Liberal Education for a Complex World: The challenge of remaining open.

Ladies and gentlemen, I am honoured to have been invited to talk at your esteemed university on the matter of liberal education in our globalising world. I have used the freedom you have given me to attempt to address some big themes. I beg your indulgence if not all these ideas are as yet perfectly formed. Indeed, that itself is one of the themes of this talk: that in periods where there appears to be considerable change, we should be generous in allowing some speculation and attempts at creative thinking which may not meet all the conventions of academic rigour. If, therefore, at any point I fall short of this rigour, I hope at least that it is in the cause of productive thinking of a speculative sort.

The title of this talk was inspired by my students, several of whom have told me that their studies have taught them the benefits of 'keeping an open mind'. It contains several assumptions. We might list these as: The world is complex; some version of Western liberal education is good for educating people for this world; the concept of 'openness' is an integral part of the liberal tradition and there are challenges in sustaining this concept and implementing it.

There are, therefore, three preliminaries to talk about:

1. The Complex World
2. Liberal Education
3. Openness

Let us look briefly at each of these before turning to the main theme of our title: The challenge of remaining open.

1. The Complex World

The idea of 'complexity' is much in fashion. It is discussed in many parts of academia, the commercial and political world, and even recently on popular shows such as the BBC's radio programme 'In Our Time'.

Complexity is a property of 'complex systems'. Some well-known examples of such systems are: the human brain; ecological systems in the natural world; transport networks and business organisations. The mathematics of complex systems can quickly become sophisticated but the main ideas are easy to understand. The complexity scientist, Yaneer Bar-Yam, writes: '"Complex Systems" is the new approach to science studying how relationships between parts give rise to the collective behaviors of a system, and how the system interacts and forms relationships with its environment' (Bar-Yam, 2002).

It was the insight of the American scientist, Warren Weaver, in 1948 (Weaver, 1948) that, following a period of the analysis of 'simplicity' (which he equated with Newtonian science)

and a subsequent period focussing on analysis of 'disorganised complexity' – that is, systems of many non-interacting parts (which he equated with the statistical sciences of the 19th century) - we are now in a period where the systems of interest are those of 'organised complexity', i.e. those consisting of many parts which interact with each other. Weaver was aware that as well as questions of science, many political and economic problems might be addressed by considering politico-economic systems as those of organised complexity. Today this approach has indeed spread to areas well outside the hard sciences and includes systems of individuals, machines, organisations, and so on.

It is widely acknowledged that due to increasing interactions, both between humans themselves and between humans and their environment, we live in a world which is more complex, in some meaningful way, than it was, say, 50 years ago (see e.g. Taleb, 2014 and Pfister, 2011 for two examples almost at random). Our growing understanding of complexity has developed in parallel with a world in which complex systems are increasingly evident.

How might we best educate young people for this world? We will return to this question later.

2. Liberal Education

The roots of what is called liberal education in the Western tradition are usually traced back at least to Cicero (106-42BCE)[1], but there will always be some disagreement about an exact starting point. One can claim that something recognisable as a liberal tradition begins at least with Socrates over three centuries earlier.

In Socrates' form of education we see also the first intimations of the connection between liberal education and democracy. Although Socrates was arguing against many aspects of the Athenian democracy in which he found himself he was, as the philosopher Karl Popper points out, using many of the values and processes of that democracy to do so. Thus in the teaching of Socrates we see: greater equality between teacher and student; the role of reason in education; the challenge to authority; the importance of self-criticism; the importance that 'the individual should prove worthy of his liberation' (Popper, 1962, p.189) and finally, by implication at least, the realisation that social norms are mutable – and ultimately our responsibility.

For Cicero, liberal education was education 'worthy of a free person' (i.e. not a slave) (ref) as well as a way of liberating the mind[2] and something like this view of liberal education became incorporated in the seven liberal arts (of grammar, rhetoric, logic – the Trivium; and arithmetic, music, geometry and astronomy – the Quadrivium) which dominated Western universities for the best part of 1,000 years, between the foundations of Bologna in 1088 and the reshaping of universities in the German and French models in the early 19th century.

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[1] In fact many scholars – historic and current - start with the older contemporary of Cicero, Marcus Terentius Varro (116-27BCE), whose 'De Novem Disciplinis' (On the Nine Disciplines) informed Cicero's thinking (see e.g. Parker, 1890)

[2] In fact this double meaning – that liberal arts is in some way both *for* the free and in order to *make* one free – is due to a combination of the thinking of Cicero and Seneca. But we can gloss this point here. (See e.g. Rice, 2006)

Of course it would be a gross exaggeration to say that such a conception of education was always associated with freedom or an open development of the mind during this long period. But some vestige of Socrates, Cicero and other early educators remained in the spirit of Western education throughout, and was revived in the liberal arts colleges of the United States in the 19th century. There it persists in the general conception of higher education to this day.

