The Place of Higher Education Institutions: The dynamics of the local, national, and global

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Abstract: This paper examines the distribution of students in tertiary education across six broad cognate areas of study. Using data collected by the UNESCO Institute for Statistics since 1999, it suggests that there is neither uniformity across countries, nor obvious signs of convergence toward uniformity, either globally or regionally. This empirical evidence is placed in a context that views institutions as complex, self-organising systems, capable of selecting those external stimuli that will affect their development, and ignoring those that will not. This view of organisations emphasises the importance of their histories in shaping what they are likely to do in the future, with national systems of higher education, for example, showing strong tendencies to continue past patterns into the future. These observations have important implications for how educational institutions are managed, and how policy is developed.

Keywords: Butterfly Effect, Complexity, Global, Local, National, Self-similarity

Introduction

Higher education, perhaps more than any other sector of education, stands at the junction of different currents of influence. Universities are national institutions, in the sense that they are governed by national regulations. Although a large proportion of the universities in the world are private, even those are subject to national regulations about quality, and many receive substantial amounts of public funding, either for tuition or for research. There may in some far-flung corners of the globe be universities that receive no funding at all from government, either directly or indirectly. But even those institutions will be functioning alongside public institutions and work in an environment that is shaped by national expectations and norms. At the end of the day, the environment in which universities function must be understood in terms of national jurisdiction over higher education.

But while acknowledging the national aspects of higher education, universities are much more than national. Since the founding of the European university tradition in Bologna and Paris a

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millennium ago, universities have been international organisations, drawing students from different countries, and having internal structures that reflected that diversity. Today, especially when considering research activities, scholars think of themselves as being part of a global network, and reference to their "peers" may conjure up an image of similar scholars on the other side of the world.

In terms of teaching, the picture is different. While universities draw their students from around the world, the large majority of students in any institution will come from within the host nation state. And, in practice, the student body may be drawn predominantly from a much smaller region than the nation itself. In this sense, universities are local institutions, having ties to the local community that are stronger than their links to the world beyond. Young professionals will experience their practical training in the local schools, hospitals, law firms and businesses. Applied research projects may be chosen because of their links to the local economy, and may even be supported by partnerships with local firms. As employers and service providers, universities may play an important, even a dominant, role in the broader community. And the history of the institution may have its roots in common soil with symbolic elements that are important in the local mythology.

Faced with this complicated confluence of pressures shaping the university, it has been suggested that higher education should be viewed as the seat of complexity, or even super-complexity. Barnett (2000: 257), for example, argues that: "A complex world is one in which we are assailed by more facts, data, evidence, tasks and arguments than we can easily handle within the frameworks in which we have our being. By contrast, a supercomplex world is one in which the very frameworks by which we orient ourselves to the world are themselves contested". This paper argues that this misses a central point about complexity, namely that complex systems show certain patterns or regularities in their behaviour that are quite distinct from the patterns of behaviour exhibited by non-complex systems. Complexity is not about handling variety easily, but about the possibility of managing variety at all. The concept of supercomplexity is redundant, in the sense that, properly understood, complexity already subsumes supercomplexity.

In the literature on complexity, complex systems are sometimes described as "self-organising", and this phrase casts an important light on how such systems can be expected to behave. By explicating the concepts of complexity, this paper describes how such self-organising systems might be expected to behave, and then uses data from the UNESCO Institute for Statistics (UNESCO, 2016) to illustrate some of those behaviours in universities.

Because UNESCO data is collected at the national level, the behaviour of national systems of higher education are examined. This indicates that national systems are complex systems in a formal sense, and therefore do not respond simply to external stimuli. This leads to speculation about individual institutions as complex systems, and the question of whether, from a managerial perspective, institutional autonomy ought to be regarded as an inescapable fact, rather than as a norm or aspiration.

Universities at the crossroads of global, national, and local influences

Universities are subjected to a range of influences that often drive them in contradictory directions. Barnett (2000) notes a centripetal force towards globalisation in the form of a global standard of performativity, but he also notes a move towards supercomplexity, with all that implies for diversity, differentiation, and individuality. He regards the former tendency as being broadly pessimistic, while the latter is broadly optimistic.

