance of creating **networks of opportunity** for everyone. Under this premise, we partnered some 15 years ago with **Carnegie Mellon in a joint venture** and, today, we are proud that this partnership **is recognized as a great success.**

Portugal is a small and old European country, with a troubled colonial history, glorified under a dictatorial regime for half of the 20th century. That regime survived for so long by repressing freedom, oppressing the youth and keeping it under-educated. **But this year we passed an important threshold: proudly celebrating more days lived in democracy than those lived under the dictatorial regime.**

Today Portugal **has one the most educated young European populations** and a flourishing entrepreneurial spirit, with **one of the highest concentrations of unicorn firms in Europe,** being now a world reference for engineers and computer scientists, writers, architects and artists.

As a *learner*, I strive to **team up with the best in the world, and this is what I found at CMU: The ability of world leaders to work together, across disciplines, through a unique transdisciplinary and interdisciplinary landscape, from the arts and humanities to exact and natural sciences, including engineering, business, computer science and public policy.**

I would like to extend a very special thanks to **all of those that I met at CMU over the last 25 years.** In particular, let me thank again **President Farnam Jahanian,** but also the previous **Presidents that I worked with, Jerry Cohon and Subra Suresh.**

Also, **former provost Kamlet** and current **Provost and former Dean of Engineering Jim Garrett** and **former Dean of Engineering Pradeep Khosla.**

Through them, **I acknowledge all CMU’s faculty, alumni and students.** And, in particular, I must refer to two very special people I had the privilege to work with very closely and meet over the last 25 years: **Granger Morgan (EPP) and José Moura (ECE),** both Institute Professors.

This is what I have learnt from all of you: To strive to find the best world leaders and work with them.

This is the best recommendation that I can give all of you, based on my own experience: **Team up with world leaders and keep learning together!**

Master and PhD classes of 2020, 2021 and 2022, **across all disciplines,** from the Arts and humanities, to natural and exact sciences, engineering and computer science, social sciences, business, law and policy studies, **value what makes you unique, but learn how to work together and find common ground.**

When I finished my post-graduate studies in the US, some 35 years ago, the future seemed brighter than today. It was the time of the **fall of the Berlin Wall and the end of Cold War,** Portugal was already a full democratic country and had joined the European Union, the **internet was exploding and the roots of web2.0 were being launched,** together with **global market integration.**

But now **you face big uncertainties and unique challenges** - climate disaster, pandemic, war, inequality, attack on basic rights, changes in the labor market, fake news, to name a few.

We trust you to face and address these challenges and do better than my generation; that is, to leave to your own children a world better than the one you inherited from my generation.

Let me briefly convey **three main messages to all of you.**

1. Message 1: Keep learning, by being ambitious and innovative. Change the world, making use of your knowledge, but guaranteeing that all others are also ambitious and innovative

Guarantee that **“Your parents and the parents of your friends really don’t understand what you are doing!”** ...

The number of young adults who are able to say **“My parents really don’t understand what I’m doing!”** about their work is probably the best indicator of progress in any society. **It means each generation explores new things, and has the collective opportunities to do so.**

Many highly industrialized or emerging environments worldwide would score high on this index. Certainly in many leading Universities worldwide, such as Carnegie Mellon, as well as in many fast growing cities, such as São Paulo, Seoul, Shanghai or Singapore, to name a few, but also in many American and European leading regions, many parents, even those skilled professionals or scientists, can only shrug and laugh when asked to explain their children’s careers. That is a healthy sign. It is a **generational changing movement in a dynamic and continuously learning environment.**

Start with and work on your own ideas, invest on them, do and insist on research, exchanging views with others and test and validate them, until you have a greater idea, scientifically sound and socially adequate...

Insist, change and move forward with purpose...

Have purpose!

But, as you know, **the very best ideas require a lot of sweat.** They are the result, often, of accidental mistakes, thousands of other ideas and much social interaction, **as well as continuous research work.**

In other words, **build upon and expand your unique networks developed while here at CMU and spur new ideas that will improve the life of others ...**

And, by doing so, **guarantee that all others are also ambitious and innovative.**

Invest in future generations and help build an intergenerational movement that favors science and knowledge-based ideas that change the world.