Now we are seeing a revival of interest in liberal arts and sciences in the UK at UCL and King's College London. And, most interestingly of all from a historic perspective, there is growing interest in India, China and Japan. We will return to conjecture on why we are seeing these developments.

3. Openness

This is the hardest of our three themes to define. It is a grand concept in the vein of 'equality', 'compassion' or 'liberty'; something big but vague, identifiable but imprecise. Yet it is no less important for that. We should not shy away from talk of such things, even at the risk of disagreement and misunderstanding.

As we have seen, in the case of Socrates, there is a link between a liberal education and democracy. Many Western thinkers, from John Dewey and, in our own times, Martha Nussbaum and Gert Biesta, have written on this connection, but it was Popper, in *The Open Society and its Enemies*, who developed the understanding of an 'Open Society' and forged links between this concept and democracy. Popper's analysis of openness can be applied to all human systems, including systems of education. Let us then use this analysis to think about what openness might look like in an educational context.

Popper contrasts an open society with what he calls magical, tribal or collectivist societies. These latter are societies in which 'fate', 'the gods' or 'others' (Popper, 1962, p.173) are to blame for imperfections. In such 'closed' societies, personal decisions are minimized or imputed to others in order to divest oneself of personal responsibility. There is no expectation that society might 'change itself' or that the individuals who comprise that society are ultimately responsible for it.

However, human societies are, on a proper analysis, inherently open and changeable, because they are the continued and evolving responsibility of the humans who constitute them. Popper is aware of the burdens this places on us. Indeed, perhaps second only to the depth of analysis of the open society is his repetition of the 'strain' this openness places on the individuals within it. Thus the Greeks suffered 'a severe strain…which had begun with the rise of democracy and individualism' (1962, p.170), and the 'revolt against civilization [is] a reaction against the strain of [the] demand for personal responsibility' (1962, p.5). This strain leads to a longing for more closed societies; but this is a mistake. There is no 'perfect state', no 'golden age' and there are no 'laws of history' that might take us to such a state. There is only the law – if we may call it that – that the future is open and in our gift. Popper did not use the language of systems analysis but it is clear that his discussion of 'society' can

be widely applied to human systems. Such systems must allow for evolution, criticism, revision, the challenge to authority and the possibility of 'piecemeal change', as Popper called it, if they are not to contradict the openness that comes with the very fact that it is rational, mutable, problem-solving creatures – ourselves – from which they are made.

Open systems appeal to our universal humanity, then, but they also demand a lot of us. They cause us strain or, as we might say in contemporary English, 'stress'. In such situations it is all too easy for us to turn away from them, to get tired of the responsibility they demand and to destroy them when the 'strain' becomes too much.

If we are to champion the concept of openness in human systems, we cannot be naïve about their many failings. They are always messy and always imperfect. Nevertheless, I believe Popper is right: if we are not to fall into cynicism and despair we must defend the openness of human systems. For 'if we wish to remain human, then there is only one way…We must go into the unknown, the uncertain and insecure, using what reason we may have.' (1962, p.201)

Having examined the three themes of our title – the Complex World, Liberal Education and Openness of human systems – we will now attempt some connections.

Some Connections

We return to the question of growing interest in liberal education in many parts of the world today. Why might countries as different as China, India and Japan, with their own rich histories that owe little to the thinking of Socrates, Cicero and others, consider such an education of value to their young people and to their country?

Here I must turn to both the central and most speculative part of my argument. It could be that the combination of significance and speculation is inevitable at this stage: we are searching for new ways of conceiving and a new language with which to operate. I am only attempting to give a preliminary lie of the land, a description of a scenario in which openness, liberal education and our complex world are connected. It will take more work to describe these connections with greater precision.

We have seen that the world is now more complex, and also that a liberal education is open in that it is concerned with criticism, evolution, and the possibility of change. It remains to argue, or at least indicate, that it is this openness that can give rise to complexity in the educational context and that the person educated in this environment – an environment in which they are introduced to more complex ideas and asked to carry out more complex tasks – will be better fitted for more complex situations in which they find themselves after graduation.