At a more instrumental level, trends in research can be seen as being part of a globalising trend. With improved communication, discoveries and inventions in one part of the world are rapidly transmitted universally. Research that does not keep pace with developments at the cutting edge of its respective field is not merely second-rate; it is virtually pointless. And this is embodied in notions of world-class-quality and university rankings, which depend very heavily on measurements of research output. We can see a flattening out of the world, and an assumption that it is possible to compare university performance on a one dimensional scale.

At the same time there is a burgeoning of local identities, and a role for universities in supporting the maintenance of local languages; the support of archives of local history; research into and dissemination of local cultures; and the injection of ideas into local businesses and the local economy. In some cases this will actually be embraced by the institutions themselves, through a "third mission" to engage in locally-relevant research, or through their staff to engage with organisations in the local civil society.

So how can the modern university best be understood? Should it be seen as the instrument of global capitalism and neo-liberalism, disseminating world culture, or should it be seen as a bastion of local resistance to the erosion of local identity? Such debates are generally conducted at the level of rhetoric, with the story being told in ways that conform to the assumptions and prejudices of the teller. Both stories can be told convincingly, but a discussion that quickly descends into polemic cannot settle the question of how a university actually connects with its local and global environments. Instead, the arguments should be held up against what data there is, to see whether the data can inform our judgement as to whether universities are primarily local or primarily global institutions.

The qualification, "what data there is", is important, because data is not normally collected for the express purposes of satisfying the curiosity of researchers, and the data collected by UNESCO is generally collected by national governments in the process of managing their educational institutions. The data may therefore incorporate certain assumptions, as least in so far as the selection of those variables that are deemed worth collecting is concerned. However, some indications may be able to be seen. In the case of university systems, at least it should possible to judge whether there is a homogenising process which makes national systems of higher education look ever more similar, or whether they appear to be responding to stimuli at the national and sub-national level.

Elsewhere (Turner, 2016) the author has argued that the nature of a university's connection to its

local environment is shaped by, and shapes, the subject balance in the university. Universities that specialise in the physical sciences may be obliged to relate to a global environment, whereas universities that specialise in topics of social welfare and education may have much stronger links to their local communities. Concentration of resources, and specific scientific requirements, may mean that in locating a national research centre in astronomy or atomic physics, connection with the local community is hardly relevant at all. Indeed, such endeavours increasingly depend on international collaboration, with scientists having access to data rather than having physical access to the basic scientific instruments of their trade. The situation is very different in teaching or medicine, where engagement with the local community may not only be based on the development of the practicum for entrants to the profession, but may involve multiple and cross-cutting relationships embracing initial professional education, continuing professional development and research.

For this reason, it is worthwhile to examine the balance and mix of different subject specialisations in national systems of universities, to see whether there is increasing homogenisation as universities respond to the needs of an increasingly international labour market, or whether universities follow national patterns, driven by national policies and cultural aspects specific to their location.

A further reason why this is attractive is that UNESCO has collected this data for many countries over the last twenty years, and so the data is readily available. Examination of the national data may indicate that it would be of even greater interest to examine data that uses the institution as the unit of analysis, but that is an issue to which attention will be turned toward the end of this paper.

But before embarking on an examination of the data, it is important to start by developing an analysis of complex organisations, so that complex behaviour can be more readily identified. The development of public policy has been characterised by rather simplistic and mechanical models, which imply that a push in one direction will be followed by a corresponding movement in the same direction by the institution. Such simple approaches include the idea that institutions can be managed through budgetary controls, and that if more funding is provided for activity X, more of activity X will result. However, such mechanical models do not always work for machines, as anybody who has played with a gyroscope will attest; a force pushing in one direction can produce movement in a completely different direction. Complex systems can be even more idiosyncratic in their responses to stimuli.

