5 Octavia, the Spider-Web City

Jürgen Enders, Frans Kaiser, Henno Theisens and Hans Vossensteyn

Now I will tell how Octavia, the spider-web city, is made. There is a precipice between two steep mountains: the city is over the void, bound to the two crests with ropes and chains and catwalks. You walk on the little wooden ties, careful not to set your foot in the open spaces, or you clinging to the hempen strands. Below there is nothing for hundreds and hundreds of feet: a few clouds glide past; farther down you can glimpse the chasm's bed. This is the foundation of the city: a net which serves as passage and as support. All the rest, instead of rising up, is hung below: rope ladders, hammocks, houses made like sacks, clothes hangers, terraces like gondolas, skins of water, gas jets, spits, baskets on strings, dumb-waiters, showers, trapezes and rings for children's games, cable cars, chandeliers, pots with trailing plants. Suspended over the abyss, the life of Octavia's inhabitants is less uncertain than in other cities. They know the net will last only so long.

Italo Calvino: The Invisible Cities (1972)

In 2020, the idea of the University (with a capital U) as a single concept has diminished in the face of multiple missions and visions of higher education and research that have stimulated further institutional differentiation and diffusion. This unbinding of the university has strengthened the many tangible hands of networks that have become the main modes of coordination within universities as well as between institutions and other providers and consumers. True, the visible hand of the state and the invisible hand of the market have their role to play but ‘networking’ is now the name of the game. Today’s society is not characterised by the triumph of one rationality over others – whether it is the ‘market’ that has metaphorically diffused everywhere, the ‘welfare state’ that has lost control while gaining in interconnectedness, scientific rationality or socio-technological relevance that are increasingly interwoven with each other and with society. What typifies society is the blurring of the boundaries between previously functionally differentiated subsystems that now search for new forms of horizontal and vertical integration via the web.

Simply speaking, universities are as much driven by these co-evolutionary processes as they are drivers of them. These processes are themselves interwoven with the globalisation of the economy and the individualisation of the life course. It is this complex social dynamic that pushes universities to seek and create nodes that will link them with each other and with society in manifold ‘elasticities’.

---

1 The concept of ‘co-evolution’ precisely refers to a set of simultaneous developments where it is unclear which is the cause and which the effect, or if they are causally linked at all.
The European Policy Landscape

The EC (European Consortium) of 2020 consists of 37 member countries (including new members Belarus, Moldavia, Norway, Switzerland and Turkey) and 10 associate world-wide partners (including Argentina, Brazil, Egypt, Israel, Mozambique and South Africa). Political responsibility for higher education and research is integrated into the overall policy networks for socio-economic development and innovation, and spread over a multi-layered web of local, (inter-)regional and (multi-)national institutions. This integrated approach to open coordination helped enormously in overcoming traditional sectoral departmentalism and the fragmentation of education, research, science and technology policies. Numerous ways of involving experts and stakeholders in a more systematic and participatory manner added to the legitimacy of these policy networks. However, the sheer number and shifting composition of the various networks, task forces and working groups for Strategic Development and Innovation (SDI) and Socio-Technological Inventions (STI) make it difficult for the observer (and the actors involved) to identify where authority and responsibility are actually located.

The Skyline of the Knowledge Economy

On first sight, the skyline of the knowledge economy seems to be more simply structured than in earlier decades with the few big towers of global companies clearly dominant. These companies show little commitment to national or regional affairs in higher education and research. Closer to the ground the nodes and links between SMEs and the local and regional working units of global companies form the back-bone of knowledge-intensive production, service and consumption – and of the labour market for knowledge workers. The globalisation of knowledge formation and transfer and the individualisation of the life course (with shifting and multi-faceted group identities) have had a profound impact on labour markets and on forms of work. ‘Standard employment’ has eroded to such an extent that yesterday’s exception (part-time, temporary and self-employment; movement between sectors, employers, and types of work) is today’s rule. Network technologies such as the Internet under-pinned the construction of information and social webs across companies and countries. On this labour market for knowledge workers the ‘credentials’ of ‘graduates’ are just the first step in the validation of competencies in the workplace. What really counts (and

---

2 The end of the Pan-European approach came as a relief to many, especially to those critical of the inward-looking character of inter-European cooperation (establishing cooperation amongst neighbours to counteract pressure from other parts of the world).

