



## University knowledge in an age of supercomplexity \*

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**Abstract.** For various reasons, it is becoming felt that the knowledge function of the university is being undermined. Some, indeed, have come to suggest that we are witnessing 'the end of knowledge' in higher education. The 'end of knowledge' thesis takes three forms. *Substantively*, it is felt that the knowledge sustained by the university has no particular status: it simply takes its place and its chances amid the proliferating knowledges that society has now to offer. *Ideologically*, it is felt that the knowledge for which the university stands lacks legitimacy: it can simply be understood as a set of language games of a rather privileged set of occupational groups ('academics') that reflects their interests and marginal standing to the rest of society. *Procedurally*, it is implied that the university can now only secure its future by becoming entrepreneurial and by marketing its knowledge wares in forms of academic capitalism; in the process, its knowledge becomes performative in character and loses its power to enlighten. Much of this analysis is correct – even as the theses cut across each other – but the conclusion is wrong. The modern world is supercomplex in character: it can be understood as a milieu for the proliferation of frameworks by which we might understand the world, frameworks that are often competing with each other. In such an age of supercomplexity, the university has new knowledge functions: to add to supercomplexity by offering completely new frames of understanding (so compounding supercomplexity); to help us comprehend and make sense of the resulting knowledge mayhem; and to enable us to live purposefully amid supercomplexity. Knowledge, as a pure, objective reading of the world does have to be abandoned. But the university is not, thereby, delegitimised. In an age of supercomplexity, a new epistemology for the university awaits, one that is open, bold, engaging, accessible, and conscious of its own insecurity. It is an epistemology for living amid uncertainty.

**Keywords:** complexity, epistemology, knowledge, pedagogy, universities

### Introduction: The end of knowledge?

By way of a beginning, we might bring together a number of lines of contemporary reflections on knowledge and the university. These include the following:

- That the university has not just responded to the wider world but has positioned itself *in* the world. The 'entrepreneurial university' (Clark

\* This paper is a revised version of a keynote address given to an international conference at the University of Bahrain, March, 2000.

- 1998) sells its knowledge services in the knowledge economy, so producing its own 'academic capitalism' (Slaughter and Leslie 1997);
- That the university is no longer the sole or even the main source of production of knowledge in society. By definition, the 'knowledge society' (Stehr 1994) is a society in which knowledge is produced in and across society as such;
  - That the forms of knowledge that the university has prized are being challenged by new forms of knowledge valued in the wider world. Essentially, the university has been a site in which forms of contemplative knowledge have been prized; forms of knowledge that sought to describe the world, to represent the world. The new forms of knowledge, in contrast, are performative knowledges: now, what are held to be valid ways of coming into a relationship with the world are forms of action and engagement with and *in* the world (Gibbons et al. 1994).
  - That the criteria for validating knowledge claims are widening. What counts are less statements that are held to correspond to an external world than accounts that have a use value. Put simply, knowledge has to be cashable in some way in knowledge competences (Lyotard 1984).
  - That the means of validating knowledge claims are changing. In a world of ever-rapid change and challenge, careful elucidation of knowledge claims and scrutiny through peer dialogue is being replaced by much quicker forms of accountability. It is not just that processes of textual production and peer scrutiny are being replaced by conferencing and electronic journals. It is also that we are perhaps moving towards a situation in which the motto is: 'buyer beware'. In other words, knowledge becomes simply a commodity, the test of which is consumer reaction.
  - That, all round the world, universities have become more and more 'accountable' to systems of scrutiny by the state. For one commentator, we have moved from the university first of reason, and then of culture, to the university of 'excellence' (Reading 1996). The only difficulty is that, as is pointed out, the term 'excellence' is vacuous; it is an empty concept, susceptible of being filled in any way by any interest. No wonder that everyone signs up to the university of excellence: everyone can be in favour of it.
  - That knowledge has given way to knowledges. As the wider world, in effect, tells the academy that its definitions of knowledge and its means of verifying knowledge claims are insufficiently sensitive to the modern world, with its desires to see rapid external return on investment, Knowledge – with a capital K, as it were – comes to be replaced by knowledges (cf. Gokulsing and DaCosta 1997).