In fact, I think both these connections – that between openness and complexity and that between a more complex education and being better prepared for more complex

environments - are somewhat common sense, even if not usually discussed in these terms. To consider the first connection, imagine that a human system is closed to outside influences and that its rules and processes are established and not allowed to evolve. It is hard then to imagine how it could become more complex. If no new relationships are introduced into the system, and internal innovation and developments are repressed, where would increased complexity come from? We can see examples of such education systems in totalitarian regimes and fundamentalist theocracies. The body of knowledge and the methods of teaching are fixed. Students are barely, if at all, positively exposed to developments in other cultures; even scientific work which challenges fundamental tenets is suppressed or banned. We are subsequently not surprised if students emerging from such systems do not have what we might call a complex world view.

We can extend this argument. For if we acknowledge that a closed education system does not allow for increasing complexity and the lack of a complex education will not prepare us to understand a complex world, then it is a matter of logic that in order to cope better with an increasingly complex world we need an education which, in some sense, introduces us to complexity and this, in turn, must be open.

What would it mean for us to be educated to better handle complexity? And how might such an education look?

In this space, I can only very briefly address these questions, but the work of developmental psychologist Robert Kegan can help us here. Kegan's position, based on many years of longitudinal study, is that there are several developmental stages of increasing mental complexity, extending well into adulthood. This complexity increases our capacity to take multiple perspectives on a problem, and even to see ourselves as in some way 'multiple'. There is an embracing of plurality, not at the cost of relativism but with an enhanced ability 'to understand the other's position *on the other's own terms*, to extend empathy for the costs involved in altering that position, and to provide support for, rather than dismissal of, the prior position' (Kegan, 1994, p. 334.) At this stage of development, the subject sees the possibility of increased complexity as a possibility for growth, not a problem to be 'solved'. Kegan has interesting things to say about the advantages of such a mindset for both leadership and conflict resolution – such things as might apply to university graduates in a variety of situations - and his thought gives us one way to understand what it means for us to better cope with complexity and to see the value in achieving this understanding.

How might we educate for this? Well it seems clear to me that we must be brave in presenting students with complex ideas. Simple matters of fact will not constitute such an education and the curriculum will need to include so-called 'wicked' problems which have no obvious solution and on which many will disagree. The tasks we set our students should also be complex in some way, for example by including several variables which they will have to negotiate. A team project is one way to inject complexity into an assignment and there are other ways, such as asking students to view a problem from two disciplinary

perspectives, or asking them to apply a concept or technique learned in class to some situation outside the classroom, where more variables generally come into play.

Kegan is circumspect about asking that all people achieve his '5th level' of mental complexity, arguing that some forms of mental development can only happen later in life, towards middle age. But I would like to be bolder. Although we cannot expect, and perhaps should not even want, everyone to achieve this level of mental complexity, I think that if such a level were to become better understood as a cognitive phenomenon, then it would also become teachable to younger people. We have precedence in related areas, for example, in the teaching of empathy to small children in the Roots of Empathy programme in Canada (Roots of Empathy, 2014). Once societal norms are better understood, it becomes possible to teach them to younger generations.

This discussion of the connections between openness, complexity and the sort of education that might benefit our students for a complex world is necessarily brief. I hope I have made the prospect of such an education attractive, even if much is still imprecise.

The Knowledge Revolution and Forms of Reaction

But if the argument for a more open education seems attractive, if it is plausible that to negotiate a more complex world, your education must expose you to more complex ideas and tasks, why then do we face difficulties in maintaining this stance? Why the 'challenge' of this talk?

The reason, I think, takes us back to Popper and his analysis of a widespread tendency in the way we react to changes in human systems. For, quite simply, 'we are in the throes of a revolution' (Naughton, 2012, p.9); not a political revolution (at least not yet), but rather a revolution in many aspects of our relationship with knowledge. There is something unsatisfactory about this phrase 'relationship with knowledge', for what could we leave out of such a relationship? But its use indicates that we are seeking a way to describe intimations of great change brought about by what the technology historian John Naughton calls 'radical transformations in our communications environment'(2012, p.9). These changes promise to be more global than previous knowledge revolutions, due to our greater connectedness.

And the changes that are already with us, coupled with talk of greater changes to come, are putting a strain on many aspects of our relationship with knowledge. We argue about what is known, what should be allowed to be known, how to teach it, what we should learn, how to conduct research, how much to respect academic authority, how to understand the nature of expertise, the role of universities and so on.

This strain we feel in the light of these changes is analogous to strains felt during shifts in previous political certainties. As the technology writer David Weinberger notes, they are making us 'uncomfortable' (Weinberger, 2011, p.67). In Popper's analysis, he traces the

desire of Plato for a closed society to the experience of unprecedented societal disruption. Similarly, this radical disturbance in our relationship with knowledge has us longing for a 'golden age' of stability and certainty, when we could rely on 'authority', and even 'innovation' itself was despised[3].

