Developing Learning Networks

John Bessant and George Tsekouras

Centre for Research in Innovation Management, University of Brighton, Brighton, UK

Abstract: Considerable interest has been shown in models of inter-organisational collaboration including clusters, networks and recently supply chains. Arguably effective configurations of enterprises can work together to achieve some form of what is termed 'collective efficiency' which enables them to cope with the challenges of the current competitive environment. This paper addresses one aspect of such collective efficiency: the potential acceleration and improvement of the process of knowledge acquisition and capacity building through shared learning. It explores the concept of formal 'learning networks' and reports on UK research into the design and operation of such networks.

Keywords: Clusters: Innovation; Inter-organisational networks; Knowledge management; Learning networks; Supply chain management

1. Introduction

Inter-organisational networking is becoming an issue of considerable interest amongst researchers, policy-makers and practitioners. In part this reflects the perception of advantages of networking over traditional transactional models of organisation, in which there is often a trade-off between modes of interaction (Williamson, 1975), and in part it acknowledges the impact of technological and market changes which have blurred the boundaries between enterprises and opened up the arena in which new forms might emerge. 'Virtual enterprises', 'boundaryless organisations' and 'networked companies' are typical examples of the thinking and experimentation which is going on to try and establish different approaches to the problem of inter-organisational relationships.

Unfortunately, as Nohria and Eccles point out, the increasing interest in the phenomenon has meant that the term 'networking' has become imprecise but there is, nonetheless, some convergence of thinking on the topic (Nohria and Eccles, 1992; Grandori and Soda, 1995).

In this paper we are concerned less with networks as a theoretical construct than with looking at them in terms of their effective operation. It is clear that some form

of inter-organisational cooperation can contribute benefits to members under certain conditions; of particular interest here is work on supply chains and networks, innovation networks (Tidd, 1997; Oliver and Blakeborough, 1998) and industrial districts (Chaston, 1995; Semlinger, 1995; Schmitz, 1997). For example, in the case of supply chains and networks there is extensive evidence to support the view that some form of cooperation represents a viable alternative to more traditional confrontational models – although the design and implementation of such cooperative arrangements remain fraught with difficulty (Macbeth, 1989; Sako, 1992; Lamming, 1993).

Similarly there has been much discussion about the merits of technological collaboration, especially in the context of complex product systems development (Dodgson, 1991; Hobday, 1994; Marceau, 1994). Innovation networks of this kind offer significant advantages in terms of assembling different knowledge sets and reducing the time and costs of development, but are again often difficult to implement (Tidd, 1997).

Studies of 'collective efficiency' have explored the phenomenon of clustering in a number of different contexts (Piore and Sabel, 1982; Humphrey and Schmitz, 1996; Nadvi, 1997; Porter, 1997). From this work it is clear that the model is widespread – not just confined to parts of Italy, Spain and Germany but diffused around the world – and under certain conditions extremely effective. For example, one town (Salkot) in Pakistan plays a dominant role in the world market for specialist surgical instruments made of stainless steel. From a core group of 300 small firms, supported by 1500 even smaller suppliers, 90% of production (1996) was exported and took a 20% share of the world market, second only to Germany. In another case the Sinos valley in Brazil contains around 500 small-firm manufacturers of specialist high-quality leather shoes. Between 1970 and 1990 their share of the world market rose from 0.3% to 12.5% and they now export some 70% of total production. In each case the gains are seen as resulting from close interdependence in a cooperative network.

The conditions under which effective networking takes place are less clearly identified, but it is becoming clear that simple factors such as proximity do not, of themselves, explain the complexities of networking. For example, Humphrey et al. identify the importance of developing trust relations, whilst Schmitz and Best stress the importance of facilitation by network brokers, *impannatore* or others (Best, 1990; Nadvi and Schmitz, 1994; Schmitz, 1995; Humphrey and Schmitz, 1996). This paper seeks to add to this literature by exploring enabling and constraining mechanisms associated with effective learning in networks.