Complexity

Complex systems, as opposed to ones that are merely complicated, are characterised by several important features. The most famous of these is that they exhibit what has been called the butterfly effect; very small perturbations in their conditions can lead to very large changes in outcomes. What is perhaps less noted, but is equally important, is that huge perturbations in their initial conditions can

have relatively little impact on the outcomes.

The net effect is that complex systems sometimes pick up very small influences and amplify them, while at other times they will suppress huge external influences, and after a little while show minimal effect of large disturbances. And this observation is not a recipe for control and management; while some authors have suggested that managers need to identify those pivotal moments at which a small perturbation can have maximum effect, in fact this is impossible. There is no way of knowing beforehand which influences are going to have a large effect. It is as though complex systems are able to select the influences that influence them.

A second feature of complex systems that has attracted considerable attention is self-similarity. Patterns in complex systems tend to repeat at different levels of scaling. Hurricanes are large scale circulations of masses of air, but they are accompanied by smaller weather patterns, also comprised of circulating masses of air, right down to tiny eddies of air taking dust and leaves in circular swirls at the smallest scale.

These characteristics of complex systems suggest that predicting their behaviour is impossible. One cannot know beforehand which small changes in conditions will have large effects in the future, and the way in which different systems respond to similar stimuli will differ. So that it may be impossible to decide until long after the event which interventions will be effective. If one thinks of human beings as complex systems, then a moment of embarrassment, or a sudden insight might not appear to be significant in itself, but if the person returns to the event repeatedly in their mind when they encounter similar situations, then the self-reinforcing, cumulative effect may be dramatic. And institutions may have analogous events in their histories, most notably foundation myths, to which they return to make sense of present difficulties. As a consequence, the behaviour of complex systems is not merely self-similar and unpredictable, but it is also strongly path dependent. How a system will respond to a present stimulus will depend very much upon its history.

But, while prediction of the behaviour of individual complex systems may be impossible, certain patterns may be present in the behaviour of many complex systems. Such patterns will enable to be confident complex systems are being observed, and to draw a number of conclusions. To understand the profound importance of these observations, one needs to consider seriously the tools used for the most part, to make sense of the world. Normal assumptions are that similar systems exposed to similar stimuli will respond in a similar way. Children from similar backgrounds attending similar schools will perform similarly in examinations. Similar institutions given similar stimuli through similar systems of governance will tend to behave in similar ways. Those similar systems are expected to be grouped around the mean, with extreme divergence from the mean relatively rare, and probably explicable in terms of additional inputs or drivers. In contrast with this, if we start form the assumption that one is looking at complex systems, one would expect that children from similar backgrounds will respond completely differently to exposure to similar environments in school, and will develop distinct tastes and motivations that result in very different performance in examinations.

Similar institutions given similar policy steers through accountable systems of governance will respond completely differently, depending on their history, and how those stimuli are interpreted. Systems will not cluster about a mean value, but divergence from the mean will be large and more likely than one would normally expect. And differences in response will be largely inexplicable, except in so far as the developmental trajectory of the individual system will be more important in shaping outcomes than the external stimuli.

University systems have been subjected, as noted above, to a swath of influences that represent a globalising trend. Universities share, by virtue of the fact that they all claim to be "universities", many common norms which they trace back into history. At the same time, more recent policy trends in higher education have been identifiable on a global scale. Outcome-based funding has becoming increasingly widespread as enrolments have increased and there has been downward pressure on the unit of resource. At the same time, international rankings have increased pressure to improve research performance. These common influences would be expected to produce convergence in higher education systems, unless one starts form the assumption that national systems are able to pick out the influences that will influence them.

