How do we keep up with the pace of the world?

Ladies and gentlemen

It's all hands on deck. How do we keep up with the pace of the world? Society is changing, probably faster than ever before. What is driving all these changes? There's a lot of talk about globalisation and digitisation. And talk about the big issues: about the climate and the energy transition, about resilient societies, about mental health.
These changes naturally lead to new research questions.

The most obvious way of tackling these 'big' issues is the interdisciplinary approach. A few years ago, LERU[1] published a paper on this: about the importance of recognising interdisciplinary research, the structural obstacles, drawing attention to how this was not being given enough recognition. To be sure, we can point to some good and impressive examples. Half a century ago, Chomsky already built a bridge in his remarkable research between linguistics and neuroscience. But at the same time, LERU concludes that interdisciplinary research has not really blossomed yet.

The interdisciplinary approach is often seen as belonging to an applied domain. A solution to a societal problem. But by putting the focus on 'fast' solutions we run the risk of missing an essential point, namely that the change is leading to many new and *fundamental* issues. And it's precisely this fundamental research that remains the most important component of groundbreaking strategic research. In other words, fundamental research and scientific depth are essential for solving complex problems, the 'wicked problems'.

So the point I want to make today is: we need new and fundamental research in an interdisciplinary context. I'll address four points here.

- Firstly: the right positioning of our 'academic' role
- Secondly: the new nodes and innovation in research, in research methods and imagination that is required to achieve this
- Thirdly: the consequences this will have for our teaching
- And finally: the need for broad involvement by society, because science must be brought to life.

First of all, the right positioning
The solution to the societal challenges are of a systemic nature and so research should also lead to insights into interdependent relationships.

Let me explain this a little more.

The French philosopher Bruno Latour points in his work to the importance of interactions between people and things[2]. This new emphasis has important consequences. The world becomes a world of interaction in larger networks. We need to better anchor this principle in our academic research. The systemic perspective is important here. Complex systems also have their own dynamics, mutual dependencies and critical transitions. Predicting these transitions or changes requires a new approach.

In a society where science and politics, nature and culture, people and things are interconnected, it's also important to look ahead. Change is embodied in the systemic nature of the research questions and their interdependencies. This means that imagination is required[3]. And that in turn leads to new knowledge questions, not only about 'what is' but also about 'what will be'.

And of course our view of the past will also become very different. To give one example, in the European

project 'The Time Machine', the researchers are using Big Data from the 17th century to examine established assumptions about culture and identity and thus to gain a better understanding of contemporary issues such as migration, gender equality and also how one deals with new technology from a more long-term perspective.
In other words: the research also requires a look ahead, to a predictive value.

My second point, innovation of research methods
Research methods are the basis for scientific research. They vary from discipline to discipline, they are recognised by the involved scientific community for the discovery and analysis of facts. These facts are then confirmed by other scientists within and outside the discipline. A precise, consistent, independent way of working is essential in order to gain new insights, to reveal new facts and new truths.

An interesting discussion is currently underway in the IAS about the various methods used by the broad spectrum of scientists. This is leading to new insights about what good science actually is, but above all to a better understanding of how other disciplines carry out research. This is necessary because research questions are no longer confined to a single discipline. Here I would like to advocate a stronger focus on innovation of research methods. In order to help renew science, but also as a way of finding solutions for complex societal problems, the 'wicked problems'.

Luckily there are some good examples of this, and I'll quote two of them here:

Social choice theory is a centuries-old research field that examines the relationship between individual choices and group choices. It combines traditional fundamental mathematics, economic and political sciences. The research field has produced several Nobel laureates. For the connoisseurs, it was also one of the research fields of Lewis Carroll (just to invoke the imagination here – he published under his real name of Charles Dodgson).[4]

Digitisation and the rise of the algorithm has given this domain a whole new lease of life. You can use an algorithm to describe the mechanisms of negotiation and decision-making. No need to stress that the results of this kind of research will have a major impact on our society: about how we take decisions, how we arrive at standpoints, or more generally how polarisation develops, be this intentionally or unintentionally.