- That, in a dynamic world, in which frameworks, values, images, and identities are expanding and colliding, new challenges arise for higher education. For example, it comes to be understood that forms of action ('skill') have to find a place within the curriculum. Preferably, these skills have transportable properties, enabling individuals to move effectively from one situation to another. No longer are skills in higher education to be tied to forms of knowledge per se (NCIHE 1997).
- That, as the university becomes inserted into society, its epistemologies change: knowledge becomes performative in character and loses its power to enlighten (cf. Lyotard 1984).

Against this background, some raise the spectre of 'the end of knowledge in higher education' (Barnett and Griffin 1997; Delanty 1998) or of 'the university in ruins' (Readings 1996). The 'end of knowledge' thesis takes three forms. *Substantively*, it is felt that the knowledge sustained by the university has no particular status: it simply takes its place and its chances amid the proliferating knowledges that society has now to offer. *Ideologically*, it is felt that the knowledge for which the university stands lacks legitimacy: it can simply be understood as a set of language games of a rather privileged set of occupational groups ('academics') that reflects their interests and marginal standing to the rest of society. *Procedurally*, it is implied that the university can now secure its future only by marketing its knowledge wares; in the process, its knowledge becomes performative in character and loses its power to enlighten.

I do not accept the 'end of the university' thesis. The forms of knowledge that the academic community has favoured may now be threatened; the monopoly over high status knowledge production that the university has enjoyed may be at an end. However, the university is not at an end. New, even more challenging, roles are opening up for it, roles that still enable us to see continuities with its earlier self-understandings built around personal growth, societal enlightenment and the promotion of critical forms of understanding.

### **The new knowledge producers**

Transnational companies are now employing their own 'knowledge officers' (Nonako et al. 1998). Such appointments are testimony to such companies being knowledge organizations such that they are developing their own 'corporate epistemologies' (Von Krogh et al. 1996). Knowledge interpenetrates such organizations on three levels, that is to say their capacities:

- to bring together and exploit, through analysis, existing information;
- to create new knowledge;

- to build systematically knowledge into their own processes and activities, for example, by monitoring and evaluation techniques.

Much of the literature on knowledge organizations focuses its attention on large-scale enterprises. But many kinds of organization can be said to be knowledge-based. Professions, after all, are organizations licensed to practise on clients, using knowledge supposedly in the interests of clients. Today, in addition, many new kinds of company are arising that utilise or exploit or create knowledge, including companies specialising in design, computer systems, financial services and so on. Knowledge, therefore, is being exploited and created systematically outside universities.

A striking feature of this explosion of knowledge-generation capacities outside the formal university system is the rise of corporate universities (CVCP and HEFCE 2000). Especially in the USA, but also elsewhere (including the UK), we are seeing private sector companies – whose main business is the production of knowledge-based products – establish their own universities (Kenney-Wallace 2000). At one extreme, so to speak, such ‘universities’ are just the skills training centres of the companies concerned. At the other extreme, such ‘universities’ are the research and development arms of the companies but now with educational functions attached. In essence, such companies are looking to develop two sets of capacities:

- the knowledges and skills required to develop new products;
- the knowledges and skills required to manage those processes more effectively and more efficiently.

Characteristically, therefore, there would be two ‘faculties’ in such ‘universities’: a science and technological faculty built around certain sciences and technologies (for instance, biological sciences; electronic sciences; computational sciences) and a management studies faculty. Both ‘faculties’ would be organized with the particular needs of the company concerned in mind, the knowledges and skills being developed being framed in terms of that ‘mission’.

Such companies, we can note, are doubly implicated in knowledge creation. Firstly, they will have research and development arms, specifically charged with creating new knowledge-based products. Secondly, they are setting up within themselves educational enterprises aimed at providing a knowledge and skills base among their employees that is likely to aid the development of a company’s knowledge generating capacities (either directly, or indirectly through enhancing their employees’ effectiveness).