2. Purposive Networks

In all of these cases it appears that networks form for particular purposes, but then offer the possibility of additional activity taking place based on the core cooperative framework. Thus, for example, the clusters of middle Italy may have originally formed as an economic response, providing a way of resolving the basic difficulties of resource access for small firms. But having established a core framework which allowed for resource sharing and collective efficiency, these networks began to grow, adding a dimension of technological learning to them. The case of CITER in Italy is a good example here. The predominantly small scale of firm operations in

the fashion textile sector meant that none could afford the design technology or undertake research into process development in areas like dyeing. A cooperative research centre – CITER – was established and funded by members of the *consorzia* and chartered with work on technological problems related to the direct needs of the members. Over time this has evolved into a world-class research institute but its roots are still in the local network of textile firms. It has become a powerful mechanism for innovation and technology transfer and has helped to upgrade the overall knowledge base of this sector (Rush et al., 1996, 1997).

Our concern in this paper is to look at one aspect of network behaviour – the potential value of learning together – and to explore the emerging concept of 'learning networks' as examples of networks specifically established for the primary purpose of increasing the knowledge base and capacity of a group of members.

3. Learning Matters …

To state the obvious, firms need to learn to survive. As de Geus points out (based on studies carried out by Shell), the average corporate survival rate for large companies is only about half as long as that of a human being (de Geus, 1996). To put this into perspective, almost 40% of the firms which made up the *Fortune* top 500 10 years ago no longer exist, while of the top 12 companies which made up the Dow–Jones index in 1900 only one – General Electric – survives today. Even apparently robust giants like IBM, GM and Kodak can suddenly display worrying signs of mortality, while for small firms the picture is often considerably worse since they lack the protection of a large resource base.

Behind these figures lies a challenge. Not all firms fail and some have undoubtedly thrived during this period; the key feature which they share is an ability to adapt and learn to deal with their rapidly changing and uncertain environments. Research suggests that there are two important components involved in such learning: the first involves the accumulation and development of a core knowledge base – the 'core competence' – which differentiates the firm from others and offers the potential for competitive advantage. Acquiring this is not simply a matter of purchasing or trading knowledge assets but the systematic and purposive learning and construction of a knowledge base (Pavitt, 1990; Kay, 1993; Prahalad and Hamel, 1994; Tidd et al., 1997; Teece, 1998).

The second component is the long-term development of a capability for learning and continuous improvement across the whole organisation. Recognition of this need has led to growing emphasis on the concept of 'learning organisations' and on the mechanisms through which this capability can be developed (Senge, 1990; Nonaka, 1991; Garvin, 1993; Leonard-Barton, 1995). One aspect is the possibility of gaining traction and support for the learning process through working with others in what we term 'learning networks'.

4. How Organisations Learn

There is much discussion of learning in organisations, and the following represents a brief attempt to summarise some convergent themes:

- There is some agreement that learning can be viewed as a cyclical process (see Fig. 1), involving a combination of experience, reflection, concept formation and experimentation (Kolb and Fry, 1975).
- It follows from this model that learning only takes place when the cycle is completed – thus much effort and activity in one or more quadrants may not necessarily lead to learning.
- We also need to recognise that learning is not automatic – there must be motivation to enter the cycle, and if there is insufficient arousal learning may not take place.
- Learning can be supported by structures, procedures, etc. to facilitate the operation of the learning cycle – for example, through challenging reflection, facilitated sharing of experiences or planned experimentation.
- Learning involves the accumulation and connection of data into information and knowledge.
- Learning involves both tacit and formal components, with the task being to capture and codify, to make explicit (Polanyi, 1967; Nonaka, 1991).
- Learning may take place in 'adaptive' mode – learning to do what we do a little better – or it may involve reframing and radical change (what some writers term a 'paradigm shift') in which the perception of the problems to be solved and the potential set of solutions change (Kuhn, 1962; Argyris and Schon, 1970; Bessant, 1998).
- Learning to learn – learning to design and operate learning systems – is an important attribute of the development of learning organisations (Argyris and Schon, 1970).

