Project work as a locus of learning: The journey through practice

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Introduction

The need for learning and innovation is often given as the major reason for firms to deploy projects and project teams as a way of organizing work tasks (Allen, 1996; DeFillippi and Arthur, 1998; Edmonson, 2002). Project work is widely seen as providing an important locus for learning within and between organizations (DeFillippi, 2001), being associated with many of the perceived conditions for learning, including the need to solve new problems, relative autonomy, and (in cross-functional teams particularly) diversity of perspectives. This approach to organizing work is thus seen as particularly useful in contexts typified by rapid changes in markets and technologies (Allen, 1996). Following this logic, organizations in both service and technology-based sectors are increasingly structuring work around projects and project teams (Zenger, 2002; Huber, 1999). The perception that project work is fertile ground for learning, however, is counterbalanced by other studies which highlight the difficulty which organizations experience in attempting to learn from projects. While many organizations make conscious efforts to ‘capture’ the learning from projects (for example, via post-project reviews), the available evidence suggests that these efforts are rarely successful (Hobday, 2000).

This paper aims to explore the potential and limitations of such efforts to translate project-based learning into organizational learning. It builds on previous work in this field which has suggested that the practice-based view of knowledge and learning may provide a new, more powerful lens for studying these issues. Many previous studies of project-based learning have adopted a broadly cognitive approach to the topic. This approach highlights the ability of project members to reflect on their experiences and identify appropriate lessons for the wider organization. In contrast, a practice-based approach sees learning as intertwined with the practices of particular social groups and communities. This suggests that the objectified view of knowledge implicit in attempts to capture and transfer learning may be a significant constraint on their effectiveness, helping to explain the limited degree of success noted above.

While considerations such as these argue for a practice-based view of project work, developing such a view involves moving beyond some of the existing literature which tends to
depict projects and communities of practice as largely unrelated phenomena. In contrast, this paper will outline the interplay between project work, communities and practices in enabling or constraining organizational learning. This interplay arises from the respective roles which projects and communities of practice play within particular organizational contexts. This varies, for instance, according to the centrality of project work to the performance of organizational tasks (where we can contrast project-based with functionally structured organizations). In addition to these structural influences, however, the focus of this paper highlights the need to view both learning within and from projects as an ingredient in the dynamic reproduction and transformation of practices within the organization, and the influence which projects and communities of practice exert upon that dynamic. These issues are explored empirically through case studies of 3 different projects, each of which highlights the variability in organizations’ ability to derive value from project-based learning according to the positioning and consequences of the project for the wider organizational context.

In the next section we summarise different explanations of project-based learning to date. We then detail the contribution of practice-based theorising and the community of practice (CoP) concept for the analysis of project-based learning. This draws attention to discontinuities between project practices and organizational practices that may constrain learning. This is followed by an empirical analysis of project-based learning from which we identify patterns linking learning within projects to learning from projects, across distinctive organizational contexts.

**Perspectives on project-based learning**

Projects can be seen as the activities clustered around specified work tasks where there has been an allocation of resources and roles (e.g. a project manager) by a sponsoring organization to that task (de Fillippi, 2001). Whereas the traditional view of projects saw them as rarely-to-be-repeated, time-bound, goal driven activities (e.g. constructing a new, one-off building) with limited opportunities for learning, more recent research has recognised the importance of projects as sites for learning. Existing research on learning in project settings, however, usually focuses, either on learning within project teams (e.g. studies of individual learning within team (Arthur et al. 2001; Huber 1999; Marks and Lockyer 2004; Sense 2003)), or on learning from projects to the wider organization (e.g. studies of post-project reviews, project management and ‘lessons learnt’ (Courtright 2004; Schindler and Eppler 2003; Williams 2003)). Relatively little research focuses on the processes linking learning within projects to learning in the organization (Edmondson, 2002). This reflects a more general tendency for theories of organizational learning to address, discretely, micro individual-level or macro organizational-level issues (Hardy et al, 2003). Yet, if organizational learning derives from the localised learning that occurs through project work, then it is important to develop
meso-level theory to explain how learning within projects and project teams becomes translated (or not) into learning from projects to other parts of the organization (Rousseau and House, 1994; Edmondson). Project-based learning is thus defined here as encompassing learning within projects (intra-project learning) and also learning from projects to other projects (inter-project learning) and to the wider organization (Scarborough et al, 2004; Kotnour, 2000).