Not surprisingly, universities – old-style universities – are getting nervous at these developments. Their nervousness takes different forms:

- A sense that the educational recruits that formerly came their way will now bypass them and go directly into industry: there, they will ‘enjoy’ both paid employment and access to a corporate university;
- A sense that the new knowledge organizations will seek to control knowledge and knowledge products that hitherto have been in the public domain. The potential patenting of human genetic material on the one hand, and forbidding the publication in journals of the reporting of new findings (so as to extract the maximum market leverage) are just two of the more obvious examples of such moves.
- A sense that new research opportunities will be put the way of such organizations. No longer are governments simply putting out to universities invitations to tender for projects: these are increasingly being made entirely open and the research capacities of the private sector are often more sophisticated than those in conventional universities.

These concerns could simply be summarised by saying that universities are fearful of losing their market share, both over the production of knowledge and over their educational function, as high level education is relocated to the private sector. But there are here deeper concerns worth noting.

The new sources and owners of high level knowledge production represent challenges to the idea of the university as such. Historically, the term ‘university’ has come to stand for a *universal* sense of knowledge. ‘Universal’ has three senses: firstly, that there can be no bounds to an inquiry: in principle, any inquiry is a universal enquiry since it might lead anywhere across different domains of knowing. Boundaries cannot be set *a priori*. Secondly, that knowledge is potentially criticizable by anyone. No one can be excluded from commenting on knowledge claims. Knowledge claims should therefore be open, fully in the public domain. In this sense, a knowledge claim is a universal claim. Thirdly, in principle, a university is open to all in the sense that any exclusion is not arbitrary. The European mediaeval universities were international communities, accepting scholars from wheresoever they might come.

All three principles are threatened by corporate universities. Firstly, epistemological boundaries *are* set in advance. On the one hand, there are epistemological boundaries: corporate universities will not be noted for their sponsorship of the study of the nineteenth century novel. On the other hand, knowledge claims and forms of understanding will be prized so far as they might be felt to have cash value for the company, even if that outcome might be some time in the future. Secondly, knowledge claims are kept private to the company; they are not made open. More, natural material substances – such as human genetic material – are turned into a commodity for exploitation

by individual companies. Thirdly, corporate universities, far from being open institutions, are closed to their own employees.

For our purposes here, not too much should be made of these critical points about corporate universities. The emergence of so-called corporate universities is significant here only as a particular trend within the more general phenomenon of the development of knowledge organizations. What such organizations represent, so far as the traditional conception of the university is concerned, is a set of challenges to the assumptions concerning knowledge in the university. Putting it more formally, we see in the rise of knowledge organizations a challenge to the epistemology of the university, from open to closed epistemologies (cf. Horton 1971).

### **The new epistemologies**

Gibbons and his associates have evolved a dual conception of the epistemologies in front of us. On the one hand, there are the systematic corpuses of knowledge, largely contained within particular disciplines. The characteristic claims to knowledge are propositional in form, set out in the journals and subject to systematic peer scrutiny. Gibbons et al. (1994) term this 'Mode 1' knowledge. In contrast, Gibbons et al. point to a new 'Mode 2' knowledge, which they see emerging characteristically in knowledge-based work. This knowledge is not primarily a matter of knowledge being applied to practical situations but is a matter of knowledge-in-use. What counts as knowledge is what is worked out in real-time in the exigencies of the moment; 'problem-solving', as they term it.

Characteristic, too, of such knowledge is that it is interdisciplinary. Disciplines are used as resources, raided wherever they may have a use. A further major characteristic of this knowledge is that it is generated by groups: individuals lose their identity in teams. These teams have relatively brief lives, to be disbanded as problems as 'solved' and to be replaced by new teams, built around new epistemological resources for the presenting new problems. The implication of the argument is that Mode 2 is replacing Mode 1 knowledge and that unless universities adapt more to embrace Mode 2 knowledge, their knowledge functions will be overtaken and they will become redundant.

The thesis is, perhaps, beguiling but it is not compelling. Within its own terms, the thesis is overdrawn. Firstly, Mode 1 knowledge is not yet at an end. On the contrary, Mode 2 knowledge depends, to some extent, on Mode 1 knowledge which – even within knowledge organizations – is drawn on as a resource. On the other hand, universities have been increasingly embracing Mode 2 knowledge. The Mode 2 knowledge associated with some of the

major professional schools, such as medicine and engineering, has long been embraced by universities.