3 Socio-technological inventions as used here are not matters of simple probabilities, rationally calculated by experts with the cold arithmetic of cost-benefit analysis. Rather they are woven into the very fabric of innovation within a world society that is inevitably ‘at risk’.

4 This concern is found mainly amongst political analysts. Most people are quite satisfied with the recent statement of the European Commissioner for Innovation (who is responsible for education and research): ‘We do not know exactly how it works, but it works’.
differentiates members of network elites from the mass of net-workers) is social capital, cognitive mobility, qualifications for network sustainability and symbolic production.  

The Institutional Landscape

In such conditions of hyper-complexity, successful universities capitalise on the traditional capacities of academic and scientific networks as well as on inter- and intra-organisational networks that are based on reciprocity, trust, and long-term commitment. ‘Small units, thick information and multiple webs’ is a popular slogan originally coined by the University of Trullala. This metropolitan comprehensive university has de-departmentalised its structures into a holding-like matrix that comprises public, semi-public and private entities for teaching, research and service. Some (jealous) observers call it ‘the spider in the web’. For example, its undergraduate teaching is integrated into the European Open University (EOU), a non-profit consortium of on-line providers from 12 countries spread all over Europe. EOU is affiliated with on-line providers on other continents with whom it shares on-campus facilities for international students. Trullala offers courseware and tutorials within the dual-mode approach of the EOU. This combines information and communication technology capacities with elements of face-to-face interaction between teachers and their (probably) more than 400,000 students. The three big science & technology research units of Trullala are affiliated with the Ford-Renault Institute of Technology, a private for-profit institution that works with different basic research units to promote knowledge and technology up-take. The Institute for Metropolitan Innovation at Trullala connects a shifting number of its faculty to regional business and other public and private stakeholders interested in socio-technological inventions.

Cooperation can also lead to new institutional forms within bigger but strongly differentiated organisations. Some universities have disappeared from the landscape altogether following mergers with other universities and/or private R&D organisations. The Technical University of the Netherlands and the Bio-Medical Alps University are two examples of the conglomeration of a number of once ‘stand-alone’ universities with the private laboratories of multi-national companies. In this construction companies were able to outsource their R&D function without loosening their ties to related innovation capacities. In contrast other universities have decided to organise themselves around more selected disciplinary or professional clusters. The Budapest School of Governance, the Springer-Lingua University and the Institute of Cognitive Science are among the more-well known examples for such multi-disciplinary specialisations in postgraduate training and research.

---

5 Symbolic knowledge workers manipulate words, numbers, images and sounds in order to broker and analyse information and to provide meaning to information so that it can unfold its symbolic-analytical problem-solving capacities.

6 It is now common wisdom that on-line ‘stand alone’ courses with all their e-learning facilities are best placed to cater for the diversified needs of a diversified international student body. By blending this approach with face-to-face interaction with teachers and (even more important) other students the EOU and others have realised further learning advantages that flow from social exchange.
In the teaching industry much attention has been given to the rise of the virtual mega-universities such as the EOU, the Anglo-Asian Academy (AAA) and the Delphi-Phoenix Program (DEPP) that operate on a global level with virtual multi-language programmes. The AAA has major home bases in the UK, Australia, China and India and serves more than 600,000 students while DEPP with some 500,000 students has its largest sites in the US, Greece and Egypt. Recent figures confirm, however, that across Europe most undergraduate students still study in national or regional universities. These too offer mixed-programmes based on face-to-face teaching with some ICT-support based on interactive learning and communication. Their major competitive advantage lies in experience-based learning programmes for contextualised knowledge applications that are strongly linked to the local embeddedness of the global knowledge economy. Inter-university alliances between these universities and the many local low cost providers of tertiary education are a widespread phenomenon. Such agreements regulate the cooperation and division of work between the institutions; student, staff and programme exchange; as well as contractual relationships with companies who recruit staff on the university’s turf and send employees for further training on a regular basis.

In 2020, the themes of ‘change’ and ‘diversity’ dominate any analysis of the horizontally (division of work) and vertically (reputation) stratified European university landscape with its approximately 3,500 universities. A core of more visible and prestigious institutions that see themselves as European Universities are surrounded by a growing number of usually smaller more localised ‘Universities in Europe’. Stratification was inevitable. Driven by quantitative (massification and internationalisation) and qualitative (complexity and interconnectedness) growth, it led to increased levels of volatility and fuzziness in the system. The fuzziness encouraged much finer-grain and flexible differentiation of institutions than those of the age of higher education institutional ‘types’. Nowadays universities bundle and un-bundle their tasks in teaching, research and service, their (multi-)disciplinary profile, their geographical outreach and their embeddedness in a web of shifting organisational configurations within and beyond the institution.

