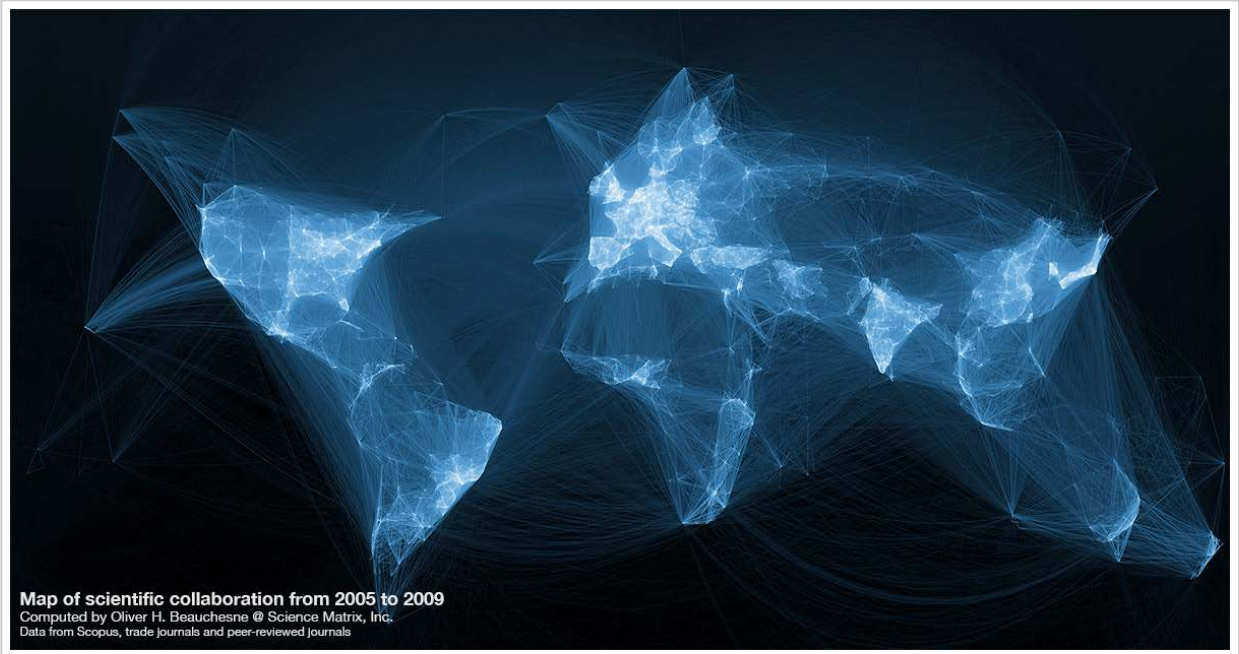
Week 5: Global Framings, Global Knowledge Production & The University

Help



This striking visualization depicts scientific collaboration, as indicated by co-authorship, around the globe over the years 2005-2009. Click on it and see the full size version, courtesy of the analyst who developed it, Olivier H. Beauchesne, and look even more closely.

Now, we're curious about your reaction to this mesmerizing visualization. What's going on here? Quickly jot your initial thoughts down.

So what caught your attention? Did you focus on the denser white lines in comparison to the less dense/darker spaces? If so, what were you thinking?

Perhaps you drew the conclusion that there is nothing 'global' about these collaborations. Rather, scientific knowledges have been produced in very uneven ways: mostly in the large cites of Europe and North America, with connections into other larger cities of Latin America, Asia and Oceania. Though the case of New Zealand looks a fascinating one!

Or perhaps you were drawn to the idea of collaboration (both national and international), a research practice that has steadily grown in importance over the last two decades. On this issue see, for example, Science Europe and Elsevier's report *Comparative Benchmarking of*

European and US Research Collaboration and Researcher Mobility (September 2013), or the Royal Society's excellent *Knowledge, Networks and Nations* (March 2011).

It is also interesting, for example, to reflect upon the data used to construct this visualization, knowing that knowledge is increasingly regarded as something that is a competitive advantage, ideally shared through international refereed (IR) journals.

Or perhaps you jotted down thoughts on the politics of 'this kind' of *representation*. Why represent scientific collaborations like this globally? What work is this kind of representation being asked to do, and for whom? What disciplines are likely to be captured in this kind of representation? Sciences, arts, humanities?

These kinds of global representations are increasingly common in talking about a *global knowledge economy*. In this account, universities are seen as having a central role in creating and circulating knowledge globally.

A Global Knowledge Economy

When did the *global* knowledge economy emerge as a **big** idea, and how did it become so?

Over the past decade an avalanche of reports, scenario planning, conferences, new data collection exercises, and ways of mapping, measuring and representing levels of knowledge production and relative 'competitiveness' have been released by governments, industry bodies, research councils and international and multilateral organisations. See a sample of report covers from some of these mappings below.

All are arguing, or forcefully implying, that the *only* way for a country to ensure its future economic security in a global world is to become 'knowledge-based.' Of course the nature and impact of this agenda varies across time and space, but in a broader structural sense, this line

of argument is clear and purposeful.

In dominant framings, countries are encouraged to give greater numbers and proportions of students access to higher education, especially in science, engineering and mathematics. Nations are called to invest in high-end research and development, promote enterprise and entrepreneurial skills, explore direct engagement with industry in order to promote knowledge flows across boundaries, and incentivize international collaborations amongst scientific groups. Not meeting these targets is tantamount to national suicide!

As we will show when we focus on a couple of UK and US reports on these issues, the language in many of these reports is highly emotive, and our urgent attention is demanded. And please note that we are deliberately, not accidentally, focusing on the UK & US in much of this class as they are, in many ways, some of the drivers of the global production of widely circulated knowledge, for good and for bad. The US, via the development of global knowledge production spaces/models like Silicon Valley, generates all sorts of demonstration effects as well. Given this, it is important to pay attention to what is infolding in these countries, and their higher education and research systems, for their actions, framings and models lever structural change on in many other countries.

These days, being globally competitive means: (i) having at least one university ranked in the top 50 or 100 of one of the world-class university rankings; (ii) having 15-year-old students performing well on the OECD's Programme for International Student Assessment (PISA); (iii) monitoring investments in research and development as a percentage of GDP; and (iv) making sure we are at least as good as those we believe we are competing with. It is a race! And a global race! And there is only one way to go, and that is to the top!

To ensure that we know how this race is going, policymakers have been fashioning a range of tools to measure and make visible different dimensions of being globally competitive. Benchmarking tools, scorecards, and indexes—all offer us a view of ourselves in relation to our main competitors in the world, the region, and so on. These different tools generate momentum in the system, as nations, institutions, and individuals get drawn into their logics and in turn draw in others. Increasingly, we understand our local settings in relation to this global knowledge economy.