Most of the original work on learning was carried out at the level of the individual but in recent years there has been growing interest in the concept of 'learning organisations'. At one level it can be argued that it is only the individuals within an organisation who can learn but at another there is some evidence for viewing organisations as capable of learning behaviour which extends beyond that of individuals and which emulates key activities like experimentation, association and remembering (Hedberg, 1981). In particular we can make the following observations about learning organisations:
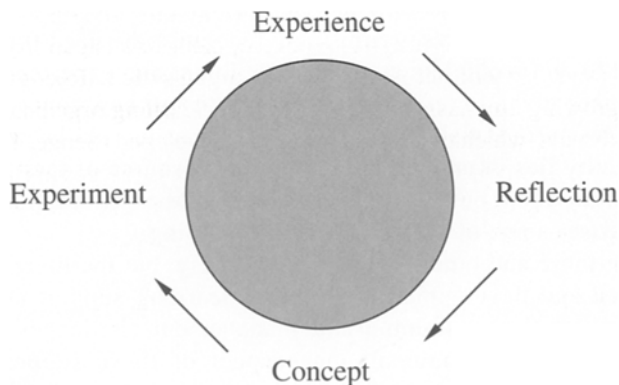

Fig. 1. Kolb's cycle of experiential learning.

- First, while it is individuals who carry out learning processes, it is the organisation which provides the context in which this takes place – and some environments are more conducive than others to enabling learning.

- Second, under certain organisational conditions individuals interact and share knowledge. Over time this can become part of the organisational culture – the pattern of shared concepts, values, beliefs, etc. (Schein, 1992); where this culture is sufficiently strong it can survive the departure of individuals and the entry of new individuals who become socialised into it. Thus we can speak of an organisation learning, and having some form of memory where its learning accumulates and which guides its subsequent behaviour.

- Although much learning takes place in the tacit domain, attempts can also be made to capture and formalise knowledge learned in this process. For example, formal programmes of directed experiment and reflection (R&D) can lead to increased codified and tacit knowledge – the technological competence of the firm. Equally programmes which attempt to capture tacit knowledge in exemplified procedures also contribute to making tacit knowledge explicit – e.g. in the articulation of core processes, which underpins the acquisition of ISO 9000 certification.

- Several mechanisms appear to help with this process of sharing and making knowledge explicit; these include exchange of perspectives, shared experimentation, display, measurements, etc. (Garvin, 1993). At their heart they represent ways of supporting and developing a shared learning cycle.

5. Problems with Learning

Although there is growing interest in the topic and strong arguments for the need to acquire and upgrade knowledge on a continuing basis – continuous learning – the fact remains that learning is a complex and problematic activity. It does not take place automatically – indeed in many cases there are elaborate defence mechanisms which militate against the organisation even entering the learning cycle. These range from ignorance and isolation from stimuli, through to various forms of denial or of underestimating the strength of the incoming stimulus (Tidd et al., 1997). In other cases firms may recognise the need for learning but become locked in an incomplete cycle of experiment and experience, with little or no time or space given to reflection or to the entry of new concepts. For some the difficulty lies in organising and mobilising learning skills, while in other cases the difficulty lies in making use of the rich resource of tacit knowledge – things people know about but are unable to describe or articulate (Polanyi, 1967). Table 1 summarises some of the key blocks to learning.

Dealing with these and other problems is not easy, but the literature suggests that the creation and development of relevant learning support structures and processes is one of the most important management challenges emerging in the new competitive environment. One aspect of these support structures concerns the use of principles of shared and cooperative learning to help maintain momentum.

Table 1. Key blocks to learning

Learning block	Underlying problem
Lack of entry to the learning cycle	Perceived stimulus for change is too weak Firms is isolated or insulated from stimulus Stimulus is misinterpreted or underrated Denial
Incomplete learning cycle	Motivation to learn is present but process of learning is flawed. Emphasis given to some aspects – e.g. experimentation – but not to all stages and to sequence
Weak links in the cycle	Reflection process is unstructured or unchallenging Lack of access to or awareness of relevant new concepts Risk avoidance leads to lack of experimentation Lack of sharing or exchange of relevant experiences – parochial search for new ideas 'Not invented here' effect
Lack of learning skills or structure	Lack of supporting and enabling structures and procedures
Knowledge remains in tacit form	Lack of mechanisms for capturing and codifying learning
Repeated learning	Lack of mechanisms for capturing and codifying learning leads to repetition of same learning content
Learning is infrequent, sporadic and not sustained	Mechanisms for enabling learning are not embedded or absent