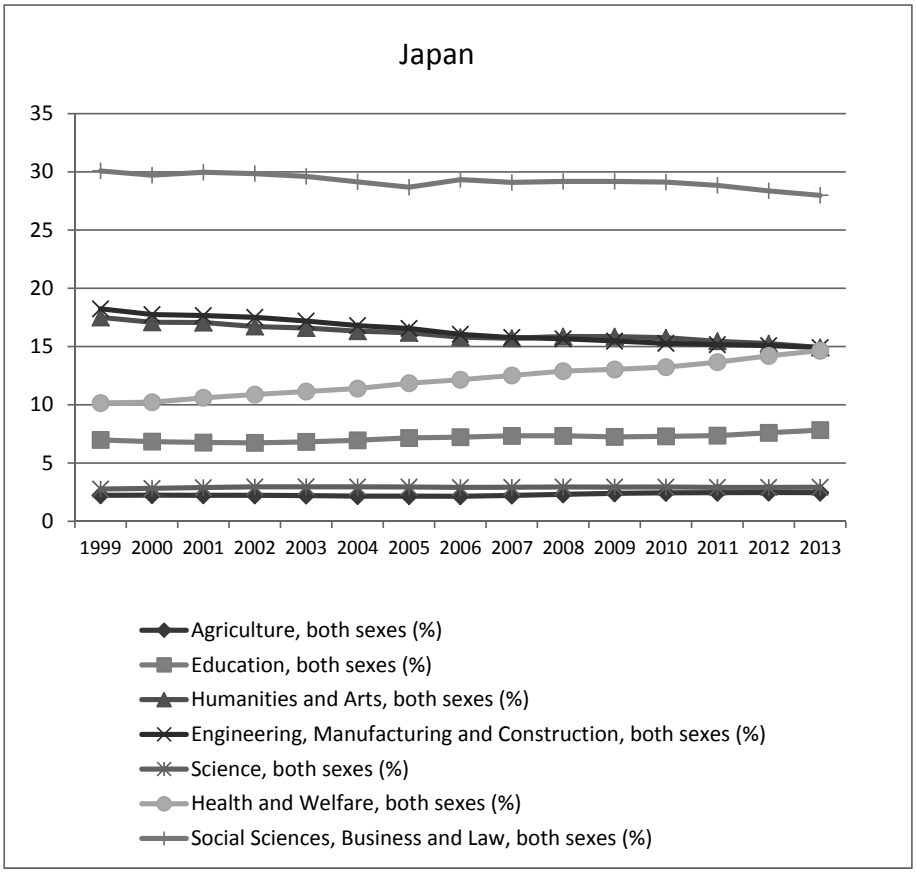

Figure 1. Percentages of students in tertiary education in different subject specialisations: Japan

If one looks at the subject mix in Japanese institutions of higher education (Figure 1) we can see no dramatic responses over the last twenty years to changing conditions. There is a slight increase in the proportion of students in programmes of Health and Welfare. This is consonant with a national concern for an ageing population. But in so far as an aging population is the outcome of demographic trends that have been experienced in many countries, one might expect to see similar movements elsewhere. One does not.

For example, if one looks at the United Kingdom (Figure 2), one sees a rising proportion of students studying Science, corresponding to a government policy to remove public funding from undergraduate studies in the Arts and Humanities and Social Sciences, but no obvious rise in the proportion of students studying in Health and Welfare. But, again, the changes that are brought about by this dramatic change in policy appears less abrupt than might be expected, and appears as the organic response of a system that has its own inbuilt inertia, rather than the switching track of a machine when the controls are moved precipitately.

