

Knowledge and Innovation – ‘five easy pieces’

Ralph Tabberer
Chief Executive TTA

Introduction

There is a wealth of research and philosophy - good and bad - about knowledge, knowledge management and knowledge transfer. Much of it raises issues of business strategy, culture, leadership development, and change management which are familiar.

There are, however, a few new ways of looking at things and these may help take thinking further about current school reform efforts in England. Certainly, there are some fresh insights available into change, improvement, collaboration and innovation. There are also a couple of shortcomings to be aware of from the outset. Much of the knowledge literature makes too little effort to translate ideas into practice. Additionally, the literature in general has a fairly weak evidence base and most of what there is lies in the private, business sector. The public services have some differences.

On a practical level, I think the knowledge literature as a whole is first saying to us that most organisations do not manage knowledge particularly well, which is not too clever since we live in a knowledge society and knowledge has never been such an important asset. And the literature is then saying things to us about how to manage knowledge better.

Keeping to this practical theme, examples of knowledge management programmes could include:

- insurance companies building the computer-based systems to back up their shift to telephone- and web-based business
- primary schools introducing formal systems for tackling change, as a means of improving their capacity to absorb new demands
- pharmaceutical companies systematising in detail the process stages through which they develop and patent drugs
- management consultancies sharing project approaches and tools worldwide

- NHS Direct, providing a protocol-based telephone service to people in their homes
- the National Literacy and Numeracy Strategies (NLNS)
- IBM ‘Wired for Learning’, connecting schools who seek to share their innovations

These can be described as knowledge management programmes because the organisations responsible for them have thought about some central business services and processes, managed the knowledge needed to improve the services and processes, and organised that knowledge in a way which makes that body more effective, now and for the future. Information technology often plays a part in the better organisation and management.

An example of work in the field, and its increasing importance, is provided by the following extract from a recruitment advertisement for the Bank of England in the Sunday Times on 15 June, 2003.

Head of Knowledge Management

Developing effective and integrated information intensive services

LONDON c.75,000 + Benefits

- Reporting to the Head of Management Services, the jobholder will be responsible for developing and delivering a change programme to enhance all aspects of the Bank's diverse information management activities. The objective is accessible, secure, and integrated electronic knowledge management for all the bank's information requirements.
- Graduate calibre with at least seven years experience in relevant areas such as large-scale data management, document image processing and workflow.
- Significant record of achievement in leading change programmes and working with users to integrate new information management tools and discipline into everyday working practices, to enable sophisticated enterprise-wide knowledge management.
- This is a pivotal role in moving the Bank towards a highly effective and sustainable information management infrastructure, which maximises the accessibility of accumulated knowledge and information, and will enjoy a commensurate profile in the organisation.

In this short paper, I have set out five ‘organisers’, or ways of thinking, that I have found in the knowledge literature and which, I hope, will add to debate about school reform. Of course, I have greatly simplified a number of issues and I apologise from the start to everybody this will offend – and to the cited authors most of all.

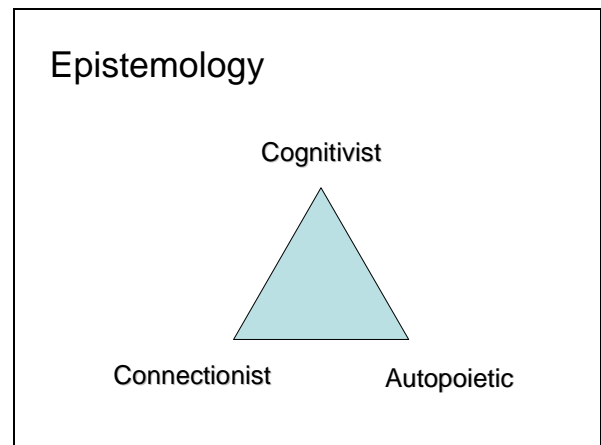
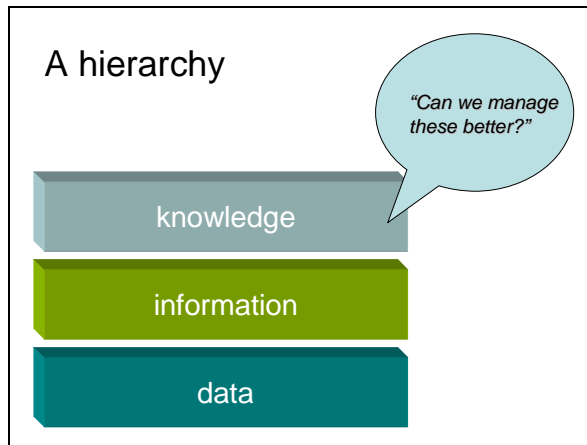
Knowledge and its hierarchy

The first ‘organiser’ is the simplest. It emphasises the need to make organisations not just ‘data rich’ but ‘information rich’ and ‘knowledge rich’ as well.