6. Intra- and Inter-Organisational Learning: Can Networks Help?

Although much of the discussion on learning organisations is concerned with structures and processes within particular firms, there is an emerging strand which deals with the theme of inter-firm learning. For example, in work on supply chain development there is a growing recognition that the next step after moving from confrontational to cooperative relationships within supply chains is to engage in a process of shared development and learning (Hines, 1994; Kaplinsky et al., 1999).

   This aspect of learning has something in common with the principles of learning within groups instead of at the individual level. In particular the active participation of others in the process of challenge and support is recognised as a powerful enabling resource and was developed into a widely used approach termed 'action learning' (McGill and Warner Weil, 1989). This concept stresses the value of experiential learning and the benefits which can come from gaining different forms of support from others in moving around the learning cycle. Part of the vision of Revans, one of the pioneers of the concept, involved the idea of 'comrades in adversity', working together to tackle complex and open-ended problems (Revans, 1983; Pedler et al., 1991).

   The potential benefits of shared learning include the following:

• In shared learning there is the potential for challenge and structured critical reflection from different perspectives.

- Different perspectives can bring in new concepts (or old concepts which are new to the learner).
- Shared experimentation can reduce perceived and actual cost risks in trying new things.
- Shared experiences can provide support and open new lines of inquiry or exploration.
- Shared learning helps explicate the system's principles, seeing the patterns – separating 'the wood from the trees'.
- Shared learning provides an environment for surfacing assumptions and exploring mental models outside of the normal experience of individual organisations – helps prevent 'not invented here' and other effects.

Arguably this approach has much to offer inter-organisational learning, and the experience of regional clusters of small firms provides one important piece of evidence in support of this. The ability of textile or ceramic producers to share knowledge about product and process technology and to extend the capabilities of the sector as a whole is recognised as central to their abilities to achieve export competitiveness. In the case of Italian furniture, for example, a dominant position in world trade has been achieved and sustained over 15 years – yet the average firm size is fewer than 20 employees (Piore and Sabel, 1982; Best, 1990).

If we accept that there is potential in the concept of learning in networks or clusters, two questions are raised. The first is the extent to which we can consciously build in this concept in the design and operation of 'managed networks' – such as supply chains or technological collaborations. The second is the extent to which it can be used as an alternative or complementary model for enabling learning around a specific theme – for example, technology transfer, upgrading and competence development amongst small firms.

7. Building Networks that Learn

Networks of any kind offer many opportunities for learning to take place – by sharing ideas, trying out experiments, etc. But where such learning takes place it is essentially as a 'by-product' of some other activity or purpose within the network. However, it might be possible to use the network concept as a vehicle whose *primary* purpose is to enable learning. This concept of a 'learning network' can be expressed as

'a network formally set up for the primary purpose of increasing knowledge'

This definition implies a number of features:

- They are formally established and defined.
- They have a primary learning target – some specific learning/knowledge which the network is going to enable.
- They have a structure for operation, with boundaries defining participation.
- Processes which can be mapped on to the learning cycle.
- Measurement of learning outcomes which feeds back to operation of the network
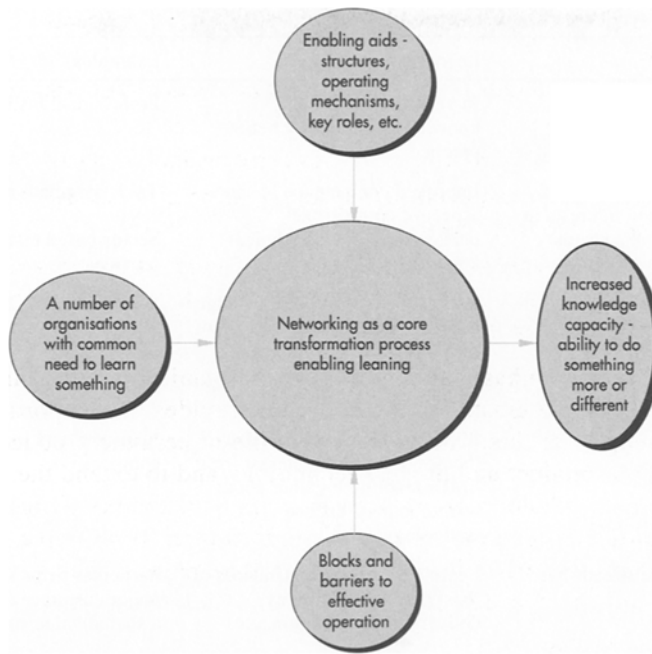
Fig. 2. Key elements in learning networks.