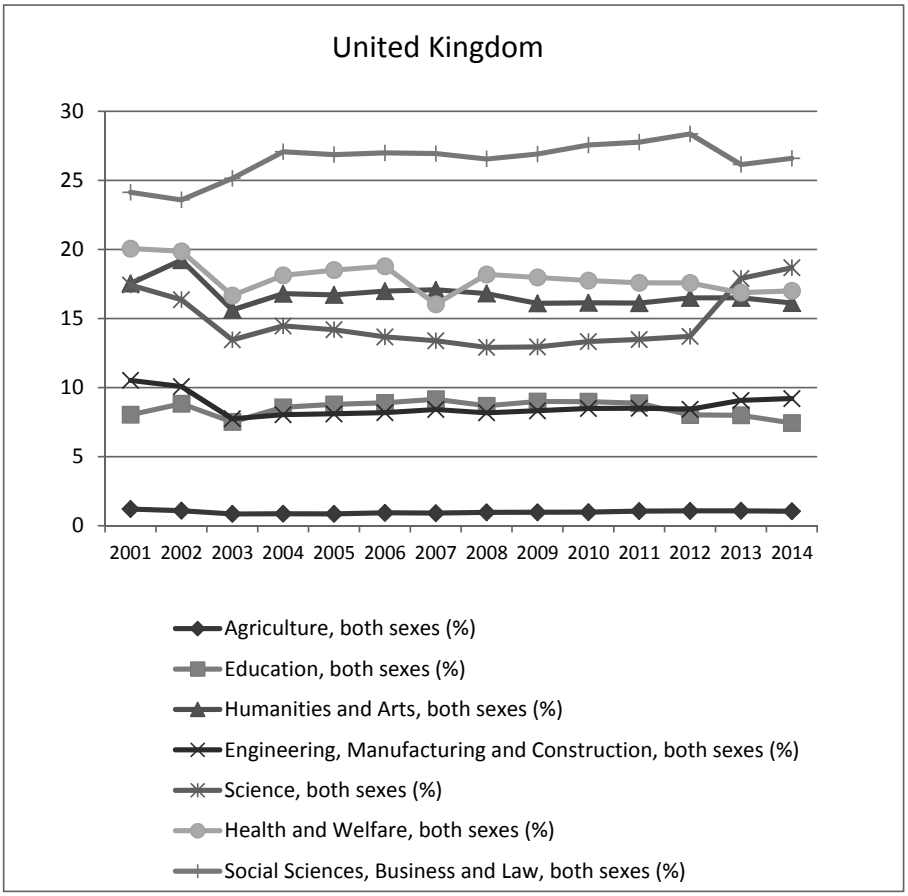

Figure 2. Percentages of students in tertiary education in different subject specialisations: United Kingdom

If one turns his/her attention to Finland (Figure 3), whose educational system has attracted so much attention in the wake of PISA success, one might be surprised to see a very low percentage of students studying programs in Education. This might suggest explanations, such as the different national expectations about the preparation of school teachers, or the high status accorded to university studies in Education in Finland, but these are explanations that relate to the continuity of Finnish approaches, not accounts of the Finnish tertiary education system responding to external stimuli.