An organisation might be quite good at organising and using data (e.g. understanding the spread of performance and being able to analyse which departments tend to do worst); it

may even be quite good at managing information (e.g. one part of the organisation knows what others are doing and planning). That does not mean it is good at managing knowledge (i.e. making what people have learned about what works available in a form which others can readily use).

- an *autopoietic* position which emphasises how self-referential organisations are, and which essentially calls upon knowledge management to focus on how an organisation uses knowledge and learns internally (not least because organisations learn badly from without).



At a time when the Department for Education and Skills (DfES) is launching an updated toolkit (the pupil tracker) enabling schools to manipulate school and pupil level data, this is a timely reminder that schools need much more than data to improve.

Data may help them benchmark their performance externally and internally. It may help them pose questions and surface problems. Without managing information, however, they will not know exactly who out in the wider world is doing better, and why. And without managing knowledge, they will not be able to learn effectively about the differences and put what they learn into practice.

It appears to me that there is value in each position. An organisation would do well to codify well what it can, build learning networks and recognise the greater difficulties of importing knowledge from outside. It would do well, in particular, to look at how – through all its internal systems, rules and processes – it moves knowledge around, resides knowledge in people or other repositories, builds knowledge over time, and best exploits the best things it knows.

The most fashionable position recently has been the *autopoietic*, which emerged from a Japanese outlook on companies. Nonaka and Takeuchi (1995)² describe processes whereby people in companies internalise and externalise knowledge, never perfectly. They recommend that organisations concentrate on improving four central processes: socialisation, externalisation, combination and internalisation (SECI).

Knowledge and epistemology

Second, it helps to note that there are different standpoints that can be taken on the nature of knowledge.

Von Krogh and Roos (1995)¹ suggest there are three broad positions:

- a *cognitivist* position which suggests that there are plenty of knowable facts which it is the task of knowledge management to codify and share;
- a *connectionist* position which suggests that knowledge is so socially constructed that knowledge management should focus on creating learning networks; and

The optimum *socialisation* generally occurs in apprenticeship or other student-and-teacher relationships, which are focused on helping people learn from others while they are engaged in physical experiences. Then, *externalisation* is a process of talking or writing about what you know, often using metaphor and analogy to make what you know clearer.

Then, *combination* is the process of making knowledge more systematic. Often, the goal in combination is to create a prototype or working model for the new situation, or product, you want to create. Finally, *internalisation* is the process of building the knowledge into what you

do. For example, to internalise working knowledge, novice engineers might work from video case studies and then 'learn by doing' things which are similar.

For a time, knowledge managers have focused on ensuring that their organisations are strong in the four SECI components.

Knowledge: tacit and explicit

It is time for a third organiser, and it has to be the distinction between tacit and explicit knowledge. It sits at the heart of the SECI model, and others.

It is important that we take into account, especially in education, the distinction between tacit and explicit knowledge. After all, teaching itself is a highly complex activity, its practice commonly involving interaction in classrooms between about 20 to 30 people.

In their efforts to cope and survive, teachers learn to routinise certain behaviours – theirs and their pupils – and it is a striking feature of practical classroom teaching that these routines are often tacit. This makes knowledge transfer about the practice of teaching – and about changes in classroom behaviours – much more difficult to effect. Teachers do not have much of a language with which to describe such complexity.

As an aside, Eraut (2000)³ makes a similar point when he distinguishes between the 'thick' version of knowledge, that enable teachers to do their work, and the 'thin' versions which they use for explaining and justifying what they do. And Von Hippel coined the term 'sticky knowledge' to convey that some forms of knowledge – in particular, knowledge about complex practices – are very hard to transfer from one place to another.

The most important thing about the distinction between tacit and explicit knowledge is that it reminds us that we need to be cautious about how we treat knowledge. It is always tempting to see knowledge just in the *cognitivist* sense - as a rational, and reducible, thing which can be readily moved from A to B. Or to believe that everything can be known. Far from it.