Putting Knowledge at the Center of Economic Development

It is all very well to proclaim that knowledge now stands at the centre of the new economy, but you would be right to be puzzled by this claim of novelty. When, you might ask, was knowledge *not* central to our work? And you're mostly right.

But there are important differences between the past and now. In general, recent developments emphasize the following elements:

1. *Constant and flexible learning* so as to generate new ideas around products and services;
2. *Learning about learning*, or *reflexivity*, creating new insights and knowledge into who knows what, who, where, how and why;
3. *Science and mathematics*, seen as driving profound innovations in a society;
4. *Interaction* with others so that new learning can take place;

"You are in a constant state of discovery."
Wisconsin Institutes for Discovery, UW-Madison

5. Interaction with others so as to access *tacit knowledge*;
6. Connecting advanced knowledge producers (e.g. universities and industry) through *partnerships* and other forms of interaction to solve industry problems; and
7. The *speed* at which ideas can be taken to the marketplace ('ideas to invoice').

Speed, mobility, constant learning, flexibility, interaction, creativity and reflexivity are the buzzwords in this new economy. However, you should also note the contradictions between these dynamics and dispositions, on the one hand, and what you will begin to see as the tendency toward a convergence of agendas and one-size-fits-all solutions, on the other.

Some key thinkers have been influential in shaping this development trajectory. Their insights into knowledge, innovation and economic growth help us appreciate why certain policies—researcher mobility, collaborations between research teams across the world, university-industry linkages—are fashionable. We've developed a summary of the key assumptions and mechanisms at work that you might find useful (see Box 1). You might also ask yourself whether this is simply pure ideology at work, or is there something *real* there that these assumptions are based upon?

Box 1: Assumptions and Mechanisms in Realising Global Knowledge Economies

Assumptions

1. The world economy is morphing toward a global knowledge economy.
2. A global knowledge economy is part of a highly interconnected world.
3. Universities are producers of human capital and of complex ideas and innovation, and play an increasingly important role in creating, distributing and exploiting knowledge leading to further wealth creation and economic growth.

Mechanisms

1. Codifying, measuring and representing the scale, status and spatial organisation of the 'knowledge outputs' of a university (via ranking) enables an institution/nation/region to make visible, and *see,* their 'position' in, and 'progress'

toward, the realisation of a competitive global knowledge-based economy.
2. Specialised tools are developed and used for the management of knowledge and dissemination of knowledge-based products globally as institutions are asked to account for their knowledge outputs (publishing quality, impact of research, partnerships and collaborations with industry, and so on).
3. Knowledge-based products and services are made available, or sold, to other interested parties globally so as to generate greater competition, efficiencies and excellence, in turn offering new opportunities for value creation from knowledge services.

Codified and Tacit Knowledge

One key thinker is Michael Polanyi (see his book on *The Tacit Dimension*). Polanyi distinguishes between *codified* and *tacit* knowledge.

Codified knowledge is the form of knowledge we write down, in manuals, experimental procedures, textbooks and so on. This form of knowledge can be routinised and widely shared. It is static, and does not change as the world alters. Being widely available, but not dynamic, this limits any party's competitive edge, as others can also—assuming they can afford to—access the same texts, technologies, and so on.

Tacit knowledge is different. It is dynamic, changing as learning takes place. But there's a problem: tacit knowledge is difficult to transfer to another person, as it is particularly difficult to write down or verbalise (try describing even a simple task like how to tie a shoe-lace!).

We tend to acquire this knowledge through observation and interaction in social settings and in networks. For firms, accessing tacit knowledge is important for staying at the edge of innovation and change. This partially explains why science communities try to build working relationships across labs located in regional and global spaces, as we saw in our initial virtual mapping of scientific collaborations. By being engaged with others who are at the forefront of scientific knowledge production, or whose specific expertises (in method, equipment, or theoretical understanding) can be engaged with, enables new and significant breakthroughs in the sciences and social sciences,

Yoon Chemistry Lab, UW-Madison

Su-Chun Zhang research lab, UW-Madison

and thus leads to societally beneficial innovations.

From Mode 1 to Mode 2 Knowledge

Others, like Michael Gibbons *et al* in *The New Production of Knowledge* (1994) have argued scientific knowledge production and its use in industry and society is changing. Their book has been influential in shaping OECD thinking. In a nutshell, they argue that we are moving from Mode 1 to Mode 2 knowledge (see Table 1). Mode 1 Knowledge describes the norms and practices that legitimate knowledge for knowledge's sake. Mode 2 Knowledge describes the norms and practices that legitimate the production of useful knowledge to solve social problems. In other words, the pursuit of truth is being replaced by the pursuit of solutions to practical problems.

Table 1: Mode 1 vs Mode 2 Knowledges

Mode 1 Knowledge	Mode 2 Knowledge
Problems set & solved in contexts governed by academic interests	Problems set and solved in contexts of application
Discipline-based	Inter-disciplinarity
Homogeneity	Heterogeneity
Hierarchical, tending to hold its preserved form	Heterarchical and transient
Individual interest-driven and produced	More socially accountable and reflexive

You can immediately see Mode 2 Knowledge being appealing to policymakers charged with encouraging the university to contribute to economic development and growth.

Route 128 versus Silicon Valley Approaches to Knowledge and Innovation

A fascinating read on what knowledge production and circulation practices work best for innovation and economic development is the work of AnnaLee Saxenian of the University of California, Berkeley. While doing empirical work on regional innovation in the United States, Saxenian was struck by the different knowledge production and innovation models in Boston and Silicon Valley. As she notes in her book *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* (1995), during the 1970s, both California's Silicon Valley and Boston's Route 128 attracted international acclaim as the leading centres of innovation in electronics. However, in the 1980s, the two regions began to diverge following the economic crisis. By the end of the 1980s, Silicon Valley had become a spectacular success and Route

128 had faltered.

What was the cause of the success of one and the relative failure of the other? Saxenian argues that the Silicon Valley firms promoted collective learning and flexible adjustment amongst specialist producers all working on aspects of new technologies. And whilst companies competed, they were encouraged to learn from each other through collaborative communication, informal teams, and a more porous boundary between the firm and others in the innovation and supply system.

Route 128 firms tended to be hierarchical, centralised, more inward looking, and internally integrated, with information flowing vertically inside the firm, rather then from the firm to the suppliers. These were two different knowledge-production cultures, one more flexible, open, transient and oriented to diverse learning, and the other more rigid, hierarchical and limited in opportunities for learning.

These are just brief thumbnail sketches. But they are places to start for a more detailed understanding of why multi-level collaborations are regarded as important in systems of knowledge production and innovation. These ideas get folded into competitiveness policies and strategies more generally, and are realised in the everyday life of the university. When researchers are encouraged to develop closer links with industry, or to establish knowledge-transfer partnerships, they are being shaped by this kind of thinking.

