

OECD/CERI workshop on “University futures and new technologies”

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Summary report

List of Participants:

1. Professor Dan ATKINS, Professor and Dean, University of Michigan
2. Professor Paul DAVID, Professor of Economics, Senior Research Fellow, Stanford University
3. Professor James DUDERSTADT, President Emeritus, University of Michigan
4. Dr. Joseph DUFFEY, Senior Vice President, Laureate International Universities
5. Dr. Peter FREEMAN, Assistant Director, National Science Foundation (USA)
6. Mr. Lauritz HOLM-NIELSEN, Senior Advisor for Post-Secondary Education in Latin America, The World Bank
7. Mr. Richard HOPPER, Tertiary Education specialist (Asia), The World bank
8. Dr. Clifford LYNCH, Executive Director, Coalition for Networked Information
9. Dr. Diana OBLINGER, Vice President, EDUCAUSE
10. Dr. Malcolm READ, Executive Secretary, UK Joint Information Systems Committee
11. Prof. William SAINT, Tertiary Education specialist (Africa), The World bank
12. Dr. Jamil SALMI, Acting Director, Education, Human Dev. Network, The World Bank
13. Dr. Nicolas SANDERS, Higher Education Adviser, Department for Education and Skills (UK)
14. Dr. James SPOHRER, Director, Almaden Services Research & Innovation Champion, IBM Almaden Research Center
15. Professor Frans VAN VUGHT, former Rector Magnificus (Vice-Chancellor), University of Twente
16. Ms. Margrethe VESTAGER, Former Minister of Education, Member of the Danish Parliament
17. Professor David WARD, President, American Council on Education

OECD Secretariat:

18. Mr. Kurt LARSEN, Senior Analyst, Private Office of the Secretary General (SGE)
19. Prof. Thomas SCHULLER, Head of Centre for Educational Research and Innovation (CERI), Directorate for Education
20. Dr. Stephan VINCENT-LANCRIN, Analyst, CERI, Directorate for Education
21. Mr. Andrew WYCKOFF, Head of Division, Economic Analysis and Statistics Division, Directorate for Science, Technology and Industry (DSTI)

I. General advice and comments on futures studies

The first discussion was devoted to general comments on the best ways to develop futures studies. What is most useful, effective, difficult, etc., in futures studies?

Usefulness: How to ensure that futures studies have an impact?

One difficulty is that futures studies (and scenarios) are made for specialists and are difficult to use for “outsiders”. Another is that they require both academic skills (high intellectual involvement) and political skills (decision-making understanding and power). Few people have both skills, which explains why it is so difficult to have effective futures strategic activities. Scenarios should, however, be articulated with government decision-making. Another difficulty is that, even if some experiments embody some desirable futures, it is generally very difficult to create change by scaling up experiments.

Mapping opportunities and providing frameworks of action are the most useful elements of futures studies. Detailed roadmaps and ideas that are too focused, that is translation of scenarios into reality, should be avoided because politics comes back in: they are thus often problematic. Besides trend analysis, quantitative evaluation of scenarios is useful.

Methodology and process

First, as a basic rule, it was noted that scenarios should not be confused with predictions, that consistency should not necessarily be their aim (reality is actually not consistent) and that extrapolation could lead to overestimation of the short term and underestimation of the long term.

On the other hand, it was argued that the short term was also important, in terms of decision making, but also for methodology purposes. We need to better understand the present to understand what we are trying to change. Moreover, the 5-15 years future already exists somewhere: one should look at what is already happening, possibly as experiments.

The study of the past (history) generally relies on counterfactual analysis (what would be the result if x or y had occurred?); generally, this method reveals how much one would need to know to answer the question. Futures studies tend to skip the transition problem, that is to say the processes that lead to the scenarios: they do so as if scenarios were not only consistent but represented some sort of equilibria. It is important to take these transition processes into account.

In the process of the study, talking to users and to the people we serve leads us to think differently and this is very important for futures projects. In the present case, it would be important to involve students. Several questions could be addressed: 1) how can universities do what they do better?, 2) what do nations want from their higher education systems?, 3) what percentage of the population should be within the system?, 4) what should they learn?