Knowledge and its transfer

Now for the fourth piece. Snowden (2003)⁴ has recently introduced a further way of looking at

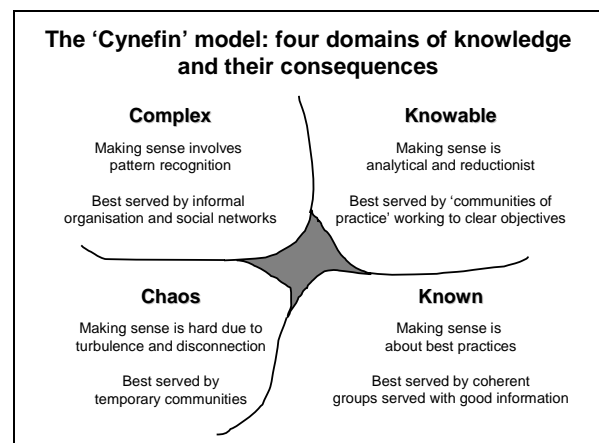
knowledge. His 'Cynefin' (pronounced kun-ev'in) model looks more deeply than the SECI model into the complexity and flow of knowledge. It also thinks more deeply about the ways that people make sense of the world, drawing on their tacit and explicit knowledge.

Essentially, the 'Cynefin' model makes much of the distinction between complicated and complex knowledge.

For example, aircraft systems are complicated, but they can largely be understood. Snowden points out that the SECI model may help organisations to transfer knowledge about such complicated systems because the knowledge is both rationalist and reducible. People can fairly readily internalise and externalise both what is *known* and what is *knowable*.

Human systems, on the other hand, tend to be complex and, consequently, knowledge about them takes a different form. A lot of knowledge is either *complex* or even *chaotic*. Such knowledge is very, very different to deal with.

The Cynefin model therefore tells us that we must understand the nature of the different knowledge used in our organisation, before determining quite the best way to manage its transfer. Different knowledge management systems and team-working approaches will suit different tasks.



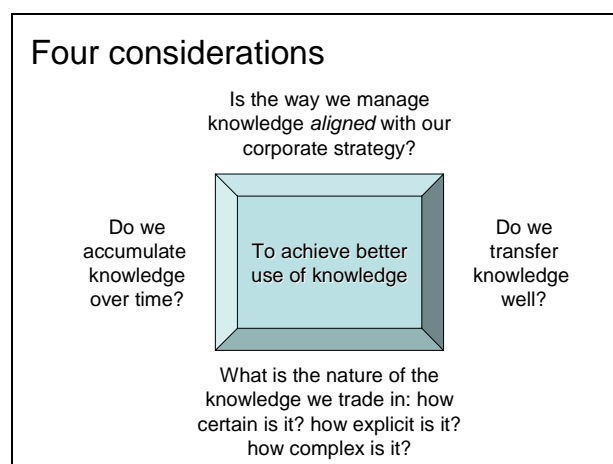
There are some very interesting consequences of using this model. For example, knowledge transfer in complex and chaotic areas may best be served first by disrupting entrained thinking and ingrained processes. It should come as no surprise to learn that the Cynefin approach promotes techniques such as:

- encouraging private collaborations across

- organisations and promoting story-telling between those involved;
- identifying, and clustering, like-minded people in an organisation, who can form the nucleus of a new 'community of practice'; and
- techniques to promote shifts in perspective.

Knowledge: what is to be done?

Now for the fifth and final 'organiser', something to bring us back to earth. I believe the literature encourages us to ask four knowledge management questions about our organisations and the ways we work:



The four questions interact. They are interesting to tackle from the standpoint of the Teacher Training Agency (TTA), the Standards and Effectiveness Unit (SEU) and schools. Only a simple start can be made here, for illustrative purposes. In each case we need to start from key goals.

At TTA, our main goals are: (a) to increase recruitment to the teaching profession, and (b) to make sure that the training that new entrants get is the best we can make it.

The knowledge management we need for the two goals differ. In (a), teacher recruitment, for example, we need to manage the *knowable* process internally of developing our products (routes into teaching) and getting them to the labour market, and the *complex* process of recognising patterns in recruitment during the year so that we can quickly adapt and compete better.

Building data year-on-year, so that we can understand trends, is important but even more is the key process of building problem-solving service teams, well-informed about

past successes and failures, ready to act quickly when things turn against us. Equally important is making this data, information and knowledge available to those inside our training providers who do the actual recruitment. Sometimes we need to disrupt entrained thinking and ingrained behaviour. We can only do that effectively if people take a voluntary part in questioning how they, and we, have worked in the past.