Medicine offers an immediate refutation of the Mode 1/Mode 2 thesis not only in that it sustains Mode 2 knowledge but that this Mode 2 knowledge is incorporated into the medical curriculum. Admittedly, Mode 2 Knowledge normally comes after Mode 1 Knowledge: medical students are characteristically required to acquire much formal Mode 1 Knowledge in biology, microbiology, biochemistry and anatomy, before they are seriously encouraged to develop medical skills; but 'academic' forms of knowledge that have recently been added to the midwife's repertoire. What is new, however, is that the complexity of knowing is now on the agenda. There has arisen an interest in the more pragmatic, tactile and communicative forms of knowing. What was once simply caught in Ryle's phrase 'knowing-how' (Ryle 1949) is now being disaggregated: we are now beginning to interrogate and reveal the multilayered character of knowing-in-the-world.

### **A supercomplex world**

These reflections on the epistemological context in which the university finds itself are but a case study in what might be termed a world of supercomplexity (Barnett 2000a). Complexity we may take to be that state of affairs in which the demands before one exceed the resources to meet them: consequently, one is faced with an overload of data, entities or clients. Such conditions can generate real challenge, and even stress, but they are in principle manageable, if only one had more resources. Supercomplexity, in contrast, arises under conditions of a conceptual overload: in short, supercomplexity is the outcome of a multiplicity of frameworks. This is precisely what we have just encountered in our reflections on the epistemological hinterland of the university. No longer are the boundaries, or the forms of right knowing clear.

It is not that the old forms of knowing have been discarded; to the contrary, as we have seen. To the old definitions of knowledge have appeared rival forms of knowing, claiming legitimacy. Once we are inside a framework, the rules are more or less clear; the difficulty is that, in the modern world, we can no longer be sure as to which framework we are to inhabit. Or, to put it differently, there are a multiplicity of knowledge frameworks to inhabit; as we have seen.

Such a world of supercomplexity is characterized by certain features which are captured especially in four concepts, namely contestability, challengeability, uncertainty and unpredictability (Barnett 2000a). These four concepts are surrounded by others such as change, turmoil, turbulence, risk and even chaos. Together, this set of concepts mark out the conceptual

geography of our supercomplex age as an age of fragility (Barnett 2000a). It is an age in which nothing can be taken for granted. In short, all bets are off. It is an age of conceptual and, thereby, emotional insecurity.

This supercomplexity is not to be confused, we may note, with postmodernism. On the classic definition, postmodernism is to be understood as 'an incredulity towards metanarratives' (Lyotard 1984). Nothing could be further from the situation being picked out here. For, under conditions of supercomplexity, we are faced with a surfeit, an embarrassment, of frameworks; and some pretty large frameworks at that. Is knowledge a matter of contemplation or of action? Is it a force for controlling the world or for communicating with it? Is it ideologically free or ideologically saturated? And so, in the current age, the questions multiply. This is not because knowledge is at an end but because, to repeat, what counts as knowledge takes on multiple formations. Knowledge is not ended but is transformed into multiple knowledges. The forms of knowledge, accordingly, represented by the university, are now challenged.

The university should not feel too disconcerted by all this. Yes, its hold on the world appears to be undermined. Its claims to know are challenged. In the world of the internet, everyone is a potential expert; the academics are no longer granted a status of unalloyed authority; and their frames of knowing are felt to be inadequate for a fast-changing world, replete with its own and proliferating frames for comprehending the world – the rules of which are at least a matter of process as of substance.

Universities, after all, have a strong self-sense of themselves in terms of the knowledge enterprise, as we might term it. But that what counts as knowledge is now being challenged, that there are rival claimants, is a reminder to the university that, ultimately, the production of new frames of knowing is also part of its self-calling. The university is in business not just to provide accounts of the world within accepted paradigms of knowing but also to call in question those paradigms and to offer entirely new ways of understanding the world. That new knowledges are now emerging or being heralded outside the university suggests that the university has neglected its earlier callings towards innovation *and* critique and, in turn, has become too much of an institution, comfortable in its own ways of interpreting its task.

### **Realizing the university in a supercomplex world**

How then, in an age of supercomplexity – which is, as we have noted, an age of multiple knowledges – are we to understand the knowledge mission of the university? If, by definition, knowledge is produced more or less univer-

sally across the knowledge society, what might characterise the knowledge activities of the university?