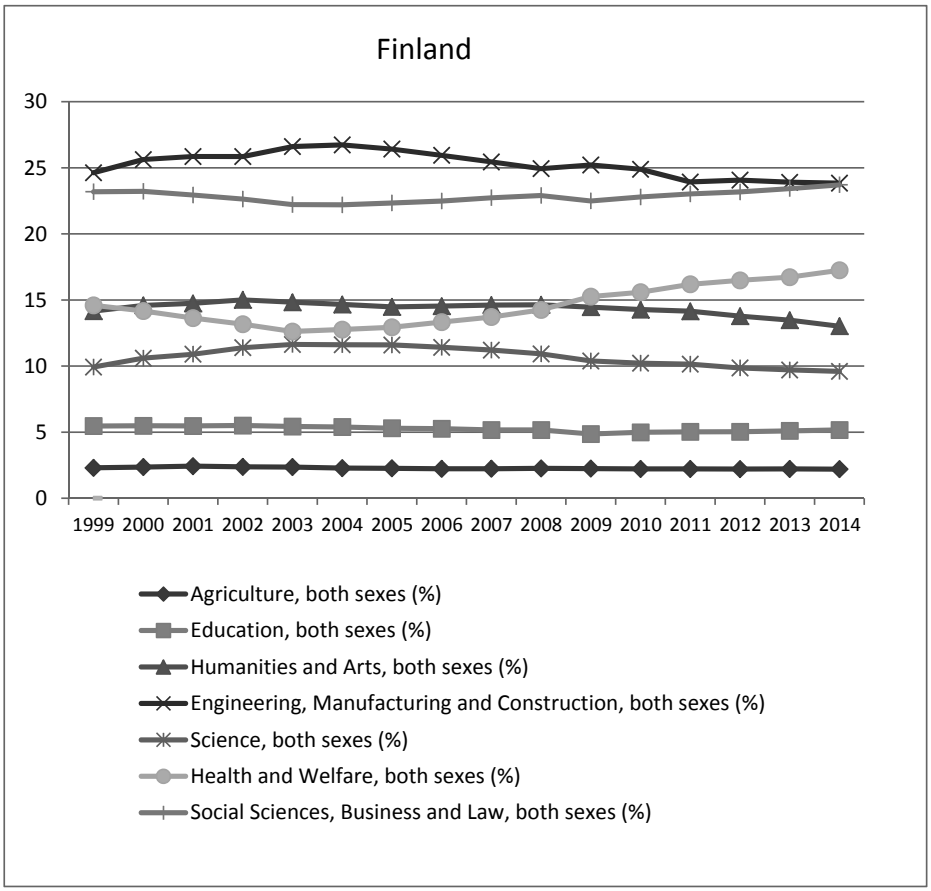

Figure 3. Percentages of students in tertiary education in different subject specialisations: Finland

Some trends are very strongly marked in individual countries, such as the rapid increase in students studying Engineering and Construction in Iran (Figure 4), but there are no corresponding trends in other countries. Even if one looks at countries from a specific region, such as Scandinavia or Latin America, no supranational trends are apparent. But in all cases, the best way of anticipating the pattern of studies in a national system is to look at the past pattern and development trends in that same system.

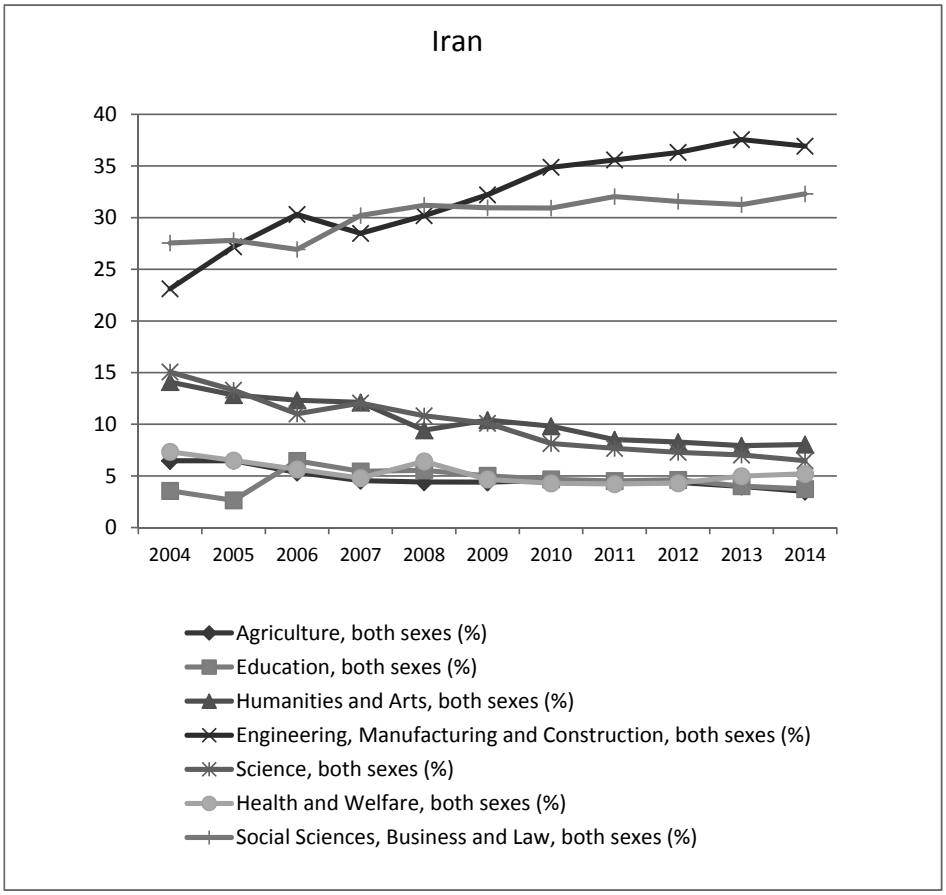

Figure 4. Percentages of students in tertiary education in different subject specialisations: Iran