Global Competition

A DEADLY SERIOUS RACE TO THE TOP

Now, you may well be thinking, especially given our account so far, that collaboration is the new normal for universities, research, and economic development. Only partly true! Coupled with collaboration is *competition*, in a deadly serious game.

The Race to the Top

A good example of this is a report released in the UK in 2007, known as the Sainsbury Report. For a start, its title *The Race to the Top* signals this is not just about a race, but it is about winning. And the only direction to go is up the value-added chain, NOT down. The report observes: “we should measure our performance by how fast we move into knowledge intensive goods and services and out of low-value-added ones” (p. 3).

What are *knowledge intensive goods and services*? The answer: “industrial research; publicly-funded basic research; user-driven research; knowledge transfer; institutions governing intellectual property and standards; the supply of venture capital; education and training of scientists and engineers; innovation policies of government departments; science and innovation policies of regional development agencies; and international scientific and technological collaboration” (p. 4).

Rising above the Gathering Storm

Similarly, a 2005 US Report commissioned by the National Academies (composed of the National Academy of Science, National Academy of Engineering, and Institute of Medicine), *Rising Above the Gathering Storm*, has the same sense of urgency about it. It calls for ten top actions that "federal policymakers could take to enhance the science and technology enterprise so that the United States can successfully compete, prosper and be secure in the global community in the 21st Century." BUT the authors of this report, as highlighted in a follow-up report, noted there was:

> …widespread unease about long term trends in US investments in research, development and higher education, and special and deepening concern about the competitiveness of US businesses and the state of primary and secondary education attained by vast numbers of our children. (pp. ix-x)

By comparison, Asia and Europe—seen as competitors in the global competition—have been investing in education, knowledge, innovation, investment and industrial infra-structures much more aggressively that the US. What is implied here is that the US risks its future unless it is able to resolve these problems.

The Race to the Top, US Style

A great deal of finger pointing in the US has followed that 2005 report. In 2006, the controversial Spelling's Commission report, *A Test of Leadership: Charting the Future of US Higher Education*, argued that the US had taken its eyes off the ball and become complacent:

> We may still have more than our share of the world's best universities. But a lot of other countries have followed our lead, and *they are now educating more of their citizens to more advanced levels than we are*. Worse, they are passing us by at a time when education is more important to our collective prosperity than ever. (p. vii; our emphasis)

The Spelling's Commission identifies low levels of literacy, lack of thinking skills, scant information about and access to higher education, and high attendance of two-year community colleges (40% of the 14 million undergraduate students in the US) as fundamental issues that need to be addressed.

Since 2005, there have been major initiatives in the United States aimed at increasing levels of performance of learners and teachers. In its own Race to the Top Program, launched in 2009 by the Obama administration, the American Recovery and Reinvestment Act (ARRA) provided $4.35 billion for the *Race to the Top Fund* to fund initiatives in four areas:

- Adopting standards and assessments that prepare students to succeed in college and the workplace and to compete in the global economy;
- Building data systems that measure student growth and success and inform teachers and principals about how they can improve instruction;
- Recruiting, developing, rewarding and retaining effective teachers and principals, especially where they are needed most; and
- Turning around our lowest achieving schools.

Growing Anxieties - The Slippery Slope

A sense of impending crisis is again flagged in the National Academies' 2010 *Rising Above the Gathering Storm, Revisited*. "The effort to "jump-start" America's competitiveness finds itself standing at a precipice with regard to continued funding at an adequate level" (p. 3). And on p. 4 it noted: "The Gathering Storm committee concluded that a primary driver of the future economy and concomitant creation of jobs in the 21st Century will be innovation, largely driven from advances in science and engineering". "**Where does America stand relative to its position of 5 years ago when the Gathering Storm report was prepared?**" the Report also asks. "**The unanimous view of the committee members participating in the preparation of this report is that our nation's outlook has not improved but rather worsened**" (p. 5; bold in the original). To make the case that the situation had not improved two kinds of 'facts' are presented to the reader.

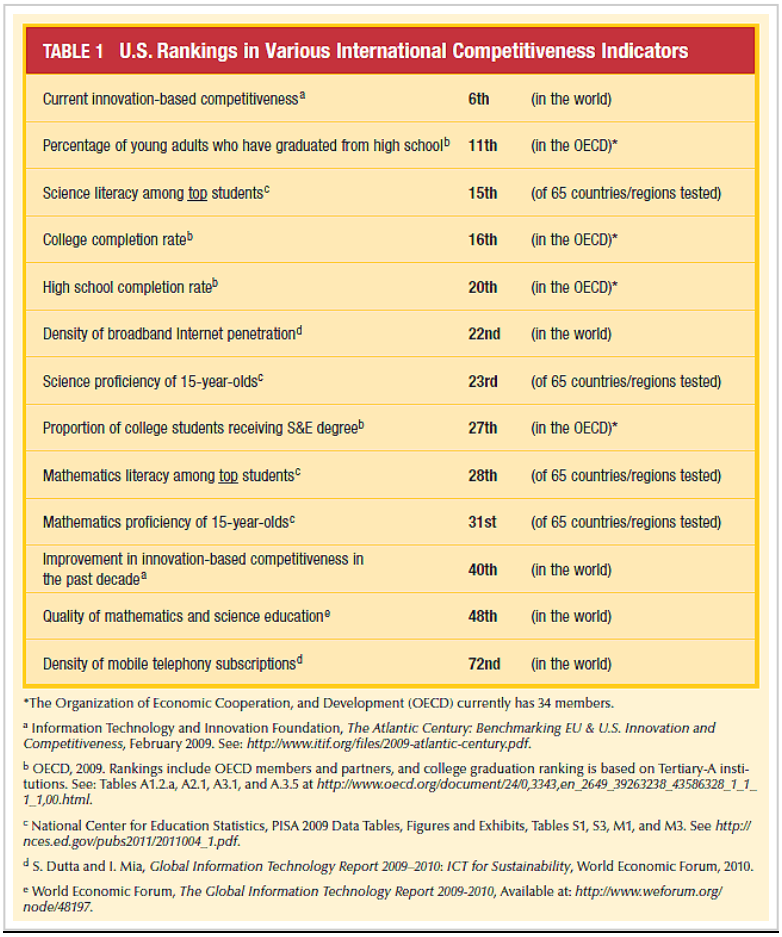


TABLE 1 U.S. Rankings in Various International Competitiveness Indicators

Current innovation-based competitiveness[a]	6th	(in the world)
Percentage of young adults who have graduated from high school[b]	11th	(in the OECD)*
Science literacy among top students[c]	15th	(of 65 countries/regions tested)
College completion rate[b]	16th	(in the OECD)*
High school completion rate[b]	20th	(in the OECD)*
Density of broadband Internet penetration[d]	22nd	(in the world)
Science proficiency of 15-year-olds[c]	23rd	(of 65 countries/regions tested)
Proportion of college students receiving S&E degree[b]	27th	(in the OECD)*
Mathematics literacy among top students[c]	28th	(of 65 countries/regions tested)
Mathematics proficiency of 15-year-olds[c]	31st	(of 65 countries/regions tested)
Improvement in innovation-based competitiveness in the past decade[a]	40th	(in the world)
Quality of mathematics and science education[e]	48th	(in the world)
Density of mobile telephony subscriptions[d]	72nd	(in the world)

*The Organization of Economic Cooperation, and Development (OECD) currently has 34 members.