Obviously, academic leadership and institutional management mean different things and assume different forms according to specific organisational profiles and context. The development and dissemination of professional and ethical standards as well as basic principles and tools for university leadership and management are two of the

---

7 All courses and material are made available in English, Spanish, Chinese and Hindi – the latter language was introduced over the protest of Indian academics who argued that English fitted perfectly well with their goals. Many students make use of the Intelligent Interpretation Generator which provides electronic tools for all the possible translation permutations between over 400 major languages and dialects.

8 The biggest ‘university’ in the world is probably the Boundaryless Institute of Non-Governmental Organisations (BINGO) although its exact size is uncertain. Its virtual campus and several regional knowledge sites around the globe offer no credit courses or degrees but provide an enormous amount of up-to-date knowledge and know-how. (Many academics who argue that BINGO quality control is quite dubious are known to make use of it themselves).
functions of FLUXUS, the global network of university managers.9 ‘Leadership for change’ and ‘management of flows’ (knowledge and capital) are the names of the governance game in higher education and research – the art of sailing a ship under permanent reconstruction. Consequently, leaders and managers find themselves more involved with people than with structures that will change anyway and are perceived more as temporary enablers.10 In this context strategic leadership (following the principles of ‘distance, morality, responsibility and reform’), network management (‘bring the right people together’) and personnel policy (‘I know my people’) form the building blocks for universities’ advocacy coalitions and linkages.

Learning-Working Pathways: Students and Structures

Student numbers have not changed dramatically over the first two decades of the 21st century but the composition of the student body certainly has. In Europe’s greying societies, the number of younger traditional students has declined and is counter-balanced by a growing number of international students (with the most dramatic increase in postgraduate training11), part-timers and life-long learners. Most undergraduate students gather their credits and credentials over the course of a cross-organisational and cross-national learning journey – which makes it no simple task to count student numbers and to ascribe them to an institutional home-base.12 ICT-networks between universities and other knowledge providers and every-day physical mobility around the globe allow students to mix face-to-face classes with online courses at universities across regions and countries. These patterns of multi-organisational affiliation characterise large parts of the academic professions as well. Public-private researchers, for example, hold shifting contractual relationships with different organisations within the knowledge cycle and wandering academic gypsies (part-time teachers) are usually affiliated to a number of local and regional low cost (and low salary) institutions.13

---

9 FLUXUS is financed mainly via its ‘brain hunting’ activities – recruiting academic leaders and managers ‘across the board of knowledge networks’.
10 The fight between the two schools of thinking in FLUXUS – the Matthew school (‘To those who have will be given’) and the Robin Hood school (‘Take from the rich and give to the poor’) is more about the use of financial incentives in universities.
11 It is estimated that about one-quarter of Europe’s Masters-graduates and one-half of its PhD-graduates come from a non-European home country. A first tide of Asian students was followed by a wave of Latin-American students and increasingly students from Africa and the US are adding to the flood.
12 The most reliable data and information on student numbers is found in the European Higher Education and Research Observatory founded by Professor Frans Kaiser. His data simulation model is based on the premise that you cannot know at the same time the exact numbers and the exact locations of students, graduates and staff.
13 All organisations, however, are required to follow the basic standards agreed upon between the European Trade Union of Knowledge Workers and the European Association of Knowledge Producers.
In 2020, some kind of Bachelor-Master structure has been implemented in all European countries and for all degrees – you cannot live without it. To enable mutual recognition, bi-lateral and multi-lateral agreements have been concluded to provide an overview of the bewildering variety of programmes and degrees that has developed within the Ba-Ma structure (3+2 years, 3+1+1 year, 4+1 year) and beyond. Short cycle programmes in under-graduate and post-graduate studies are widespread. Many of them are designed for graduates with work experience and other knowledge workers with a need for further training. Some serve a growing student body of ‘life-long learners’ whose interest goes beyond the more immediate purposes of the job market. Others are designed to give an innovative push to the labour market to create jobs and positions that do not yet exist but that are predicted to play an important role in the near future. Information and certification services to assist (potential) students to select their ‘menu à la carte’ and transform it into a readable degree have become a mature business in the learning industry. The recognition of prior learning and (work) experience is also common practice and is coordinated by the International Student Selection and Placement Partner Organisation. Further selection is organised by the universities themselves who adopt different strategies. Some universities have opted to be highly selective to retain their institutions ‘small and prestigious’ status while others have chosen a strategy of attracting as many students as possible – aiming to become ‘big and prestigious’.