and which eventually decides whether or not to continue with the formal arrangement.

These features may be weakly or strongly developed in different kinds of learning network, but they represent structure and process aspects which could be explored further. We can express this diagrammatically as in Fig. 2.

8. An Emergent Typology of Learning Networks

Examples of the kind of learning network described above might include:

- a formal club whose members have formed together to try and understand and share experiences about new production concepts – e.g. a 'best practice' club or forum;
- a shared pre-competitive R&D project – 'co-laboratories';
- a supplier association where the aim is to upgrade levels of capability;
- a professional institution where the aim is to upgrade and update members' knowledge;
- a trade or sectoral research organisation where the aim is to upgrade sectoral knowledge.

Such groupings represent the coming together of groups or individuals for particular learning purposes; Table 2 indicates an outline typology for networks of this kind.

Table 2. Outline typology of learning networks

Type	Learning target	Examples
Professional	Increased professional knowledge and skill = better practice	Professional institution
Sector-based – association of firms with common interests in the development of a sector	Improved competence in some aspect of competitive performance – e.g. technical knowledge	Trade association Sector-based research organisation
Topic-based	Improved awareness/knowledge of a particular field – e.g. a new technology or technique in which many firms have an interest	'Best practice' clubs
Region-based	Improved knowledge around themes of regional interest – e.g. SMEs learning together about how to export, diffuse technology	'Clusters' and local learning cooperatives
Supplier- or value stream-based	Learning to achieve standards of 'best practice' in quality, delivery, cost reduction, etc.	Particular firms supplying to a major customer or members of a shared value stream
Government-promoted networks	National or regional initiatives to provide upgrades in capacity – knowledge about technology, exporting, marketing, etc.	Regional development agencies, extension services, etc.
Task support networks	Similar to professional networks, aimed at sharing and developing knowledge about how to do a particular – especially novel – task	Practitioner networks

It is important to note that many of these – for example, professional institutions – represent learning networks, but also carry out other activities such as representation and lobbying on behalf of their members. In many cases the learning aspects become subordinated or even dormant; we can compare between different examples of the same kind of learning network. Thus some trade associations are perceived as more active facilitators of learning for their members than others.

Several networks are also hybrids – for example, it is possible to find examples of networks which are both government promoted and also topic based. Some are formally promoted, with a clear focus and organising 'hub', while others are largely cooperative and based on mainly informal mechanisms. For example, many emergent practitioner networks are essentially 'self-help' networks of people in a new role for which the operating rules are still unclear; it makes sense for them to pool experiences and develop the emergent role together.

Although there is wide variety, the primary feature of such learning networks is that they all use the principle of shared learning to enable capacity development. Therefore it will be worth looking at how learning networks can contribute to this generic process.

9. Learning Networks in Operation

Our interest in learning networks forms part of a wider project looking at inter-organisational networking (ION). Within this programme we are looking at a generic framework for reviewing the operation of effective networks, which is based on the model in Fig. 2, presented earlier. Essentially this views a network as a form of organisation in which a number of activities and processes help it fulfil its purpose. In particular we are concerned with eight core processes and the extent to which these are carried out as being linked to the success or otherwise of the network. The eight core processes are shown in Table 3.