[a] Information Technology and Innovation Foundation, *The Atlantic Century: Benchmarking EU & U.S. Innovation and Competitiveness*, February 2009. See: *http://www.itif.org/files/2009-atlantic-century.pdf*.

[b] OECD, 2009. Rankings include OECD members and partners, and college graduation ranking is based on Tertiary-A institutions. See: Tables A1.2.a, A2.1, A3.1, and A.3.5 at *http://www.oecd.org/document/24/0,3343,en_2649_39263238_43586328_1_1_1_1,00.html*.

[c] National Center for Education Statistics, PISA 2009 Data Tables, Figures and Exhibits, Tables S1, S3, M1, and M3. See *http://nces.ed.gov/pubs2011/2011004_1.pdf*.

[d] S. Dutta and I. Mia, *Global Information Technology Report 2009–2010: ICT for Sustainability*, World Economic Forum, 2010.

[e] World Economic Forum, *The Global Information Technology Report 2009-2010*, Available at: *http://www.weforum.org/node/48197*.

Table 2: US Rankings in Various International Competitiveness Indicators
Source: *Rising Above the Gathering Storm Revisited - Executive Summary*, National Academies of Sciences, 2010, p. 6

The first 'fact' is the current position of the US on a series of international competitiveness indicators (see Table 2). A number of these indicators are drawn from the OECD's PISA assessment, flagged earlier above, of 15-year-olds and from its *Education at a Glance* statistics. Competing in the global economy means also competing in the global assessments of student performance.

A second 'fact' is the changing population in the US. A key issue pointed to is the low level of participation by minority students (African-Americans and Hispanics) in science and engineering, and yet they are the fastest growing percentage of the population (currently 30% of the total US population). Unless enrolments of African-Americans and Hispanics go up, then it is argued that the numbers of scientists and engineers and will also decline. Now you may be wondering whether or not we actually need *more* rather than *less* engineers, especially as a good part of the economy for countries like the US is now in areas like the creative sector, financial services, and so on. What seems to us to be clear is that a techno-science account of the knowledge economy dominates in these kinds of reports – with a strong tendency to produce a very particular set of solutions for future economic development.

The New Tiger on the Block: The Rise of China

By 2014, the messages from the US's National Science Foundation were sounding even more alarmed. In their *Science and Engineering Indictors 2014* report, the headline news was that the US's dominance in Knowledge and Technology Intensive (KTI) industries (high technology manufacturing such as aircraft and spacecraft, pharmaceuticals, and knowledge-intensive services such as commercial business, financial and communications services) was being challenged by the rise of China. In recent years:

> [R]egional and national shares of worldwide KTI production has been shifting. Between 2003 and 2013, China's HT manufacturing rose more than five-fold, resulting in its global share climbing from 8% to 24% in 2012. (p. 3)

The report then links declining investments in R&D in the United States, on one hand, and increasing investments in R&D in China (p. 5), on the other (see Figure 1).

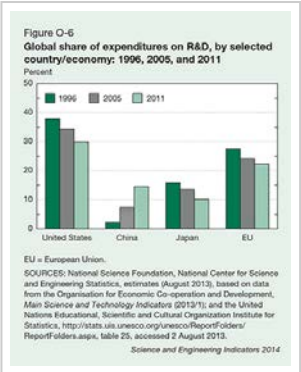


Figure 1: Global share of expenditures on R&D
Source: Science and Engineering Indicators 2014, National Science Board

Figure 2: Global R&D expenditures by Region
Source: Science and Engineering Indicators, 2014, National Science Board

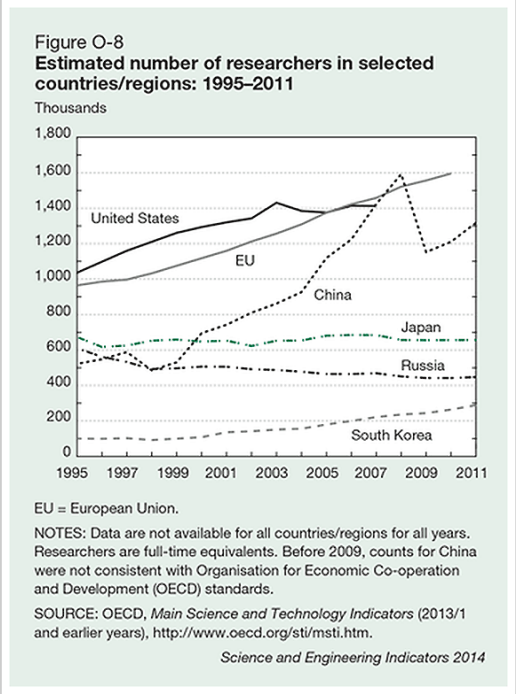


Figure 3: Estimated Number of Researchers in Selected Countries/Regions 1995-2-11
Source: Science and Engineering Indicators, 2014, National Science Board

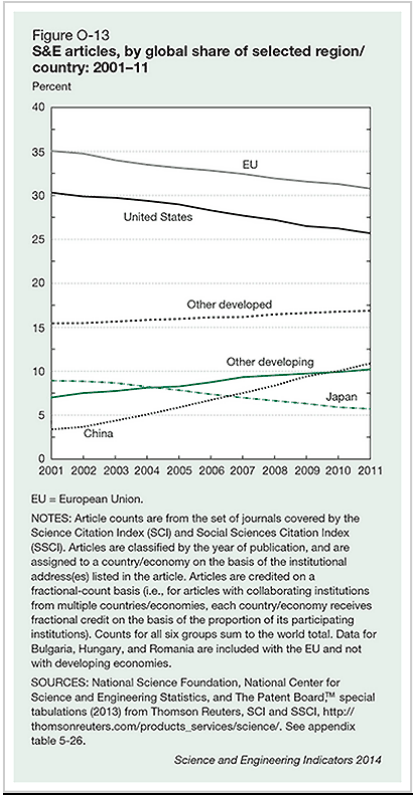


Figure 4: S&E articles, by global share of selected region/country: 2001-11
Source: Science and Engineering Indicators, 2014, National Science Board

Viewed regionally, the East and Southeast Asian region falls just short (by less than 1%) of North America in terms of expenditure on R&D (p. 6). The estimated number of researchers for

countries and regions is compared. The US shows a declining trajectory, compared to the EU and China (p. 7) (see Figure 2 Global R&D by Region).