Following an argument by the great opinion maker Thomas Friedman¹, **the investment in our universities and collective institutions and opportunities is the only way to mitigate the staggering income inequalities that continue to arise everyday.**

Another great best-selling author, **Timothy Ferris**, argues in **“The Science of Liberty”**² that the **development of our societies did not emerge from some amorphous “thinking”**, but rather they have

¹ Friedman, F., “Do You Want the Good News First?”, New York Times, May 19, 2012.

² Ferris, T. (2010), “The Science of Liberty: Democracy, Reason, and the Laws of Nature”, New York, Harper/HarperCollins Publishers.

been strictly connected and were **“sparked” by the arts and sciences themselves** — the crucial “innovative ingredient” that “continues to foster political freedom today.”

Ferris reminds us that the **arts and science were an integral part of the intellectual equipment of the great pioneers of political and individual liberty** and, for example, he finds in the United States Constitution the underlying principle that citizens should “be free to experiment, assess the results and conduct new experiments.”

To **rely on experiments is to doubt authority, to cultivate self-awareness**, to seek the reality behind natural appearances and installed opinion. And although scientific research, as we know it today, is still the work of an elite community from which most people are necessarily excluded, **its founding principles are closely linked to our understanding of democracy.**

But, as also clearly shown by Ferris, it only happens and is effective **under a fully democratic and open societal context. It is our common duty, as learned individuals, to guarantee our democratic future, with more science and better science, but always with better democracies.**

Learn from the mistakes of my generation and innovate in a responsible way.

2. Message 2: Keep learning, by being responsible, green and inclusive across all disciplines

Understand emerging collective behaviors and our common responsibility to secure the life of future generations in times of emerging decentralized digital networks and AI enabled innovations

The **digital world is undergoing rapid transformations and expansion** at a global scale, with new business models and new players, emerge new relationships between institutional sectors and a broad range of entrepreneurial activities.

At the same time, you all, as **citizens of the world, face increasing challenges and opportunities and your quality of life and sustainable future** is only to be secured effectively through a new generation of user-driven technology systems, that make **citizens an integral part and key stakeholders of future developments.**

Concentrate your efforts on the need to guarantee carbon neutrality, addressing the impending climate disaster, as well as **our global safety**, this being the central endeavour that **should drive technology governance in the digital age.**

This calls our attention to **“digital humanism”³**, together with rethinking potential techno-centric narratives of progress, embracing and harnessing **uncertainty^{4,5}**. Following the great Swedish social scientist, Helga Nowotny, I urge you to abandon the fantasy of control over nature and the illusion of techno-centric dominance of digital systems and AI-enabled innovations⁶.

Adopt and pursue a **transdisciplinary approach to collective behaviors⁷**, so that you and all other citizens are better **responsible** in an emerging **decentralized digital age.**

3 Nussbaum, M. (1997) *Cultivating Humanity: a classical defense of reform in liberal education*, Cambridge: Harvard University Press.

4 Nowotny, H., Scott, P., and Gibbons, M. (2001) *Rethinking science: knowledge in an age of uncertainty*, Cambridge: Polity.

5 Morgan, M.G. and Henrion, M. (1990), “Uncertainty: a guide to dealing with uncertainty in quantitative risk and policy analysis”, Cambridge Univ. Press, Cambridge, New York.

6 Nowotny, H. (2021), “In AI we Trust: power, Illusion and Control of predictive algorithms”, Polity Books.

7 Bak-Coleman, J. B., Mark Alfano, Wofram Barfuss, Carl T. Bergstrom, Migue Centeno, Iain D. Couzin, Jonathan F. Donges, Mirta Galesic, Andrew S Gersick, Jennifer Jacquet, Albert B Kao, Rachel E. Moran, Pawel R Omamnczuk, Daniel I. Rubenstaein, Kaia J Tombak, Jay J Van Bavel and Elke U weber (2021), “Stewardship of global collective behavior”, PNAS, June 21, 2021.

To save lives, predict natural disasters, prevent fires, control erosion of coastal areas, as well as provide quality food and services for all. This is to be secured effectively through a new generation of user-driven, low-cost, space-based observation and human-based participatory systems, with adequate resources that can only be obtained if **citizens become an integral part of future developments**.