In SEU, a central goal is to raise standards of achievement in primary and secondary schools.

In some areas, notably in primary literacy and numeracy, a great deal is known about what works and, in this area, powerful systems can be built to codify and present that knowledge in a readily transferable (*combination*) form – the National Literacy and Numeracy programmes with local- and school-level implementation measures.

In other areas, we perhaps have still to decide what is *knowable* and what is *complex*, or even *chaotic*, so that we can decide what further we should try to codify, and where we should adopt knowledge strategies designed to get schools to learn from experience. And if we decide that much is currently just too *complex* or *chaotic* to handle at the centre, we should still ask searching questions about how we ensure knowledge is transferred within (and with great difficulty, beyond) organisations, and how we accumulate knowledge over time.

In schools, a central goal is to raise pupil achievement, primarily through investing in the knowledge and expertise of the whole school team.

In some *known* areas – for example where there are curriculum plans, schemes of work and common resources – knowledge is increasingly well accumulated and shared. One wonders, from time to time, why more of the knowledge underpinning the curriculum is not codified and available, on demand, to pupils independent of the teaching environment in which most schools are still organised.

In more complex realms of knowledge – especially pedagogy - schools vary hugely in the extent to which they generate, internally, both knowledge and inquiry about how the classroom works. They vary hugely in their success in accumulating that knowledge, and in codifying it over time. They vary hugely in

their capacity to tackle entrained thinking and ingrained behaviour.

These differences will not be resolved by any single programme, from outside, designed to improve innovation, or collaboration, or networks, or knowledge within (and between) schools. It is only by carrying these programmes into the schools, and by challenging the schools themselves to align, accumulate and transfer their knowledge more effectively, that there will be sustainable progress.

Conclusions

I have on occasion wondered why it is that, in England, our strong internship model for initial teacher training has worked so well. After all, it has driven up the quality of initial training markedly in the last four years⁵. Now, I understand a bit better that it enshrines the powerful idea, for novice teachers, of learning complex knowledge through (a) apprenticeship, and (b) reflection. 'Practical theory' works.

Perhaps I also understand, now, why so much in-service education and training – much less focused on learning through apprenticeship and by doing – has proved considerably less effective.

I began this short paper by saying that the knowledge literature contained a mix of good and bad material. Let me conclude by borrowing from one more good article (Ichijo, von Krogh and Nanaka, 1998)⁶, in order to identify 'enablers' of good knowledge management in any organisation:

- Create a knowledge intent – a desire to improve what is known, and how that is shared, across an organisation
- Develop organisation conversations – encourage employees to have work-oriented, face-to-face conversations
- Develop organisational structure which facilitates knowledge development – and organisational structure where there is any measure of complexity needs to produce variety in information sources, in perspectives and therefore in the ways information is interpreted
- Manage care relationships – good knowledge transfer needs independent, all-out commitment to the subject of concern

and the emotional culture of an organisation will greatly influence its knowledge effectiveness

- Develop knowledge managers – using incentives, job rotation and 'on-the-job' techniques to build capacity and take care to spread people, and their influence, around the organisation to ensure that all parts use knowledge well

If you do all these, you will have the mindset, communication, structure, relationship and Human Resource management you need to manage knowledge effectively. The trick, though, is to do all because – as ever - it is in the combination of many actions that deep-seated change comes about.

References

- ¹ Von KROGH, G. and ROOS, J. (1995). *Organisational Epistemology*. New York: Macmillan and St Martin's Press.
- ² NONAKA, I. and TAKEUCHI, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford: Oxford University Press.
- ³ ERAUT, M. (2000). Non-formal learning and tacit knowledge in professional work, *British Journal of Educational Psychology*, 70, 113-36.
- ⁴ SNOWDEN, D. (2003). Complex acts of knowing: paradox and descriptive self-awareness. *Special Edition Journal of Knowledge Management*, volume 6, number 2 (May).
- ⁵ OFSTED (due, June 2003). *Reports on the inspection of primary and secondary initial teacher training between 1998 and 2002*. London: OFSTED.
- ⁶ ICHIJIO, K., Von KROGH, G. and NONAKA, I. 'Knowledge enablers'. In: Von KROGH, G., ROOS, J. and KLEINE, D. (1998). *Knowing in Firms*. London: Sage.