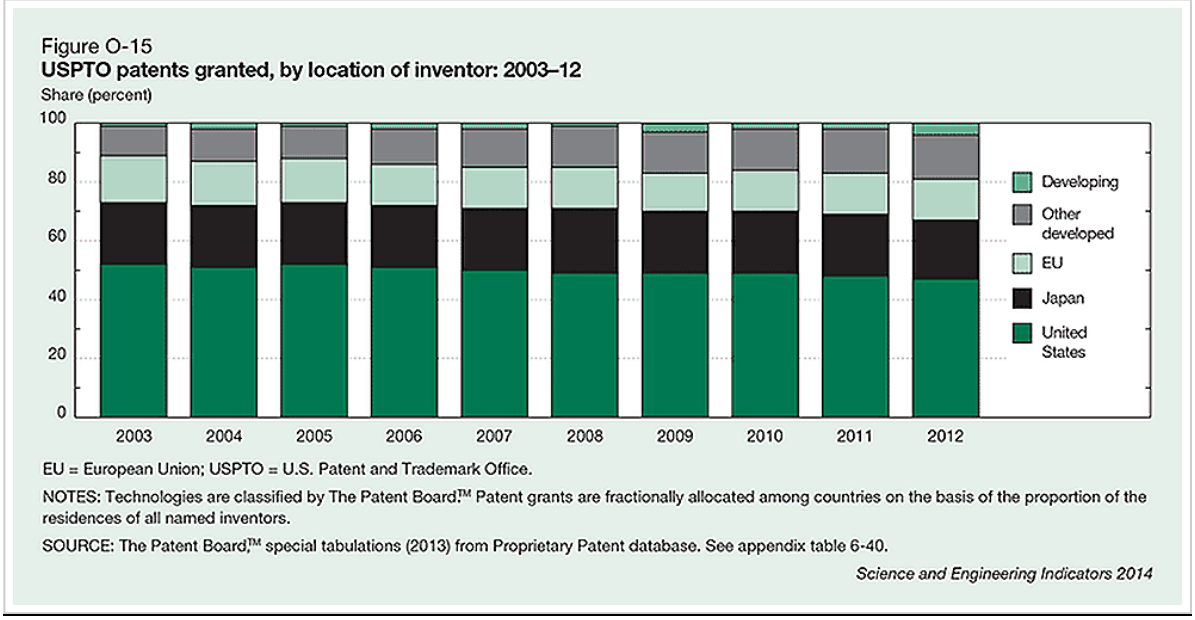


Figure 5: USPTO Patents Granted by Location of Inventor
Source: Science and Engineering Indicators, 2014, National Science Board

A similar story is told around patents granted by location of inventor (p. 11). Add them all up: the density of internet connections, the total number of science and engineering researchers, science and technology articles, the patents granted to inventors, and so on, and we have a very techno-science account of what our future should look like.

However, in the USA, in the wake of the 2008 financial crisis, there are major questions emerging around how research in universities is to be funded, and by whom.

Shortfalls in Research Funding and the Growing Role of Corporate Philanthropy

In a recent *New York Times* article, journalist William Broad noted that American science, long a source of national power and pride, is increasingly a private enterprise. As he said, "…in Washington, budget cuts have left the research complex reeling. Labs are closing. Scientists are being laid off. Projects are being put on the shelf, especially in the free-wheeling realm of basic research".

The consequence is that corporate donors are moving in with their own priorities, time-scales and interests. And as policy analyst from the American Association for the Advancement of Science noted, "the practice of science in the 21st Century is becoming shaped less by national priorities or by peer review groups and more by the particular preferences of individuals with huge amounts of money".

It is not too difficult to construct a list of concerns raised by the privatization of research, and we're sure you can think of some as well. The obvious one is that science projects that require investments over a longer time frame are likely to be neglected as venture philanthropists (an

oxymoron?) want to see the results of their investment in quick and tangible ways. Interest may flow to areas of science that have implications for the businesses of the rich. In short, the privatization of research gives those who are very wealthy more influence on science than is good for either the society or the economy.

Global Framers & Agendas

So far we've been exploring the work of key thinkers whose work has shaped national development strategies. But there are also a range of global actors who have become particularly powerful in conversations about how to build globally competitive knowledge economies and the need for a changed role for the university in this. These actors include international, multilateral, and regional organisations, such as the Organisation of Economic Cooperation and Development (OECD), the World Bank, the International Finance Corporation, the World Economic Forum, the World Trade Organization, United Nations Educational and Scientific Committee (UNESCO), and the European Commission; industry bodies such as the International Association of Universities Association (IAU); global education unions like Education International (EI); education consultancy firms including Pearson Education and McKinsey & Company; globally-influential think-tanks, such as the Brookings Institution; academic entrepreneurs like Clayton Christiansen and Richard Florida; media giants such as the Times Higher Education and the Economist's Intelligence Unit; financial institutions such as Deutsche Bank and Santander; academic publishing houses, including Informa, Elsevier, and the Nature Publishing Group; and a raft of transnational for-profit higher education providers that include firms like Kaplan and Laureate Education. They are often visible in industry fairs and events, such as NAFSA, EAIE, and the Going Global conferences.

Though not always interested in the same kind of issues, these global players have increased their capacity to shape the agendas of the higher education and research sector. They bring in new monies, new logics, new temporal rhythms, and new networks. And just as important, they often frame development debates at a range of relatively large scales or levels, as well as with respect to a myriad of temporalities beyond the traditional academic ones.

We've undertaken a preliminary mapping of these players—many of them from outside the formal capital HE higher education sector, initially at least—and their logics and points of entry, largely because this more globally-influential set of actors tend not to be on the radar of many of us. This matters! A lot! If we are not aware of why, how, and where global players are shaping agendas, we are not able to weigh in on these debates ourselves.