One example

Jim Duderstadt presented a futures activity carried out by the US National Academies, based on confidential discussions between university stakeholders with same function in competing institutions: first, presidents of universities, and then followed by provosts the plan being to do the same with faculty and then, possibly, students. The questions “where do you head?”, “what excites you?” and “what are you afraid of?” led to very frank, interesting and quality discussions where views about the future and strategic plans were shared.

II. Impact, opportunities and challenges of IT

Dan Atkins introduced his discussion paper (circulated beforehand to the participants) and stressed that higher education should be understood as made of knowledge (knowing), linked to a community, and credentialing. After introducing the concept of cyberinfrastructure, he showed the versatility of technologies and stressed their relationships with the social environment. The use of technologies allows full participation in the life of the knowledge communities possible through a variety of means. The relaxation of time and space constraints are important features of IT. They can lead to a more learner-based approach to education.

		TIME	
		Same (synchronous)	Different (asynchronous)
Geographic Place	Same	P: Physical mtgs. I: Print-on-paper books, journals F: Hands on labs, shops, studios	P: Shared notebook I: Library reserves F: Time-shared labs, shops, studios
	Different	P: AV Conference I: Web search F: Online, real time instruments	P: Email I: Knowbots F: Autonomous instruments, session objects

He stressed that technology is just one of many forces that will have an impact on the future of higher education and that there is no technological determinism: cyberinfrastructure is a cross-cutting force that could enable higher education to better meet the needs of users. Cyberinfrastructure is in addition of physical infrastructure: all quadrants of the time/space matrix above should be explored simultaneously. After noting the increasing links between cyberinfrastructure and the openness movement, he claimed that e-learning, e-science and e-social improvements should be thought of systematically, not independently.

A discussion followed.

Bi-directional causality

It is important to understand the two directions of the causality between cyberinfrastructure and higher education. Cyberinfrastructure offers new opportunities and challenges for higher education, but how does the emergence of cyberinfrastructure create the need (and possibly new needs) for higher education?

Cyberinfrastructure and competition

The dynamics of tertiary education can be seen as a race for reputation (individuals, programmes, institutions) and cyberinfrastructure could be seen in this context. Cyberinfrastructure is a reputation object: investing in it increases the reputation of the institution or group of institutions benefiting from it.

There are currently pressures to change the balance between competition and co-operation: were cyberinfrastructure to reinforce competition, this would at the expense of many new opportunities it offers. On the other hand, higher education institutions are mimetic but they are enormously heterogeneous in the same (and different) parts of the world: one should thus think of higher education as a portfolio of higher education institutions.

Social software and gaming

Why are universities so long-lasting? What do students value about college? Reflecting on these questions is very important. We know that technology is not the answer. Studying students' behaviour is very important. Understanding universities as a community is also very important because students value this link to a community. They want to be in a community of scholars. Cyberinfrastructure enables many small communities. Moreover, what does the emerging visual literacy mean for the future?

In that respect, the area of "social software" or "social computing" should be investigated (e.g. www.nmc.org), as well as the area of gaming. Multi-user games relate to visual literacy and to establishing links with a community. The age of game users increases and some games can be seen as educational (for example when they simulate an economy). One question could be: how to use games for higher education? In some fields, like engineering, education is based on problem-solving: gaming could probably be applied to this kind of problem-solving driven education.

Students prefer to talk to peers, including on the internet, where there is not much discrimination about information: this may represent a way forward, breaking with the hierarchical organisation of learning.

Humanities, welfare, values and cyberinfrastructure

People are looking for wealth and welfare: how can cyberinfrastructure improve that? It would be important to also investigate the possibilities offered by cyberinfrastructure to humanities. A project is currently underway at the American Council on Learned Societies¹. The multi-use or versatility of cyberinfrastructure was stressed, as it can be used for forecasting natural disasters through to computing or storing information.

Digital divide, age divide, and other problems for access to cyberinfrastructures

The importance to think about the digital divide was recalled, particularly as some parts of the world like Africa lag way behind. While e-learning could be an opportunity of leapfrogging, the digital divide could widen the gap between rich and poor countries. It was noted that the digital divide can sometimes be explained as an age divide, younger people tending to be more computer-literate. But the term "divide" was questioned and dismissed as a misleading metaphor: "uneven access" and "uneven resources" could be more appropriate terms. This state of unevenness is sometimes transient, sometimes self-reinforcing. Again, it is important to look at the dynamics in order to know whether it will disappear or not.