Dealing with climate change, dramatic biodiversity reduction, health and economic crisis, uncertainty and risks, together with ensuring security and safe conditions for our populations is to be addressed if **new digital initiatives move forward in full alignment with a required green transition**.

3. Message 3: Keep learning, by being human and fostering solidarity: your choice, your body, your mind with your knowledge and our common scientific understanding, guaranteeing that all others have the same opportunities to their own choices and their own bodies

Making your own decisions about your body is a basic human right.

Whoever you are, wherever you live, **you have the right to make these choices without fear, violence or discrimination**.

Acknowledge your privilege, fight oppression with ambition, knowledge and solidarity, empower the younger and less privileged.

Recalling “The Science of Liberty”⁸ of Timothy Ferris, **democratic governance and individual rights did not emerge from some amorphous “brew of humanistic and scientific thinking”**. Rather, **they have been strictly connected and were “sparked” by science itself**.

And science tells us to strongly connect your choices to your body and your mind.

Yet, all over the world, **people are bullied, discriminated against and arrested, simply for making choices about themselves and their lives**. Many women are refused contraception. Many teenagers are denied a life-saving termination. LGBTQ+ communities suffer continuous harassment.

You all, future world leaders, educated in one of the finest world university, should ensure that every minority group is respected.

Be active!

CAMPAIGN for basic rights for all – sexual and reproductive rights, voting rights - FOR ALL

Concluding Remarks: the opportunity to engage in learning and knowledge networks

Let me conclude by referring to Nobel Prize-winning economist Edmund Phelps⁹, who argued that **our societies have gained and used an enormous pool of *reliable knowledge*, driven by a research community that made our universities robust social institutions**, as clearly shown by Carnegie Mellon University.

⁸ Ferris, T. (2010), “The Science of Liberty: Democracy, Reason, and the Laws of Nature”, New York, Harper/HarperCollins Publishers.

⁹ Phelps, E. (2013); “Mass Flourishing: How Grassroots Innovation Created Jobs, Challenge, and Change”, New York, Princeton University Press.

Recent unexpected threats to our common safety and public health, such as the Covid-19 pandemic, the increasing activity of individual digital terrorism, or the Russian invasion of Ukraine, have shown that **our societies are not as safe as we thought**.

Any deep reflection on these issues **must lead us to safer, more resilient forms of digital governance that must necessarily be centered on people and based on collective knowledge**.

Take up the challenge of probing deeper into the relationships between knowledge and the development of our societies at a global scale across the arts, the humanities, the natural sciences and the exact sciences and engineering.

By challenging the commonplace, you will be able to promote the simple, but powerful, idea of learning.

Speak of a “**learning economy**”, not just of a “knowledge economy”. The fundamental difference being a **dynamic perspective**. There is both knowledge creation and knowledge destruction. By forcing us to look at the process, rather than the mere accumulation of knowledge, we add a dimension that makes the discussion more complex and more uncertain, but also more interesting and intellectually fertile in an international context¹⁰.

Take seriously your unique opportunity to access and engage in learning networks across all disciplines and relate to interactions between people and organisations, which influence economic development and political relationships¹¹.

Learn from the mistakes of my generation and innovate in a responsible way.

Following **José Saramago**, the Portuguese Nobel Laureate of literature in his Nobel speech, “[...] **Let us common citizens therefore speak up. With the same vehemence as when we demanded our rights, let us demand responsibility over our duties. Perhaps the world could turn a little better. [...]**”

Master and PhD classes of 2020, 2021 and 2022, **we are here because we trust you and your generation. Again, acknowledge your privilege and learn from past generation’s mistakes to do better. Be bolder, be kinder, be more responsible!**

Move forward!

I sincerely appreciate all your attention.

Manuel Heitor

¹⁰ Lundvall, B.A: (2011), “The Changing Global Knowledge Landscape and the Need for a Transatlantic Vision and a New Pragmatism”, Aalborg University

¹¹Hidalgo, C.A. and Hausmann, R. (2009), ‘The building blocks of economic complexity’, Proceedings of the National Academy of Sciences of the United States of America, vol. 106, no. 26, pp. 10570-10575.