Examples of Emerging and/or Increasing Powerful Actors in Global Higher Ed & Research

ACTORS	GOALS/LOGICS MECHANISMS	TEMPORAL HORIZON
International organizations (e.g., EU, IFC, OECD, UNESCO, WTO, WIPO)	Development and system change	1-5-10 years

Private information system firms (e.g., Thomson Reuters, QS, Economist Intelligence Unit)	Research services & insights (e.g., citation indices) for profit. Databases; bibliometrics	Quarterly/yearly with strategic plan
Private tech firms (e.g., Google, Cisco)	Enhancing access to information for profit	Quarterly/yearly with strategic plan
Private for profit education firms (e.g., Kaplan, Laureate)	Profit via service provision	Quarterly/yearly with strategic plan
MOOC platforms (e.g., Coursera, EdX)	Education (incl LLL), revenue, profit (for some), unruly innovation	Weekly/monthly/yearly
Private IP law firms	Profit via service provision	Client-driven
Private financial services firms (e.g., Moody's Standard and Poor's)	Profit via risk analysis	Client-driven
Private foundations (e.g., Gates Foundation)	Development via funding programs	1-5 years
University associations, consortia	Collaborative research, teaching, enhanced reputation (i.e. branding), best practice sharing.	1-3 years

ACTORS	GOALS/LOGICS MECHANISMS	TEMPORAL HORIZON
Regional Institutions (e.g., EU, ASEAN, APEC, ASEM)	Regional integration and development. Funding for programs and projects, alumni associations, benchmarking, etc.	1-5-10 years
Regional Associations of Universities and HE Institutions (e.g., EUA, Coimbria, Association of Universities Grupo Montevideo; Asia Pacific Association of International	Regional integration and development, policy-making capacity, lobbying capacity, enhanced mobility, best practices sharing.	1-3-5 years

Education)		
Regional Discipline- and Field-specific Associations and Accreditors	Quality assurance, regional identity formation and/or protection	1-3-5 years
Regional Accreditors and QA Agencies (e.g., EQAR)	Quality assurance, regional identity formation and/or protection	1-3-5 years
Regional Funding Councils (e.g., ERC, ESF)	Regional integration and development, capacity building, mobility, preventing brain drain, global challenges, Global research infrastructure Joint calls for proposals, joint review procedures	1-3-5 years

ACTORS	GOALS/LOGICS MECHANISMS	TEMPORAL HORIZON
Ministries of Trade, Foreign Affairs, Development Aid	Enhancing trade in services, soft power, economic development	1-5 years
Ministries of Education, Research	Restructuring HE and research sphere, improving quality, enhancing mobility, soft power. Programs, projects (e.g., regional universities)	1-5 years
Private media firms (e.g., Times Higher Education, USA Today)	Ranking to enhance profit and stature via bibliometrics.	Annual
University presidents/rectors	Best practices and global reputation. Events, declarations	Irregular
National and regional funding councils	Global research infrastructure Joint calls for proposals, joint review procedures	Irregular
Monarchies and authoritarian governments (e.g., Qatar, Saudi Arabia, UAE, China, Singapore)	Capacity building and branding	Irregular, though strategic re.

		structural change in economy

Are there major players we have missed? Who are they? What are they doing in your part of the world? What are their logics and points of entry? Where might we place the MOOC providers and their platforms? What does their presence do to the sector – both in terms of where and how decisions get made and about what?

Case Study: The OECD – A Global Competition Maestro?

The Organisation of Economic Cooperation and Development (OECD) plays a very significant role as a global player shaping higher education agendas around building competitive economies. It does this in a number of ways, through scenarios on what different futures might look like and how to get there, expert reports on trends and issues, conferences and seminars, country reviews, and global indicators and scorecards.

Who is the OECD, you ask?

A typical reply is that it is "the rich country's club" with its headquarters in Paris. Its members account for something like 3/5ths of world Gross National Income (see this Wikipedia entry for a quick review of the OECD). And this is true. But this does not mean its agenda-setting activity is confined to these countries. In more recent years the OECD has been very influential through its Development Assistance Committee (better known as DAC) in shaping what goes on in low-income countries.

Take a listen now, to two key OECD officials, with a wealth of knowledge about the nature of the OECD, and the OECD's role in shaping debates about higher education, science and technology, and innovation systems. Recall, too, that both Dirk Van Damme and Richard Yelland spoke to you in Week 1 regarding the global competency topic.

Richard Yelland is Head of the Policy Advice and Implementation Division (PAI) in the Directorate for Education and Skills at the OECD. Richard joined OECD in 1986 from the then Department of Education and Science in the United Kingdom. He is frequently invited to speak at international meetings on education. He was born and educated in England, and has a degree from the University of Cambridge.

Dirk Van Damme is Head of the Innovation and Measuring Progress Division (IMEP), which covers both the Centre for Educational Research and Innovation (CERI) and the Indicators of Educational Systems (INES) programme, in the OECD Directorate for Education and Skills. His interests are evidence-based innovation in education, comparative analyses of educational systems, new developments in the learning sciences

mp3 | transcript

and knowledge management in education.

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The OECD's core mission has remained much the same over the years, centred on economic development. It was established in 1948 to help with post-war reconstruction in Europe. But it was not until the end of the 1980s that we can see the OECD becoming the kind of influential body we see today.

The rise of the Indicators and Analysis Division, Directorate for Education is a case in point. It is headed up by Andreas Schleicher, who has been instrumental in driving the development of a range of tools that measure the performance of education systems around the world. The significantly increased influence of the OECD led Richard Woodward, in a primer on the OECD, to remark that if the global governance world had an Oscar ceremony, the OECD wouldn't win any awards for Best Actor or Best Director. But, Woodward argues, this judgement would conceal the OECD's real power and influence. The OECD plays a major role in designing and orchestrating the stage on which more visible governance superstars strut.

One of the ways the OECD has done this is by shaping what comes to count as a knowledge-based economy, and then using this framing to let countries see where they stand in relation to other countries.

This framing has taken time, with work beginning in the 1970s when the OECD was well aware of the challenges ahead in building an economic development model to underpin a new long wave of accumulation. Their first efforts were influenced by popular writers such as Daniel Bell and his thesis of a knowledge-based economy being at the heart of a new post-industrial world.

Benoit Godin argues that the first step toward the idea of 'the knowledge economy' in the OECD came in 1996, with a document written by the Canadian delegation to an OECD meeting. The paper discussed the potential of 'new growth theory' for underpinning the development of a knowledge economy. New growth theory identified the knowledge base of a population, and its distribution across the population, as important. Work began on indicators that would measure innovation, research and the quality of learning. By 1999, 32 indicators were reported. By 2005 the OECD's KBE concept had become conceptually refined around the nature of its economic regime, a well-educated population, its innovation system, and new technologies.

The OECD now maintains a huge base of indicators (some 260 or more!) that characterize a knowledge-based economy, and routinely publishes representations of a country's performance. The *Science, Technology and Industry Scoreboard* is published every two years, aimed at policymakers and industry analysts. It is also able to draw upon this base of indicators to develop industry-specific reports, for instance in relation to higher education. Take a look at how the OECD views higher education, and how education contributes to the construction of knowledge-based economies more generally (see List

List of topics to be considered in 'building knowledge' for economic development

1. Investment in knowledge
2. Human resources and knowledge-based capital

of Topics to be Considered in Building Knowledge for Economic Development above). Note that advanced degree holders (doctorates) are particularly important.

In the side notes to this section of the Scorecard, the OECD (2013, p. 86) states:

> Education and research, along with innovation, are at the heart of knowledge economies and drive long-term growth. Investments in higher education (HE), R&D and new information and communication technologies (ICT) complement each other, empower human capital and provide the infrastructure needed to address the many challenges that societies face.