There are several modes of access and participation in cyberinfrastructure, as it represents a continuum from low to cutting-edge technology. In that sense, there are possibly cheap ways of participation for developing countries.

However, it was also noted that the lack of financial resources was the main limitations for using what scientists invent and can do. Intellectual property rights were not seen as very important and considered as a problem rather than as a solution. Contrary to some beliefs, they do not generate much income for universities. Moreover, the values of openness and transparency of universities were seen as incompatible with patents and intellectual property rights.

Investment in Cyberinfrastructure: who pays and who should pay?

Currently, it is often the taxpayer, but also universities also pay for some of it. Malcolm Read presented briefly the JISC activities in the UK and the SURF activities in the Netherlands. A multi-

¹ <http://www.acls.org/cyberinfrastructure/cyber.htm>.

investor strategy appeared as the most appropriate. Cyberinfrastructure is important in knowledge economies and societal infrastructure is also important.

There is a growing reluctance to have cyberinfrastructure based on proprietary software: it reflects and contributes to the growth of open software.

Virtual universities

“Virtual universities” were absent in the discussion until the OECD Secretariat invited comments on the idea: can it be the future for higher education? The common view was that virtual universities could not really match the quality of physical universities, but that they were important in developing countries where they were often the only option. Open and distance learning is more important in less affluent parts of the world.

The model of virtual universities was seen to have failed because it rested on a too narrow vision of education. Some aspects are important though, like the full access to libraries, which can provide a much richer approximation of traditional universities.

However, everybody agreed that universities should work in all quadrants of the time/space matrix presented by Dan Atkins (see above). Physical universities still have to think of other ways of doing things, e.g. using video for lecturing and using face-to-face methods for more difficult tasks. Physical convening is still very important.

There are 3 steps for e-learning: 1) putting teaching pages on the web; 2) approximating the richness of traditional universities; 3) inventing better ways of educating. Currently, e-learning is still in step 2.

III. Other driving forces than technology

Margrethe Vestager reflected on what was said during the morning in a short presentation that linked new technologies to broader societal issues. In her opinion, the future will have to reinterpret the basic mission of universities: teaching (with the goal of 50% of a cohort having a degree); research; society engagement (what are the expectations?). One should remember that efficiency is subordinated to societal reasons. Given most countries’ participation goals (50%), ICTs are important, and these goals can be reached only if one invests in ICTs. Credentialing is also important. It might be cleverer to give young people credentials for what they learn in gaming than use gaming to teach something else. In that respect, the universities’ monopoly of credentialing might go. Finally, trust is a key issue. Who can we trust to give the credentials? Will the technology last? The most effective way may still be to put the knowledge in people rather than in technology.

Three topics came back recurrently in the discussion that preceded and followed her presentation: 1) homogenisation or heterogenisation of tertiary education systems (the impact of globalisation), 2) homogenisation or heterogenisation of higher education institutions (stratification or not), 3) the impact of an expanded participation in tertiary education.

Globalisation

Globalisation could lead to global communities in science and new kinds of institutions at a global level. The increasing demand for higher education in the developing world should be considered as an important driver of the future of tertiary education. Globalisation also represents competition for talent: higher education is a pool of talents and there is a clear search of countries to attract talents, students as well as faculty, in their country or economy. In this respect, cyberinfrastructure can be used as a means to keep talent at home and connect with the rest of the world, as it is for example in South Africa.

Outsourcing, language and Multi-National Enterprises play a very important role in this area. Regional drivers will also be important: for example, China represents about 21% of the world's workforce.

In the context of international competitiveness, universities' social engagement may go beyond the national culture (like in the Humboldtian model). Universities are nodes in global network systems. Should they disengage in national social issues?

The situation is mixed though and globalisation is not a uniform phenomenon. One should bear in mind that some countries (for example most countries in Africa) are still very nationalistic and that, in other regions, countries (and jobs) are open to foreigners. Because of culture and history, things will be different in Europe and in North America. People's mobility should not be overestimated: some people will not move because they do not want to, so that higher education has to move towards them, possibly thanks to technology.