In education as in politics: in times of change often the impulse is to stop the change, repress innovation, micromanage, over-constrain, divest oneself of responsibility, blame others for failure, only value what we can measure and only conceive of measuring what we already know. In education, too, the temptation in times of uncertainty is to systematize more: more box-ticking, more spoon-feeding, more tightly defined 'learning outcomes', more bureaucracy and more standardized testing.

Ultimately, however, to stop change requires constraining forces and in the world of human affairs this requires repression, even violence. The ideal longed for in the closed systems of which Plato dreamt is that in which there is no change. The illusion is that such closedness can give us lasting security with none of the strain that change brings. But how dangerous this can be - in politics as in education!

In fact, in times of change, this closing down of our systems is the *opposite* of what we should do. Rather than a reactionary retreat, we should meet the challenge of uncertainty and embrace the value of being open. This is not easy, as many champions of democracy have found in closed political systems, but in the educational sphere it is the important challenge to educators today, faced with upheavals caused by the internet and changes in our relationship with knowledge.

These upheavals require new approaches. However, as we have indicated, many of the values of a classical liberal education can enable its practitioners to find such approaches; for the values of such an education manifest themselves, in a pedagogical context, in the idea of openness. In openness lies the fundamental notion that whatever human system we inhabit can be changed. As educationalists O'Hear and Sidwell say, at the deep level 'liberal education is concerned with matters of intellectual praxis and motivation' rather than 'the imposition of particular points of view' (O'Hear and Sidwell, 2009, p.8) and this level of generality, properly understood, can allow for us to make the necessary changes.

The UCL Experience

These are, one might say, 'fine words'. And even one should never dismiss the power of words and the changes in perception that they can induce, I understand the need for at least some practical indications of what we might do, what the first steps should be. So I will try to give a brief indication of what we are attempting at UCL.

I want to make it clear at this point that we are not making any claim to be revolutionary or uniquely original. In some ways on the contrary. In some ways we are reapplying the historic and tested educational values and approaches of Socrates, Cicero and the US Liberal Arts

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[3] See e.g. the famous passage from Francis Bacon's Novum Organum, section 40, in which he rails against contemporary universities who accuse anyone who is not 'imprisoned in the writing of certain authors' (read: Aristotle) of being an 'innovator' – taken to be an insult at the time.

system, while rethinking our curriculum, our assessments, our bureaucratic structures and our educational philosophy in the context of UK higher education and the global changes outlined above.

Further, I make no claim to be a theoretical expert in this field. What we have learnt – or more accurately, are learning - is the result of what is called 'action research'. That is, we are seeking to change some of the rules, parameters, philosophy, goals and ambitions within our community of practice by a cycle of innovation, implementation, measurement and reflection.

Our first move, when planning the degree, I would describe as 'setting the frames high'. This means, in a fairly general way, we tried to use some of the principles of Universal Design (universaldesign.com, 2014) to form a curriculum which, while having a frame, nevertheless allows for maximum diversity and individuality of study within it. The principles of Universal Design grew out of an approach to the built environment, adopted to increase ease of access and use, especially for those with disabilities. Certain of these principles such as *flexibility*, *intuitiveness* and *tolerability for error* are also applicable to curriculum design. One way in which this manifests itself is in allowing students to take courses across a range of departments, including in such combinations as literature and engineering or biology and philosophy which may have had little to do with each other for decades, if at all.

It is important to note that a more 'open' educational system does not mean an anarchistic system, just as a more open society does not mean an anarchistic one. We do have a structure –as can be viewed at our website – only it is perhaps more 'universal' and more open to evolution (as one of our students described it) than some degrees.

Having set our frames high, we try to allow students to move into this 'universal space' in the way which most interests them. As one example of this, we try to set assignments which may go in individual ways. We often allow students to be creative in their assignments. This can be straightforward when setting assignments in new media, where students often have more interesting ideas than their teachers and are more proficient in realising them! But it is also possible in more traditional forms of assessment. So, to take an example from this lecture, we might teach students about the concept of Complexity, but then ask them to produce an essay showing how this concept could be applied to an area of their interest – be it Economics, Anthropology, Engineering or Literature. Of course we advise and guide students in the process but we try to be open to the possibility that the student may take the assessment in directions we had not predicted.