These framings and phases are repeated in all policy documents that in turn draw upon the OECD as an authority.

3. Learning for innovation
4. Skills for innovation
5. New doctorates
6. Doctorate holders
7. Researchers
8. R&D
9. Higher education and basic research
10. Business R&D
11. R&D tax incentives
12. International funding of R&D

Source: *Science, Technology and Industry Scoreboard 2013, Paris: OECD, p. 85*.

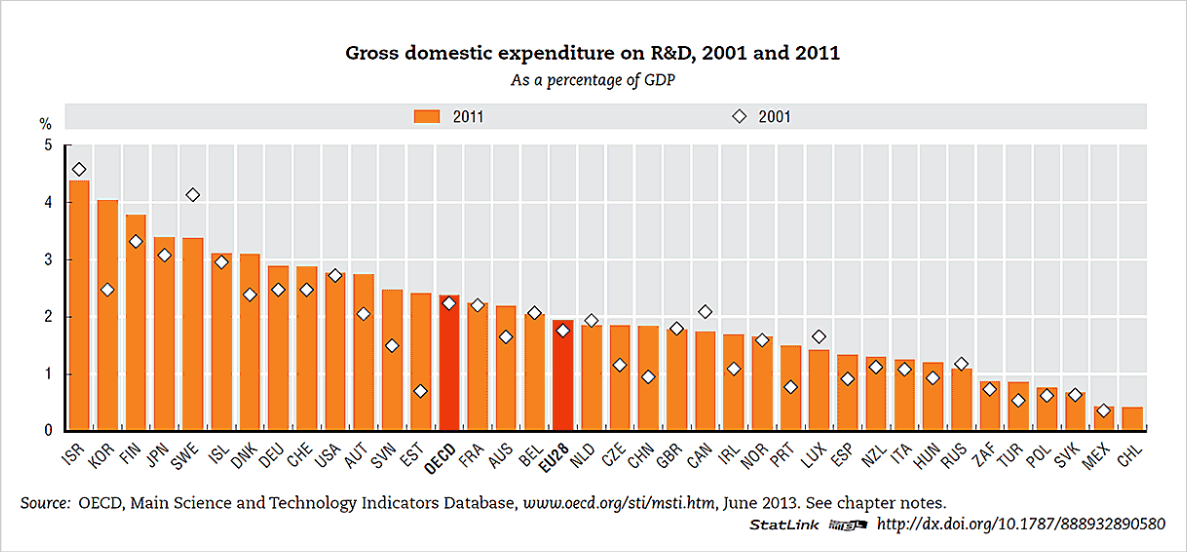

Figure 6: Gross Domestic Expenditure on R&D, 2001-2011
Source: *Science, Technology and Industry Scoreboard*

2013, Paris: OECD, p. 87.

Now look at Figure 6 and how it represents gross expenditure on R&D, some of which is undertaken in universities and some in industry:

From 2001 to 2011, the R&D intensity of the OECD area increased slightly from 2.2% to 2.4% of GDP. This aggregate reflects a highly heterogeneous performance in the years before and after the economic and financial crisis of 2008. Economies as Korea, Portugal and Slovenia

experienced an increase in R&D intensity comparable to China's, but R&D intensity declined in Sweden and Canada. (p.86)

Now, there is little doubt that Canadian and Swedish policymakers will be thinking through the implications of this finding and what it means for their global competitiveness.

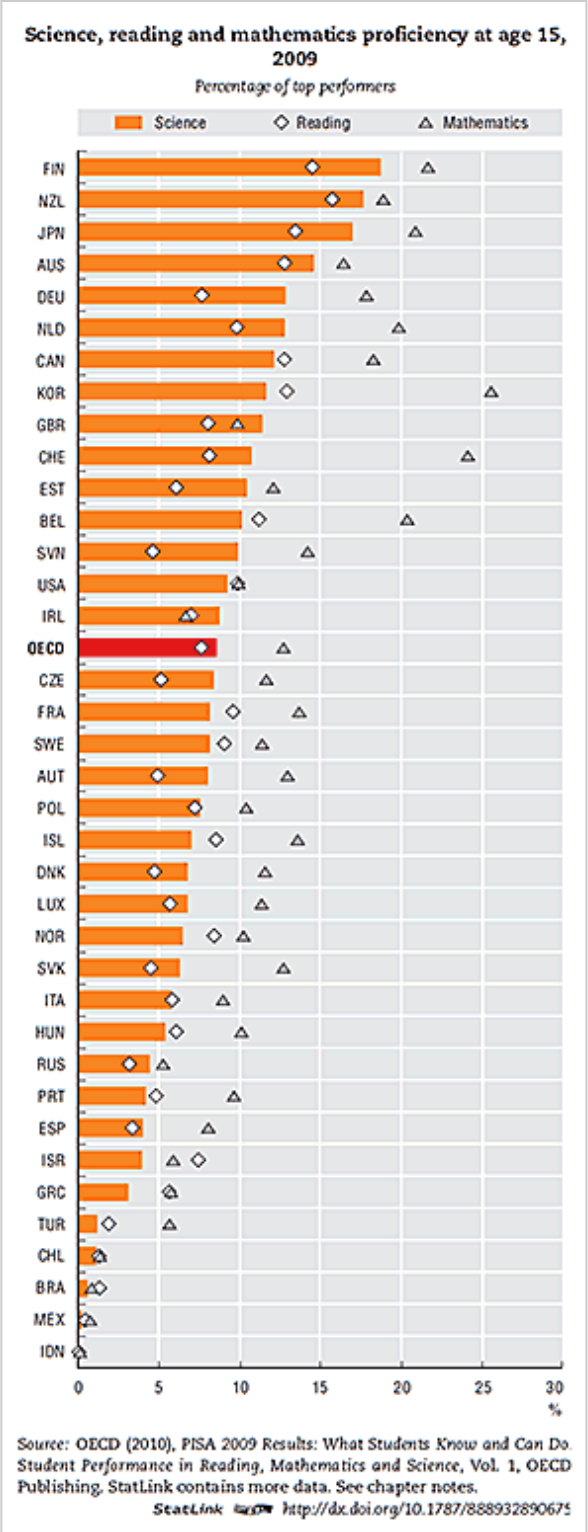

Figure 7: Science, Reading and Mathematics

Again, in the notes beside the figure, in ranking levels of performance on science, reading and mathematics on the PISA tests, we can see the assumptions at work. The *Science, Technology and Industry Scoreboard 2013* states:

The rapidly growing demand for highly skilled workers has led to global competition for talent. High-level skills are critical for creating new knowledge, technologies and innovation and, as such, are key to economic growth and social development, and top-performing students in reading, mathematics and science are likely to contribute to a country's future talent pool. Results from the OECD's 2009 PISA study show that in the OECD area, 8.5% of students were top performers in science, 7.6% in mathematics and 12.7% in reading.