Another way of posing these questions would be to ask: what is to be distinctive about the epistemology of the university? It is a fair question but, unless treated carefully, can lead to difficulty. For it might tempt the sense that there is available to the university a particular way of coming at the world that is particular to it and that stands alongside the many others. Correspondence of truth claims, action, communication and understanding, pragmatic pay-off: if these are some of the major epistemologies in or entering the university, perhaps there is yet another that we might glimpse that would have particular value in the world. I want to press just such a thesis but in a slightly different way.

If there is no end, at least in theory, to the proliferation of knowledges in the contemporary age, the university cannot stake its epistemological credentials on another form of knowledge as such. What it can do, however, is to offer particular ways of generating and assimilating knowledge. I suggest that there are four dimensions of epistemological life that could, together, serve to legitimate anew the place of the university in this age of supercomplexity.

#### *Revolutionary accounts of the world*

This age of supercomplexity is marked by an abundance of new accounts of the world. New images, new technologies, new texts, new discourses; new forms of professional life: all serve to provide new knowledges. New frames of understanding: this is what an age of supercomplexity call for. Very well: let the university be daring in the accounts that it offers to the world. The university likes to believe that it does just this. But, as Kuhn decisively, if unwittingly, demonstrated a generation ago, the academic community naturally shrinks from producing epistemological revolutions: it would rather restrict itself to a largely endorsing function within existing paradigms (Kuhn 1970).

Turning the university's knowledge production system from an endorsing machine to one that seeks to produce radically new frames of understanding would require considerable changes in the ways in which research is funded, evaluated and managed. Within universities, new reward structures that encouraged creative effort, and the formation of multidisciplinary groupings would be required (out of which inventive problem nets, research programmes and ideas might emerge).

*Critical commentating*

In our explorations here, the appellation ‘knowledge’ has been employed in a largely honorific way. To point to the manifold knowledges proliferating in the modern world – whether knowledges for production or for consumption – is in a sense to concede too much. This sociological usage neglects to ask the evaluative or, even, philosophical question: are these really forms of knowledge? The title of ‘knowledge’ denotes, it might be said, justified true belief (Ayer 1969). All sorts of questions were begged in this classic formulation (under what conditions was a belief justified? What theory of truth was to be invoked? Was the belief personal or social?). Nonetheless, what is contained in this formulation is the continuing sense that there should be some means of evaluating a truth claim (cf. Van Dijk 1998, p. 109). In turn, evaluation calls forth an infrastructure under which intersubjectivity might be established. This is just what is lacking in many of the new pretenders to the status of knowledge. Being pragmatic or action-based in character, or relying on their effects in the world, they lack formal means of scrutiny (Barnett 2000b). They are merely pretenders to the title of knowledge.

A new role for the university opens, therefore; or, to put it slightly differently, the extension of one of its existing roles appears. This is to invoke its self-understanding as a forum for critical thought. In the past, that role has largely been interpreted as forming evaluations *within* forms of thought established by universities, according to their own tests for truth and epistemological procedures (cf. Hirst 1974). Now, however, a new critical function beckons in which the university turns to scrutinise the new knowledges and evaluate them as such. This need not be a purely negative in laying out their coercive role (cf. Foucault 1979); on the contrary, it could be tantamount to describing the new pragmatic knowledges, such as to lay bare their structure and to provide a more informed understanding of them. Calling the new societal knowledges to account in this way would, at the same time, extend the university’s critical function so as to help to bring what is otherwise a ‘runaway world’ under some semblance of critical control.

*A therapeutic epistemology*

In an age of supercomplexity, in an age of radical uncertainty, the key educational challenge is not one of knowledge as such. It is that of *being* (to invoke a Heideggerian term). If knowledges are proliferating, if any account of the world is contestable from all manner of directions, if our sense of who we are and our relationships to each other and to the world are insecure (as they all are), *being* overtakes knowledge as the key epistemological concept. That is to say, instead of looking for rules of description (cf. Bernstein

1996), we should look instead for rules of assimilation. Translated into educational terms, pedagogies are required that provide the capacities for coping with supercomplexity; which encourage the formation of human being that maintains a purposive equilibrium in the face of radical uncertainty and contestability.