In my experience, whenever one mentions the possibility of allowing students to be more creative there is a worry about 'rigour', but I think this is misplaced. Teachers must never lose their standards: of grammar, logic, mathematical accuracy, literary quality and so on – but these can be applied in the form of critical dialogue with the student, even in cases where the work produced is somewhat new to the teacher. Indeed, for a teacher to show the confidence that they can engage intelligently with new material is itself an important lesson for students to see. As most professional lives will now involve numerous occasions in which one meets new material, new ways of working and new cultures, the ability to

greet such novelty with an open yet critical mind is a valuable ability in itself. This is what I understand as one of the attributes of a 'lifelong learner', much prized by many industries today (see e.g. Deloitte, 2014). Most likely this cannot be taught as a set of formulae and propositions, but it can be demonstrated by example. Be open with your students who produce new work and say, 'well this is new to me but I think this bit works and this bit doesn't – and for these reasons'.

Of course there are substantial administrative and cultural challenges that come with this more open approach. On the administrative side, the main challenge is tension between 'the iron cage of bureaucracy' which seeks standardisation and (over-)regulation, and the desire to keep an open, creative environment which is increasingly more reflective of the world outside of universities – or at least the best of that world, the parts we aspire to, the parts in which many university graduates will operate and, one hopes (!), the best parts of academia.

Another administrative issue is that such an individualised approach to learning is time-consuming for teachers. Again, there is no quick fix here but one can try to delegate to younger staff where appropriate and even to more senior students on the programme who understand the value of openness and are confident enough to adopt this approach. This is not always easy. There will be strain. But just because it is not easy does not mean it is not a good way, maybe the best way, to proceed.

I want to emphasise again that much of this is not new. At some of the greatest universities in England and the US students have considerable freedom in their studies. At UCL one innovation we are making which is not generally allowed to Oxbridge students is to allow undergraduates to cross the humanities-sciences divide, so long the combination is meaningful and productive. We encourage students to seek their own interdisciplinary combinations. Thus on the Arts and Sciences degree we have students studying combinations of Engineering, Law and Development Economics (to understand better the nature of large-scale engineering projects in developing nations), or Computer Sciences, Philosophy and Art History (to seek to understand better the connections between general cognition and the appreciation of art), and other fascinating combinations. However, the broader principle of a more open education has long been understood by many traditional academics. It is only that the maintaining of this openness is a constant challenge as higher education becomes more of a mass process and the reactions to change we noted above impinge upon it; in this environment, openness will need constant psychological and intellectual vigilance to maintain.

There are cultural as well as administrative challenges. Within the UK the school system has become very test driven and numerous voices express a concern that 'students can no longer think for themselves' (see e.g. The Guardian, 2009). Some of these concerns may be the repeated historical mistake of believing that things were always better in the past, but certainly if we wish to espouse a value of openness in education as the best way to deal with change and complexity, we need students to enter into the culture and spirit of this enterprise and, indeed, to think somewhat for themselves. Socratic dialogue requires, at least (!), two people and this form of education cannot make much progress if students are

not willing or able to take responsibility for their learning and to treat their teachers with respect but without blind deference to authority. This shift in students' perception of a teacher from someone of almost mythical status who 'knows so much and must be believed' to someone who is essentially an equal, albeit someone with more knowledge and experience, is something that is perhaps more difficult to negotiate in cultures which are less democratic or open; but it is also problematic in the more informal West where younger students can find it hard to achieve a middle ground between a respect born of fear and a lack of respect for those they may feel are 'only' peers.

I have mentioned that in a sense our project at UCL is 'action research', but how will we know if this conception of higher education has worked? What kinds of data might we collect? How will we judge whether we have anything like a body of theory upon which to build?

Ultimately, I think the answer is simple: it will have worked if the students think it has worked. If graduates are able to articulate why this form of education has been of value of them, that is evidence enough. To find this out we can simply ask them. But we also have some proxies, some more quantitative measures that might satisfy those who seek proof by these means.

In no particular order these are:

1. If students score good grades according to the criteria of the institution;

2. If they get good jobs upon graduation;

3. If they are able to progress to masters and research degrees of their interest.

So far all of these measures are positive for the Arts and Sciences BASc. Our students have already been offered excellent graduate posts in law, financial services, consultancy, manu-services, journalism, marketing, and so on, and one of our students has launched his own tech start-up which we have assisted him with. The grades are strong and comparable to established single-honours degrees and our finalists are applying to masters programmes in public policy, energy systems, law, development and many other areas.

As we develop we will need to guard against the closing of the rigid jaws of bureaucracy, the bland and stifling systemization which can come with established processes and philosophies. We too will have to work at 'remaining open'. It is the only way we will be able to evolve to educate our students for a world of increasing complexity and to meet the exciting challenges that the knowledge revolution is presenting to us.

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