The basic ION model asserts that networks will be more or less effective in the ways in which they handle these processes. For example, a network with no clear routes for resolving conflicts is likely to be less effective than one which has a clear and accepted set of norms – a 'network culture' – which can handle the inevitable conflicts that emerge.

Building and operating networks can be facilitated by a variety of enabling inputs – for example, the use of advanced information and communications technologies may have a marked impact on the effectiveness with which information processing takes place. Independent facilitation appears to have a strong influence on many of the behavioural dimensions.

In order to explore some of these issues further we carried out some exploratory research on a number of learning networks during 1998/9. Table 4 gives their details.

In each case interviews were held, covering the following broad set of issues:

- background – history, membership patterns and arrangements, target membership, etc.;
- structure – number and typology of members, organisation and management, finances, etc.;
- operation – key activities, recruitment and maintenance work, etc.;

Table 3. Eight core processes in inter-organisational networking

Process	Underlying questions
Network creation	How the membership of the network is defined and maintained
Decision making	How (where, when, who, etc.) decisions get taken
Conflict resolution	How (and if) conflicts are resolved
Information processing	How information flows and is managed
Knowledge capture	How knowledge is articulated and captured to be available for the whole network
Motivation/commitment	How members are motivated to join/remain in the network – e.g. through active facilitation, shared concerns for development
Risk/benefit sharing	How the risks and benefits are shared
Integration	How relationships are built and maintained between individual representatives in the network

- key success factors;
- key blocks to development.

10. Key Themes Emerging

Although not representative of the range of potential learning networks, this sample does cover most of the typology mentioned earlier and allows us to examine some emerging issues. In particular it is clear that while all share the basic set of operating processes, the ways in which these are addressed vary considerably. Analysis suggests that there are several influencing variables which have a bearing on both the design and operation of such networks, and these will be discussed briefly below.

10.1 'Design' Variables

Under this heading we consider those factors which need to be considered when setting up a learning network, and these include the following:

Table 4. Examples of learning networks

Example	Type of learning network	Primary purpose
A business innovation centre and 14 small firms in its region	Region/topic-based	Enhancing manufacturing capability amongst SMEs in the region
NASURF – the National Surface Engineering Centre	Government-promoted/ topic-based	Enabling technology transfer to SMEs in the surface finishing field
Industry Forum (organised by the Society of Motor Manufacturers and Traders)	Sector-based	Enabling upgrading of manufacturing and supply performance within the automotive components sector, especially in 2nd and 3rd tiers
A textile manufacturer's network co-ordinated by a regional university	Sector-based	Enhancing product and process innovation
Construction Productivity Network (organised by the Construction Industries Research Association)	Sector-based	Improving productivity across SMEs in the construction sector
SALIGNA Consortium	Value stream/supply network-based	Promoting export competitiveness within the value stream of eucalyptus furniture production
CIRCA Network	Topic-based	Promoting experience sharing in implementation and maintenance of continuous improvement practices
The Specialist Counsellors Network (involving innovation and technology counsellors and the design counsellors attached to business links in the UK)	Practitioner-based	Sharing experience and emerging good practice around small firm support

• Purpose – what is the main learning target for which the network is being set up? Here the issue is one of clarity; if the network is set up as a loose affiliation of organisations with a general but rather vague perception of the need to improve some aspect of their operations, the resulting network will lack focus. Conversely, a clearly defined and shared sense of purpose with a focused and measurable learning target is likely to be more viable.

• Participants – who are the members of the network going to be, and what is the basis of membership? Although learning networks are essentially 'open' in character, there is a value in defining boundaries, particularly in terms of providing focus and coherence. One commonly used mechanism is to establish the network as some form of members' club (often with a nominal subscription base) in which participation brings a set of services (such as workshops, consultancy and newsletters). The purpose here is less one of income generation than of securing a commitment on the part of members to participate.