Policy implications

What this should tell one is that systems of education, as complex systems, are less malleable and responsive to policy than policy makers would suggest. In a paper that brings together an overview of several of his previous studies, Gorard (2006) asks, "Does policy matter in education?" and concludes that the importance of policy in shaping outcomes is proned to be overestimated. This is particularly true of advocates of educational policies, who, Gorard argues, are too ready to accept that their pet policy has borne fruit.

As the present brief look at the evidence for the influence of global trends on national systems of higher education confirms, one would perhaps be better to think of educational systems as self-organising entities that are capable of selecting those influences to which they will respond. As such, and given the likelihood that the selected influences will be those that are most easily combined

with what they are currently doing, the best guide to what an educational system will do in the future is what it has been doing in the past.

This suggests that even quite pronounced changes in the environment of institutions may bring about changes only in the margins of their behaviour. Global trends and even national policy may have only very limited effects. While this conclusion is suggestive of other important conclusions, it must remain tentative, because the present study is limited by the data that is readily available. It would be preferable to look at the data at an institutional level, to see how the histories and traditions of individual institutions affect their responsiveness to external shocks. Do centuries of tradition make an institution more or less likely to conform to the national average than decades? Unfortunately, the data are not so readily available for conducting a study at that level of analysis.

However, the idea that an analysis at institutional level might produce similar, or analogous, results to those coming from this analysis at national level conjures up a vision of institutions which each follow their own path, selecting those influences that will direct them into the future. As each institution follows its somewhat erratic path through its own development, the collective of all those individual complex systems makes up a complex national system which also follows a self-similar path, neither determined by nor determining the path of any institution that is a component of the national system.

Properly understood, therefore, complexity theory does not simply offer a refinement of traditional approaches. It provides a completely different model of causation, as institutions do not exactly respond to, but neither do they exactly ignore, external influences, including policy influences. Instead, each institution and each national system seems to be capable of picking out the influences that will influence it, and minimising or playing down the influences that are not consonant with its current direction.

This observation carries important lessons regarding the context in which an educational change takes place. In relation to national systems of education, it means that context is critically important. Even if there are global trends in policy, and even global trends in politics, preferences and policy, how those external influences impact national systems will depend crucially on local conditions. A historical pathway to the present may shape the way in which influences are either effective or ineffective in bringing about change. And, indeed, the interpretation and response to policy initiatives may also be path-dependent, and be shaped by how the target of policy is moving.

But, perhaps more importantly, it suggests that policies may be most effective when they accord with something in the character and history of the target institution. Policy makers are more likely to be able to have a long-term and substantial impact on the direction of an institution when their policy suggestions are such that the implications of their policies accord with something in the character of the institutions themselves. A university leader who understands the history of his or her institution and can appeal to the key points of reference that the culture of the institution itself hinges on is more likely to be effective than one who makes policy suggestions that have no anchorage points in the

culture and history of the institution.

And that, in turn, implies that "Management" may not be a unified field, but itself be context specific. There has been a growing global trend to see management science as something that is distinct from that which is managed, and suggest that management techniques that are appropriate to business organisations should also be effective in universities, schools, publicly funded enterprises and civil society organisations. Although that assumption of the transferability of policies and techniques from one field of management to another has not been conspicuously successful, it nevertheless persists in the aspirations of many managers, and in the mythology of a global move toward neoliberal policies in all areas.

By way of a corrective to that view, the idea that institutions are capable of selecting and responding to only those influences that find some resonance in their history and culture, might help to explain why educational institutions need to be understood in a context of what they do and what they value, namely learning in all its forms.

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