Nations will not disappear, national identities will stay important. Globalisation should respect national cultures. For example, it is important not to sell a unique education model worldwide (e.g. the US one). Were the Bologna process to lead to a homogenisation of the European systems, this might not be a good move.

Diversity of higher education institutions

Part of the discussion acknowledged the increasing diversity of higher education: higher education could certainly not be equated to universities. Higher education institutions are not segregated nor necessarily in competition: students in community colleges (2-year education) are for example not segregated from those attending universities. Business schools have executive education as their bread and butter; others provide corporate training; some institutions like the Smithsonian museums give full courses; and corporate universities replicate traditional universities.

There will be no necessary homogenisation of tertiary education. For example, it is difficult to know whether the current entrepreneurial spirit in (US) tertiary education will last permanently or not.

The rise of market forces

The boundaries between public and private institutions are blurring. The rise of the private for-profit sector is important – like the rise of the religious institutions, which have been very efficient at using technology for recruiting. Some saw the shift towards business as too rapid and important. In the US, there was a large increase in tuition fees over the last years. Have things gone too far? In Europe, the fiscal pressure will lead tertiary education to be increasingly privately funded. In the UK, public funding has decreased to about 60% of the tertiary education institutions' resources. Deregulation is also an important trend.

Young people demand education, but they do not know what they want. How could they? Asymmetry of information is at the heart of education. The rise of market forces might create a need to preserve some fields, to safeguard the public interest.

Universities' economic role

Do universities have an economic role? If yes, which one? This becomes an increasingly important question given an increasing fiscal pressure in Europe. The problem of the efficiency of higher education will become more acute, in terms of duration of studies and completion rates.

Public expenditure at the margin has higher returns in tertiary education compared to other sectors, which makes of it a good sector to invest in. But universities are increasingly seen as a tool for

economic performance. They are seen (and possibly become) increasingly disconnected from societal engagement.

In the US, higher education has to justify its role: there has been a shift in trust because people do not know what higher education is really about. While the trust level is still high, people do not know what they trust. Whereas people do not have a high trust in higher education, they highly trust the institution that educated them. The future of higher education is limited if this trust is not rebuilt. Among the reasons for trusting higher education, social mobility and civic engagement should be ranked high (see e.g. Frank Newman's work).

Stratification of institutions

Having world class universities requires money. This might only be possible with a stratification of higher education. The structure of the academic profession will be affected. Research concentrating in few universities might become the norm.

The increase of participation also induces stratification and diversification of the system: in that sense, homogenisation is not likely to happen (and will probably not be the outcome of the Bologna process in Europe).

Expanding participation

Is the (UK) 50% of participation target sustainable? Can it be justified? Not really. There are however cultural and educational advantages – if not economic – to have a large participation in higher education. Why would the expansion need to take the form of higher education? Some people are not ready to learn when they are 18 although they might be ready to do it differently later on in their life. The willingness to have great expansion is labour-oriented and favours short programmes funded by employers.

With governments willing people to hold more degrees (e.g. a target of 50%), how long will degree-holders have a payback for their investment? When does it become a disadvantage to be part of the minority that does not go to university? When does it lead to exclusion? A challenge for tertiary education is to keep academic values while teaching people to create their own jobs.

Another question is how/whether the rise in tuition fees changes the participation in tertiary education. For example, will the new British system (with higher tuition fees and loans) change the participation in tertiary education? Participation has not decreased in Australia after the (re)introduction of fees and the introduction of income-contingent loans.

There is currently a risk of gender divide if things continue as now: men will make money while women will make degrees. The risk would be to have a societal divide with women mostly working in the public sector and men in the private sector.

New technologies can be important for expanding educational participation, e.g. the prison population that is mostly made of young black males in the US.

What should people be taught? Services revolution

It is important to study the demand, as demand (for tertiary education or for skills, etc.) will always be the main driving force: services are currently the main demand in industrialised economies. A services revolution has occurred in industrialised countries: products now have to be wrapped in services. For example, services represent 50% of IBM's activities. Organisational change has to be sold with new products. There is a lessening of the division of labour, with services cutting across all skills. The

dynamics of technology should be understood simultaneously with organisational change and business. This has to be taken into account in when considering what tertiary education teaches students.