• Structure – is it a 'moderated' network with a coordinating hub or a radial network, diffusing information from the centre, or a member-to-member wheel model? A number of different models exist for learning networks and much appears to depend upon the type of learning involved. For networks where the primary issue is to communicate formal knowledge – for example, to diffuse awareness of new legal requirements or building regulations – a simple radial model in which information flows one way from centre to periphery would be suitable. However, in the case where the learning target is concerned with tacit knowledge acquisition – for example, mastering a new technique – a model which stresses high levels of two-way interaction may be more appropriate.

• It is also important to identify and define roles within the network, particularly those of coordinator and facilitator. Networking as a process may not happen without some assistance, both in terms of arranging relevant mechanisms (running workshops, editing newsletters, etc.) and also in energising and motivating learning and in enabling effective interchange of experience to take place. It is also important to consider what arrangements are made for identifying and training network brokers, coordinators and facilitators. The importance of these roles, particularly in helping networks with more advanced forms of learning, is considerable but the skills involved may not be familiar and there may be a need to provide support – perhaps even a second learning network – for network brokers etc. to acquire and develop relevant skills and expertise.

• Type of learning to be transacted – is it primarily information diffusion or more concerned with tacit knowledge exchange? Here the concern is with clarifying the nature of the learning likely to be involved, and we need to recognise that learning can take place in several ways (Holti and Whittle, 1998). At its simplest it might involve the acquisition and absorption of straightforward factual data which is available in explicit and codified form – for example, a new set of regulations on pollution control or emission standards. Then there is learning in relatively simple adaptive fashion – learning to do what we do a little better; an example here would be mastering a particular production process which is already explicit in terms of the information about it and evident in practice elsewhere so that there are reference sites and demonstration visit possibilities. At higher

levels learning may require challenging assumptions and reframing the problem issues to be addressed – for example, in learning new manufacturing philosophies like 'total quality management' which involve a culture change – i.e. a rethink of fundamental assumptions and beliefs. This reframing requires very different approaches to simple information or adaptive learning – and so there are implications about the design and operation of a suitable network to enable this.

• Content of learning – how will the learning be diffused? Assuming that there is a clear focus to what needs to be learned, there is then the need to look at delivery. To take an educational analogy, what is the 'syllabus' and how will it be broken up into manageable chunks? It is often helpful here to have some kind of reference framework – for example, in work on learning to manage software projects more effectively some learning networks make use of the Capability–Maturity Index developed by Carnegie Mellon University (Paulk et al., 1993). Some quality clubs make use of the European Foundation for Quality Management model as a means of guiding the learning involved in quality improvement. In the case of the Industry Forum example various benchmarking tools are used to help focus the learning process.

• Mechanisms to be used – how will the different stages of the learning cycle be addressed? What combination of experience sharing, structured reflection, introduction of new concepts and shared experimentation will be used? How will these be mobilised in a programme of activities?

• Pump-priming activities to motivate organisations to join – for example, public subsidy, benchmarking, awareness raising campaigns.

10.2 Operating Variables

Under operational variables we need to consider how the network will actually operate and the ways in which it can be 'fine tuned' to improve its performance on a continuing basis. Factors here include:

• Coordination and facilitation – evidence from our cases and a number of studies of learning networks suggests that formal inputs to help energise and coordinate their operation are critical factors. The role of 'network broker' is complex but requires a combination of energy and enthusiasm, credibility within the community in which the network is located and an ability to facilitate the *process* of networking rather than engage in 'expert' consultancy. In other words the broker needs to avoid telling people what they should do and instead should help them articulate their learning needs and the various routes across the network which might enable them to meet those needs.

• Measurement framework – what will 'success' constitute and how will it be measured? Internal measures – such as number of members, turnover of members, renewals of subscriptions, etc.? External measures such as improved performance directly attributable to increased knowledge capacity?

• Operating arrangements – an important part of the maintenance and continuous improvement activity associated with managing a learning network is concerned with reviewing the mechanisms whereby learning can take place. This involves

both selection from and addition to the range of options – workshops, visits, seminars, newsletters, briefings, etc. – and also development within each of these categories – frequency, organisation, location, contents, etc.

• Operating channels – in similar fashion it is important to review how effectively the network is diffusing knowledge and enabling learning. Reviewing the channels in use – face to face meetings, site visits, structured interactions, use of electronic media, etc. – needs to take place on a continuing basis against the range of options and their performance.