Such a pedagogy is therapeutic in character. It deals directly with the student's experience and her human being as such. It allows for the discharge of repressed claims on the world (Marcuse 1965; Giddens 1991). It makes possible a life-world becoming (Barnett 1994) that is normally denied in media and institutions that are themselves saturated with proliferating frames of meaning. It offers rooms for personal engagement and negotiation with those frames of meaning.

Supercomplexity dislocates the self: a therapeutic pedagogy offers, if fleetingly, the restoration of an identity between self and meanings. It does so by allowing space for meanings to come from within the person. A therapeutic pedagogy offers a chance of recovering the self. It looks back to that which was suppressed but also looks forward to new realizations of human being.<sup>1</sup>

#### *A pedagogy for critical action*

By itself, a therapeutic pedagogy would leave individuals as voyeurs of supercomplexity: they would be at ease with it, having developed the psychological and ego structures that afford a resilience to it. But that's it. A fourth educational mission, therefore, opens up for the university in such an age, that of enabling individuals to act purposively in an environment where all bets are off, where everything is uncertain and where everything is challengeable.

It is under this heading that the university will wish to couple to itself some of the action-based epistemologies now proliferating in the wider world. And it is doing this. But, unless those action-based epistemologies are tied to the university's other three functions, sheer technicism will result (cf. Barrett 1978). The debate, worldwide, about developing 'skills' among students in higher education runs just this danger, particularly in that model in which the skills in question are to be defined largely by external interest groups. Implanting such skills that neither allow for the possibility of imaginative constructions of new forms of action (function (1) above) nor that open them to critical scrutiny (function (2) above) would not provide the basis for emotional equilibrium (function (3) above). 'Knowledge-in-use' has to be converted into critical action (Barnett 1997), in which students are encouraged to bring to bear their own critical insights. After all, the modern world needs not just 'competent' doctors, but doctors who can interrogate their own

actions within a range of critical perspectives and who are able to envisage entirely new forms of professionalism.

### Conclusion

University knowledge, understood as offering a pure, objective reading of the world, does have to be abandoned. The institutional autonomy upon which such a contemplative conception of knowledge had some basis is no longer available to the university: the university both is incorporated into projects of the state and, amid globalization, is promoting its knowledge services through its own entrepreneurial activities (Clark 1998). But the university is not, thereby, delegitimised (Delanty 1998). In an age of supercomplexity, a new epistemology for the university awaits, one that is open, bold, engaging, accessible, and conscious of its own insecurity. It is an epistemology for living amid uncertainty.

A world of supercomplexity deprives the university of its anchoring in the pursuit of knowledge and truth: no longer can it be assumed that there are relatively clear categories of right knowing or that the university alone could determine their criteria and legitimate forms of realization. However, the idea of university knowledge in such an age is not, thereby, dead. It can be reclaimed provided that the university is prepared to abandon its inbuilt sense of 'knowing' of what counts as truth and knowledge and grasp the epistemological possibilities that unfold in the wake of supercomplexity. What counts as truth and knowledge are open, as knowledges multiply and as frameworks for comprehending the world proliferate. In the end, all we have is proliferating stories of the world but we are not, thereby, bereft of hope (cf. Rorty 1999).

An age of supercomplexity, accordingly, calls for nothing less from the university than *an epistemology for uncertainty*. It has, as we have seen, four elements:

1. The capacity for revolutionary reframing;
2. The capacity for critical interrogation of all claimants for knowledge and understanding;
3. The capacity for enabling individuals to feel at ease in an uncertain world;
4. The capacity for developing powers of critical action.

Such an epistemology abandons metaphysical beliefs in there being identifiable forms of legitimate truth and knowledge that are the particular concern of the university; or of any fundamental truths as such (cf. Rorty 1999). In a world of supercomplexity, there can be no assuredness to the epistemological base of the university. Yet, in reaching out to such a new epistemology, the university – as it turns out – emerges in continuity with its rhetorical past. Its

earlier beliefs in itself as a site of enlightenment, of critical scrutiny, of the open society, and of personal fulfilment: all these are now back on the table. The university can be reborn.