Proficiency at Age 15 (2009)
Source: *Science, Technology and Industry Scoreboard 2013,* Paris: OECD, p. 90.

> Economies with better performance in mathematics and science often also invest more in R&D (p. 90).

In short, innovation in a knowledge economy will come from science and mathematics.

Our purpose in developing an extended account of the history of these indicators and their current use to guide policy and practice is to make the point that these are the outcomes of decisions taken over time as to what might count as a knowledge economy. Early on, there were different views on what to call it: a learning economy, an information economy, and so on. By the late 1990s, not only had the OECD stabilised this idea, but it became more widely used. By early 2000, countries around the world were confidently calling their economic development strategy a global knowledge economy strategy.

Needless to say, higher education institutions have a critically important role in this development process for they are critical parts of the institutional infrastructure that supports city-regional and national innovation systems, not to mention broader regional development processes. See, for example, the Amsterdam-focused section in Week 2, and these specific readings:

- OECD (2007) *OECD Territorial Reviews: Randstad Holland, Netherlands*, Paris: OECD.
- Dubarle, P., Holm-Nielsen, L, Olds, K., Timmerhuis, V., Yelland R. (2010) *OECD/IMHE Reviews of Higher Education in Regional and City Development: Amsterdam*, Paris: OECD, 92 pp.
- Redden, E. (2013) 'Liberal arts go Dutch,' *Inside Higher Ed*, 8 February.
- Van Rees, J. (2013) 'On Amsterdam's plans to establish a third university,' *Inside Higher Ed*, 26 April.

In this case you see a broader territorial review, leading to a more focused examination on the current and potential role of higher education institutions in city-regional development, and then a more focused look at specific institutions.

Vrije Universiteit Amsterdam

But tussling with what to call this new kind of economy is not all that matters. The OECD will always be confronted with limited financial resources to advance its projects, as funds come from the member countries who must buy into the idea. An indicator system that shapes

national education sectors must be taken up and used by these actors in terms of strategising policy and practice; we can see considerable evidence of this in the case of the US.

The Paradoxes and Contradictions Abound

There are major paradoxes and contradictions at work in this global project. To begin, in fixing the terms of the race to the top around a very narrow set of accountability and standards measures, this could result in turning off students from engaging in science (broadly defined), just when the higher education sector is urgently wanting to recruit more students into its departments.

Relatedly, there is also a narrowing of STEM into techno-science, and a narrow conception of that at best. Surely even in its own terms, this places limits on levels of creativity and forms of innovation, just when the pressure is for developments in the opposite direction. Some are even asking what does STEM have to do with an emerging creative industries/services sector economy? Perhaps, they argue, the big science and engineering academies are simply part of the old (still powerful) industrial economy. We'll leave you to think your way through that particular minefield.

There are also other dissenting views, largely focused on what all this means for the university as we knew it. *What are Universities For?*, asks Cambridge Professor Stefan Collini. And his is just one voice amongst a number of leading academics who have begun to argue we urgently need to have a wider discussion on the plurality of knowledges needed to solve the problems in our world.

This is a point, if you recall, that Harvard's president (Drew Faust) made and that we referred you to in Week 1. In trying to manage one storm—our place in the competitive knowledge economy—are we not creating another storm as a result? That storm is the consequence of taking our eye off the need to draw upon the knowledge reservoir of the world in order to solve pressing global issues and concerns such as climate change, sustainability, world security and so on. By prioritising some knowledges over others, as we have seen with this very narrow techno-science account of a knowledge economy, we may also be limiting the conditions of our own and our sector's flourishing.

Harvard philosopher Martha Nussbaum, in her book *Not for Profit: Why Democracy Needs the Humanities*, shares this concern. She argues that more than ever we need the humanities to enable us to understand each other and our common challenges and futures. Rather than a laser-like focus on science and technology, it is the humanities, Nussbaum argues, that allow us to work together instead of exploiting each others' vulnerabilities, to move beyond only thinking about competition that so many of the framers we noted above are working so hard to foster.

Martha Nussbaum: not for profit from ISVW on Vimeo.

This is an issue Nigel Thrift, Vice-Chancellor and President, University of Warwick, attends to in our second Q&A session. Take a close listen to what he has to say about the big and sprawling (we admit!) issues and processes we focused on in this week's class, and then how universities might be able to navigate through this complex context.

mp3 | transcript

This is an issue, as you will discover next week, that Eva Egron Polak (Secretary General, International Association of Universities) also grapples with. In her podcast she will argue that unless we are prepared to have these more challenging debates, and to act on our convictions in ways that change things, then the sector itself risks losing its way.

These are challenging times for universities and those who lead them through the sometimes choppy waters that come with the gathering storms. What is a university for in a globalizing world? How might we take advantage of globalization and create the kinds of institutions, footprints, knowledges, and learning experiences, that make the most of creativity, flexibility, mobility, and emerging technologies? And can we do so in ways that open up knowledge to *knowledges*, value to *values*, and economy to *economies*? Now that's a conversation that we could, or should (?), take viral.

Susan and Kris

Week 5 Activity

There are three main discussion exercise options this week. The first two are focused topic discussions, while the third is an open-

ended forum for discussing and debating any topic related to Week 5.

Choose from one or more of the following options:

Option A: 'Knowledge Economy' as Ideology?

All of this 'knowledge economy' talk is pure ideology! Argue for or against this statement.

Go here to post your **Option A** contribution

Option B: Global Framers and Comparisons

Comparing, and being compared, is a long-standing practice that most of us, as individuals, have experience with. However, we are seeing comparisons (of national economies, higher education systems, national research output, learning outcomes, international collaborative authorship, etc.) emerge and become publicized on an increasing basis. What are some of the benefits and costs of comparing remarkably different geographies? Is it possible for lessons to be learnt about other systems without losing something about your own system? And if comparisons generate effects, are we likely to see more convergence, and if so, is this a good thing?

Go here to post your **Option B** contribution

Option C: Open Debate/General Discussion

Generate a discussion and debate about any aspect of this week's content. Your task is to develop an insightful argument and/or develop an informed reaction to someone else's posting.

Go here to post your **Option C** contribution

How to submit your contribution:

1. Submit your response as a new posting in the corresponding discussion sub-forum (linked above) by 10:00 a.m. (CST) on Monday, 5 May.
2. Read and debate with your fellow students. You are encouraged to discuss in all three topic areas.

3. Vote-up the posting(s) that you feel provide(s) the most insightful contributions.
4. **For those seeking a Statement of Accomplishment, please click the button below to attest your completion**

   Tip: Copy the URL of your thread before submitting your activity completion record.

Click to Attest Completion

Sharing Policy Reminder:

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