And a second example:
Macro-economic standard models mostly assume rationality, but today we know all too well that people and markets are often anything but rational.

So what can we do, with the help of data and our current knowledge of complex systems?

Behavioural models with multiagent structures introduce a new dimension. Sometimes individual behaviour leads to stable behaviour and balance on the market, but often individual herd behaviour also leads to violent market fluctuations at the macro-level.[5] Or in other words: modelling non-rational behaviour is an important innovation in understanding and solving economic issues. Economics, social scientists, epidemiologists, financial specialists and mathematicians work together and make new discoveries. These methods are leading to new research domains within behavioural economics.

It's not the easiest path for the researchers. The use of different methods in an existing discipline often needs more time to be accepted in the leading journals. But it's possible. You can win a Nobel Prize in this way. Think of Esther Duflo, who was recently awarded the Nobel Prize for Economics. She pushed back boundaries with her original experimental research on poverty with randomised controlled trials, a research method that – as you undoubtedly know – is used in the medical field for testing drugs. This is a fundamental innovation, applied in a complex reality, aimed at a societal problem.

And finally my last point: science must be brought to life:
This relates to our task as a university in dialogue

with society. New research questions lead not only to new knowledge and facts but also to debate, both within the university and outside it. This role, this aspect of our work, requires special attention.
It's something we can all bear witness to: the participative internet culture has changed the way public opinion is formed.[6] A platform for information is also a platform for unintentional or intentional disinformation for those who believe they can gain an advantage in this way.

We can all see how facts and opinions can be scrambled up, sometimes unintentionally, sometimes with clear intent. How fact-based knowledge can, in a one-sided and blatant manner, be thrown into doubt or simply denied.

Let us be vigilant in order to ensure the legitimacy of fundamental knowledge. Recent data indicates that trust in science and in scientists is still high. In order to maintain this, it's important to build a bridge between science and citizens.

Or in other words: to bring science to life.

We need to explain how science works, how knowledge is created through careful methods, through collaboration and competition. This is something we need to be open about. And at the same time we need to increase our focus on society in all its breadth. This too is part of our task. Focusing on preventing diseases of affluence. Or focusing on reducing inequality of opportunity. New initiatives such as citizen science can be a fantastic addition and also fit into our plans for societal involvement by students. Jean-Pierre Bourgignon[7], the leading figure of the ERC until a few weeks ago, puts it this way: *'..scientists have an enhanced role to play as social actors' […] 'the long-term answer therefore seems to be to educate people better, to bring science closer to citizens and to ensure science addresses issues of relevance to people, that have an impact on their lives.'*

Ladies and gentlemen, I'm now coming to the end of my story.
How do we keep up with the pace of the world, that's what I asked myself. By intrinsic renewal and debate. By connecting with society. And by innovation of our fundamental research methods and innovation in teaching.
We take this perspective at the University of Amsterdam. Let's make full use of it in the coming years.
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References

- Wernli, F. Darbellay, K. Maes 'Interdisciplinarity and the 21st century research-intensive university' LERU Feb. 2017
- See for instance: Bruno Latour: *Waar kunnen we landen*
- Huub Dijstelbloem *Het huis van Argus: de wakende blik in de democratie*, published by Boom 2016.
- Handbook of Computational Social Choice © 2016 Felix Brandt, Vincent Conitzer, Ulle Endriss, Jérôme Lang and Ariel D. Procaccia, Published 2016 by Cambridge University Press
- Stefano Battiston, J. Doyne Farmer, Andreas Flache,4 Diego Garlaschelli, Andrew G. Haldane, Hans Heesterbeek, Cars Hommes, Carlo Jaeger, Robert May, Marten Scheffer, Science, Vol. 351, Issue 6275 p. 818
- Billiet, De strijd om de waarheid – over democratie&desinformatie in de digitale mediawereld" KVAB, Belgie 2019, J.van Dijck jaarrede KNAW 2018
- Jean-Pierre Bourgignon, Allea 25th anniversary symposium, May 2019