## Note

1. This reflection – on the link between ‘recovery’ and ‘suppression’ – has been prompted by work towards a PhD on the concept of student voice currently in progress by Denise Batchelor at the Institute of Education, University of London.

## References

- Ayer, A.J. (1969). *The Problem of Knowledge*. London: Penguin.
- Barnett, R. (1994). *The Limits of Competence*. Buckingham: Open University Press.
- Barnett, R. (1997). *Higher Education: A Critical Business*. Buckingham: Open University Press.
- Barnett, R. (2000a). *Realizing the University in an Age of Supercomplexity*. Buckingham: Open University Press.
- Barnett, R. (2000b). ‘Working knowledge’, in Garrick, J. and Rhodes, C. (eds), *Understanding Learning at Work*. London: Routledge (in press).
- Barnett, R. and Griffin, A. (eds) (1997). *The End of Knowledge in Higher Education*. London: Cassell.
- Barrett, W. (1978). *The Illusion of Technique*. London: William Kimber.
- Bernstein, B. (1996). *Pedagogy, Symbolic Control and Identity*. London: Taylor and Francis.
- Clark, B. (1998). *Creating Entrepreneurial Universities*. Oxford: Pergamon.
- CVCP and HEFCE (2000). *The Business of Borderless Education: UK Perspectives*. London: CVCP.
- Delanty, G. (1998). ‘The idea of the university in the global era: From knowledge as an end to the end of knowledge?’, *Social Epistemology* 12(1), 3–26.
- Eraut, M. (1994). *Developing Professional Knowledge and Competence*. London: Falmer.
- Foucault, M. (1979). *Discipline and Punish*. Harmondsworth: Penguin.
- Gibbons, M. et al. (1994). *The New Production of Knowledge*. London: Sage.
- Giddens, A. (1991). *Modernity and Self-Identity*. Cambridge: Polity.
- Gokulsing, K. and DaCosta, C. (1997). *University Knowledges as the Goal of University Education*. Lampeter: Edwin Mullen.
- Hirst, P. (1974). *Knowledge and the Curriculum*. London: Routledge.
- Horton, R. (1971). ‘African traditional thought and Western science’, in Young, M.F.D. (ed.), *Knowledge and Control*. London: Collier-Macmillan.
- Kenney-Wallace, G. (2000). ‘Plato.com: The role and impact of corporate universities in the third millenium’, in Scott, P. (ed.), *Higher Education Re-Formed*. London: Falmer.
- Kuhn, T.S. (1970). *The Structure of Scientific Revolutions*. Chicago: Chicago University Press.
- Lyotard, J-F. (1984). *The Postmodern Condition: A Report on Knowledge*. Manchester.
- Marcuse, H. (1965). ‘Repressive tolerance’, in Connerton, P. (ed.), (1978) *Critical Sociology*. Harmondsworth: Penguin.
- NCIHE (1997). *Higher Education in a Learning Society*. Report of National Committed of Inquiry into Higher Education. London: HMSO.

- Nonaka, I., Umenoto, K. and Sasaki, K. (1998). 'Three tales of knowledge-creating companies', in von Krogh, G. et al. (eds.), *Knowing in Firms*. London: Sage.
- Polanyi, M. (1966). *The Tacit Dimension*. New York: Doubleday.
- Polanyi, M. (ed.) (1978). *Personal Knowledge*. London: Routledge and Kegan Paul.
- Readings, B. (1996). *The University in Ruins*. Cambridge, MA: Harvard University Press.
- Rorty, R. (1999). *Philosophy and Social Hope*. Harmondsworth: Penguin.
- Ryle, G. (1949). *The Concept of Mind*. Harmondsworth: Penguin.
- Schon, D. (1983). *The Reflective Practitioner*. New York: Basic Books.
- Slaughter, S. and Leslie, L.L. (1997). *Academic Capitalism*. Baltimore: Johns Hopkins.
- Stehr, N. (1994). *Knowledge Societies*. London: Sage.
- van Dijk, T.A. (1998). *Ideology: a Multidisciplinary Approach*. London: Sage.
- von Krogh, G. et al. (1996). 'An essay in corporate epistemology', in von Krogh, G. and Ross, J. (eds), *Managing Knowledge*. London: Sage.