• Resources – what resources – people, learning materials, etc. – are available or can be developed to support the network?

• Blocks and barriers – factors which inhibit the successful operation of the network, including lack of motivation to learn, communication difficulties, blocking behaviour by key individuals or groups, entrenched culture of 'we've always done it this way ...', etc.

• Enabling tools and techniques – formal interventions which can help deal with some of these blocks – for example, training, organisational development inputs, facilitation, benchmarking.

10.3 Is it Working? The Contribution of Networks to Improved Learning

At this early stage it is difficult to specify the extent to which learning is being enabled in these networks except at an anecdotal level. Many of these networks are relatively new creations, but there does seem to be growing support for this mode of enabling learning. 'Networking' is recognised as important although it is poorly understood – one of the clear messages emerging from the pilot study is the need to learn more about the range of options which might constitute good practice. A particular problem in this connection is the absence of measurement frameworks against which learning progress can be mapped. There is a risk that without suitable measures to highlight whether and where progress is being made, many efforts to establish such entities will founder.

Most of the studied networks had a clear sense of purpose, and were at least trying to measure their performance by some form of response – for example, membership numbers or inquiries. They had growth targets and some plans for formal development – usually by expanding the range of services and channels whereby they could reach and support members in the learning process. UK networks were aware of experience elsewhere – especially in Italy and Denmark – for example, as a result of the publicity given to strong export performance achieved by small firms in the furniture sector in Italy.

In general these networks represented complementary or additional mechanisms for enabling learning rather than as a replacement for intra-firm activity. As the earlier table indicated, the 'motive power' came from many different sources – for some it was towards a form of 'self-help' group (for example, with many best practice clubs) but with others the network was established largely as an attempt to cope with market failure – for example, the DTI-supported initiatives towards SMEs.

11. Conclusions

Although the research reported here is at an early stage it is becoming clear that there is potential for improving the knowledge base of organisations through participation in some form of learning network. A growing number of studies are looking at specific examples of learning networks and the processes involved in setting them up and operating them, and from this some basic design rules are emerging. In particular they stress the need for a clear statement of purpose – a specific learning objective rather than the general but vague hope that something will be learned through interaction.

Research also stresses the need for formal inputs to the process of design and operating learning networks; they rarely occur by chance and often require inputs, particularly in the form of coordination and facilitation.

Although we have been considering the case of networks specifically established for the purpose of learning, it is clear that learning behaviour can be found in other kinds of network. For example, in collaborative innovation networks, the aim is to work together to create a new product or develop a new process. This necessarily involves active learning within the network and many of the above design rules are relevant. However, innovation networks of this kind differ in some respects; for example, they are much more likely to be closed, only involving those members with a claim on the final intellectual and commercial property and prepared to invest their own risk capital (financial and intellectual). Innovation networks are also likely to be addressing specific *applications* of knowledge rather than its development and diffusion; in this sense open learning networks are more likely to be found in pre-competitive R&D or in academic circles.

In similar fashion, learning is a requirement in the operation of effective supply networks. Learning new ways of working, particularly those which involve enhancing the value stream or eliminating waste within that stream, are a key agenda item in the development of the 'new' forms of supplier/ customer relationships. There is also a major need to change the frame of reference of players within sectors concerning the nature and operation of these relationships, and this culture change will require extensive 'un-learning' of outdated and inappropriate behaviours as well as acquisition of new, more cooperative models based on shared goals and continuous improvement. Thus it is likely that, as these mature, so we will see increasing application of some of the above design rules.

The potential for learning networks seems considerable, given the range of challenges in the environment to which organisations must respond in new ways. But it is also clear that there is still a considerable gap between rhetoric – what could and should be done to build such networks – and the reality of their implementation. Much work needs to be done on understanding the challenges involved in successful operation of learning networks, and the tools with which to facilitate their development and survival.

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Correspondence and offprint requests to: J. Bessant, Centre for Research in Innovation, University of Brighton, Falmer, Brighton BN1 9PH.