At first glance the structures for the 2-year professional doctorate and the 4-year research PhD (usually organised in inter-university doctoral schools) look more straightforward. But the growing international and disciplinary mobility of doctoral students, students moving between professional and research tracks and between different research organisations, and the phenomenon of the so-called mid-career doctorate have all combined to create a much more colourful PhD journey.

All in all, the universities of 2020 are diversified structurally and in terms of modes of study and courses provided. Greater attention is devoted to generic competencies, social skills, and the lifelong learning function. Modular programmes designed for better integration into learning-working pathways, and practical learning beyond the class room have tended to blur the distinction between initial and continuing degree studies as well as between young adult, mid-career, and post-working life training. This trend towards ‘life-span’ training also reflects the enormous immigration of younger knowledge workers from Asia, Latin-America and increasingly Africa and the US, and the growing demand for the validation of competences (rather than credentials) from the flourishing network economy. In general graduates do well on the European labour market – and increasingly in careers beyond Europe. The growing virtual and physical mobility of students within global university partnerships and networks facilitates not only greater workplace mobility between Europe and the other continents, but also mobility on more equal terms.
Quality Assurance

‘Quality’ thus stands for supporting a diversified student body to acquire a mixture of skills and knowledge adaptable to new and changing configurations in the workplace and beyond. The European Accreditation Network (that is linked to its counterparts in other regions) works directly with the universities to assure common standards (some call them ‘the smallest common denominator’). These are supplemented by international private accreditation agencies (mainly active in business studies, law and medicine where they interact with international professional organisations) some of which employ more selective criteria and promise more prestigious rewards. Many observers believe that the rise of internal quality assessment procedures has had an even stronger influence on the ‘culture of quality’ within the universities. Periodic reviews by inter-departmental and inter-university bodies together with the widespread use of student assessments and post-graduate labour market surveys provide rich tools for ongoing internal discussions on how to maintain or improve the quality of education.

A number of organisations provide guides with quality rankings based on information provided by the universities themselves or by expert assessors in other institutions. Among these are the bi-annual rankings of undergraduate programmes conducted and published by the magazine *International Higher Education*, and the ranking of doctoral schools every four years by the European Research Council. The most widely used information source is provided by students and academics themselves. The Virtual University Observer is facilitated and fuelled by international student and staff associations. This platform gathers and compares statistical information and university rankings provided by the various higher education and research portals. More importantly, it provides and systematises first hand information on the profile and quality of institutions, services and workplaces in terms of criteria beyond traditional ‘academic excellence’.

Funding of Learning

The system of funding for universities has certainly encouraged the various developments in higher education sketched earlier. Government remains the dominant sponsor of higher education institutions but public money now derives from heterogeneous sources for equally heterogeneous purposes. Regional, national and European governmental entities and their arm’s length agencies provide some direct subsidies, in many cases designed as matching funds based on contractual relationships. The bulk of public money enters higher education via a European voucher system that covers the right of all citizens to a four- to five-year study period.¹⁴ The vouchers can be used in any EU member state for full cycles of

---

¹⁴ This funding system came just in time for the (student and teaching intense) social sciences and humanities disciplines that found themselves in a precarious situation during the period when innovation was perceived to be a matter of science & technology only - with all the consequences this had for university funding.
Bachelor- or Master-programmes as well as for certain training modules across the full post-secondary spectrum. The ESB (European Student Bank affiliated with the European Central Bank) organises the money flow and provides further loans to those students who choose more costly study programmes or longer periods of post-secondary training, and to the intake of international students.