New ways for research

The ageing population may carry out research, especially applied research, with a new role of whimsical research, cross-disciplinary issues. Observational research and communities of amateurs are gaining ground. The role of “researchers in the wild” (Callon), generally families with medical problems, is also documented and leads to different ways of using research resources. This could become more important in the future.

Trust and credentialing

Who certifies people’s skills? According to human capital theory, educational systems are screening systems evaluating people for employers. This would explain the stratified system: this might represent a low efficiency for teaching, but it is useful for employers. In that respect, increasing the rates of participation implies a devaluation of the credentials and an additional (and possibly new) screening on top. How expensive should this screening function be? A question in the US is whether accreditation as a non-government process can survive.

Informal transcripts of school degrees are developing in the US to allow transfers to colleges, etc. The same happens in Europe with the ECTS (Bologna process).

Finally, tertiary education will have to respond to the hype of irrationality (religion, terrorism, etc.). In the US, religious schools are the second growing sector after the for-profit sector: this puts pressure on curricula and contents of what is taught.

IV. Discussion of scenarios

Stéphan Vincent-Lancrin presented six scenarios that were provided beforehand in the background documentation. The scenarios are extracted from the last section of his paper “Building futures scenarios for universities and higher education: an international approach” (*Policy Futures in Education*, 2004, 2/2, special issue on “University futures” downloadable at www.worlds.co.uk/PFIE). The two first sections of the paper deal with international trends in tertiary education and methodology. They were not presented.

At what kind of scenarios should we aim?

It was noted that the current scenarios included elements at both the institution and system levels. The system level should however be considered as a more relevant level than the institutional level.

The scenarios can be read as a system description or a typology of institutions that is very close to the present system. It can also be seen as the description of a university (with its diversity of activities), given the diversification and networking that have developed over time.

The target group makes a difference for the scenarios: it might be too ambitious to have every stakeholder as the target. It is important to know clearly *who* the scenarios are supposed to provoke. On the other hand, it was argued that stakeholders could think of what each scenario would imply for them; in terms of process, a “requirement” analysis could be implemented: what does each scenario require of different stakeholders?

As a result, two uses of the scenarios and sets of questions could be considered.

When considering/addressing institutions, which of the scenarios should be implemented within institutions? The scenarios could be looked at in terms of the needs and aims of specific institutions. For example, community colleges should be in scenario 5. Scenario 6 corresponds to the MIT's idea of "ecology of learning" (rather than "disappearance" of institutions).

When considering/addressing the system level, the question might be concerned with the distribution of institutions. Maybe the ultimate scenarios could be different distributions of the current scenarios. The scenarios should not be seen as exclusive: like for the time and space matrix, institutions shall work in all quadrants of the system, and the ultimate scenarios would be a share distribution of institutions or tertiary education in each of the current scenarios: how many people should get their education from each of the different types of institutions?

The whole possibility space is not feasible in the sense that each of the scenarios has different implications in terms of cost, funding, training, access, or of the required infrastructure needed and affordable. It could be interesting to quantify these implications to better assess their likelihood, feasibility and maybe desirability in different contexts.

Process and Dimensions

In their current form, the stories do not help to understand how (and why) the dimensions were chosen. The difference between a fantasy and a scenario is that the latter should indicate how one arrives at the described state and include some explanation of process and transition. One should remember that the world is much messier than scenarios though.

Maybe the stories could thus have some process elements and emphasise more the trends and driving forces that were analysed elsewhere?

Another question is what counts as drivers. It was recalled that universities were actors and that driving forces were not necessarily like external pressure. It is important to differentiate institutions: about 75 US institutions clearly control their destiny (but this is not the case of all of them).

The impatience of the political system should also be seen as a driving force: people want everything at the same time and quickly, and politicians have to take that factor into account. Is policy a driver or a response to the situations? For example, financing can be a driver.

It is important to better understand how people learn to assess whether new technologies provide (or can provide) better ways of learning. This would be another driving force for the future of learning.

Simulation models could be used for the development of the scenarios (see Ausubel and Massy and their simulation project: Virtual U: <http://www.virtual-u.org/>).