Research Funding and Structures

Research is funded separately from teaching via the national research councils, the European Research Council (ERC, established in 2006) and various public-private sponsors and foundations. Most of the research funds are allocated to research programmes. The bargaining about research priorities is a major area of political debate between scientific elites, regional and national governments, research councils, the ERC and the European Commission. These programmes are intended ‘to support research projects in designated areas of strategic relevance for innovation and global competitiveness based on peer review for scientific relevance’ – a compromise formulated after the establishment of the ERC in order to integrate research money from ‘Brussels’ into its portfolio. The bulk of research funding for universities derives from national sources based on (another political compromise) ‘semi-open’ national systems of research funding. Foreign scholars from within the EU are eligible for funding provided a ‘home-based’ researcher functions as the principal investigator. Equally importantly, European and National Research Councils assess applications not only on scientific or technical merit but also on their wider social application – thus giving greater prominence to social utility.

Another problem concerning research funding arose after the achievement of the so-called 3%-target (3% of GDP on R&D spending in the former EU by 2010). While the target had already been achieved by 2009 it became clear that it was too modest to provide sufficient financial backbone for a ‘Europe of Knowledge’ to become the world’s leading player. Various policies were adopted to increase support from public sources but the key breakthrough was only achieved when major companies changed their practices (and perceptions of investment in R&D as being a ‘private loss’) and started to invest in international research consortia. As importantly, access to finance became easier for SMEs as increasing numbers of regional public-private innovation networks were established to link the various actors in their clusters. The increase in private investment has been of major benefit to the research-intense universities who had already started opening their doors (and budgets) to joint industry-university activities.

Most have organised their research in inter-faculty and inter-university units that are comprised of flexible and semi-permanent teams in self-organised centres with control over, and responsibility for, costs and revenues. Face-to-face contact with partners

---

15 Different agreements regulate if and to what extent former students will have to cover the costs of the used vouchers after graduation. Fellowship programmes for the special support of low income groups are fairly common adjuncts to vouchers.

16 Extended peer review involving not only scientists but also stakeholders affected by the use of science is now common practice and is integrated into overall accountability frameworks that extend beyond traditional quality control procedures.
interested in knowledge transfer forms the basis for cooperation with business and increasingly with other organisations and interest groups. Strategic alliances, the insourcing of private R&D, and mixed university-company campuses are organisational responses to the new mix of funding opportunities, changing university research missions and novel research technologies. Academics themselves are the major players and drivers of these developments towards a greater overlap between the realms of academia and the commercial world. The major generation change within academe brought more faculty into universities who are able to balance the self-dynamics of scientific discovery with those of academic entrepreneurialism. Significantly, research-active academics now gain a considerable part of their personal income from capitalising on their know-how. (The ‘money for value’ declaration of the 2012 Warsaw conference of European Ministers of Innovation finally opened the door for this policy.)

**Nodes and Holes in Network Europe**

In this brave new world of network Europe, the struggle for hegemony has certainly not been abandoned – and it has many faces. Regional disparities across Europe are an enduring problem for institutions and policy-makers. Such disparities have only been partly overcome by the EU-subsidies for the further development of a more balanced landscape for European higher education and research. (Resources have been reallocated from the agricultural sector to knowledge-producing industries.) Major concern remains over the gap between the so-called ‘teaching intensive’ South and East of Europe and the ‘research-intensive’ North and West. This concern overlaps with the realisation that some small countries (such as Finland and the Netherlands) and some cross-national regional clusters (like the ‘golden triangle’ on the Belgian/Dutch/German border) still get far higher returns from R&D and knowledge industries than others. By starting earlier and investing in a flexible and cooperative way in infrastructure and networks for education and research these areas of Europe were able to leave some of the ‘big tanks’ in Europe behind. Finally, the potentials and limits of inter-university alliances are on the agenda as well. The recent decision of the European Cartel Office not to allow a consortium agreement between the Max Planck Institutes, the Centre National de Recherché Scientific, the Ford-Renault Institute of Technology and a consortium of leading research universities (led by Oxbridge) has been widely debated. Some accept the argument of the Office that such a consortium would constitute a ‘monopoly of excellence’ that would harm competition within Europe. Others argue that such cooperation is a prerequisite for competition with other consortia on a global level.

In this debate, most academics who are not confined to local or national settings consider themselves cosmopolitan rather than European. Their main thrust in transcending the academic’s traditional national emphasis is global rather than European. The policies and infrastructures chosen by universities seldom make clear conceptual or pragmatic distinctions between the European on the one hand and the international or global on the other. In the many worlds of academe, happily networking scholars search for partners wherever the knowledge is to be found.