As noted earlier, the dominant perspective on project-based learning to date has been broadly cognitive in character. This cognitive perspective highlights changes in individual cognition, including perceptions, attitudes and behaviour, as the characteristic form of learning within organizations. In this perspective, project-based learning occurs through such cognitive changes. In summary, this perspective views such learning as involving the operation of multiple mechanisms which impact on and reflect cognition. These include; the eliciting of existing knowledge though team member expertise and their social networks (Ancona and Caldwell 1992); transforming such knowledge through a range of activities including the integration of disparate forms of expertise (Okhuysen and Eisenhardt 2002), reflection on and articulation of experience (Zollo and Winter, 2002: Ayas and Zeniuk, 2001), and the conversion of tacit into explicit knowledge (Nonaka and Takeuchi 1995); and, finally, the diffusion of the knowledge created, ‘embrained' in the heads of project team members (Blackler 1995; Huber 1999) as they move on to new roles or projects within the organization, or to be made available as ‘lessons learned’ or ‘after-project reviews’ (Kotnour, 1999) stored on company intranets or databases (Sharp, 2003).

But, while studies adopting this cognitive view are generally optimistic about the possibilities of project-based learning being shared with the wider organization, existing empirical evidence is much more mixed. For example, the available evidence suggests that post-project review activities are not very successful in spreading knowledge to other groups (Von Zedtwitz, 2002; Keegan and Turner, 2001). Coming from sites where explicit attempts were being made to ‘capture’ the learning from projects, this evidence reinforces a number of other studies which have indicated limited or no success with such initiatives. Our own previous work has suggested that some of the reasons for organizations’ apparent inability to learn from projects may have have to do not with the mechanisms applied to creating, storing and diffusing knowledge – which is in large measure the prognosis of cognitively-oriented studies – but rather with the relationship between project and organizational context. It was suggested in our previous work (Scarborough et al. 2004), that the study of practice – and particularly divisions in practice – might be an important ingredient in that relationship.

The practice focus sharpens a distinction between learning and knowledge creation or acquisition which is sometimes blurred in cognitively-oriented studies that view learning simply as the assimilation of knowledge (Lave and Wenger 1991). Thus a number of practice-based studies highlight a distinction between ‘knowledge' and ‘knowing' (Cook and Brown 1999;
In this view, the ‘ways of knowing’ of the project team may allow them to use knowledge as a tool (Cook and Brown 1999) or produce knowledge as an output (Suchman, 2001). However, changes in such ‘knowing’ are linked to changes in practice and are not simply a question of creating or acquiring new knowledge. This suggests a view of project-based learning as involving changes in practice, and the spread of those changes across the wider organization. Although the embodiment of knowledge in artefacts and the representation of knowledge in systems may provide tools for such changes – in the form, for example, of ‘boundary objects’ such as process templates – the usefulness of such tools seems to depend on the existing divisions in practice within the organization (Newell et al. 2003). This is not to suggest that learning cannot take place through other mechanisms. However, with our focus on learning within organizations, and set against the backdrop of limited success for cognitive approaches, it seems that the practice lens may be an appropriate means of viewing both the potential and the limitations of project-based learning.

**Developing the practice-based view of project work**

One possible response to the differences between the relative stability of communities of practice and the relative discontinuity of project work, is to concede that the learning within projects is not amenable to a practice-based view. This would, however, risk viewing projects as a ‘lonely’ phenomenon (Engwall 2002), disconnected from their organizational context. The alternative response, and one which we pursue in the remainder of this paper, is to see the interplay between projects and communities of practice as a topic for exploration. This involves undertaking a careful analysis of the relationship between project activities and existing organizational practices, and identifying its implications for the development and transfer of knowledge and learning.

In broad terms then, our challenge in this paper is to develop an approach to project based learning that sees projects not as vehicles for the creation and diffusion of knowledge but as a locus of learning which is both shaped by and impacts upon the existing practices of the organization. This approach is supported by the emergence of the practice-based perspective on the creation and sharing of knowledge within and between organizations. This perspective, which has highlighted the intimate relationships between knowledge (or knowing), work practices and social relations at workplace level, makes an important contribution to our understanding of the way in which organizations learn. Gherardi, for example, argues that ‘learning is…an inseparable and integral part of all organizational practices’ (Gherardi, 2001). Thus organizational learning is seen as grounded in, and arising from, the highly localised, interpersonal and variegated practices of organizational members who work together in subgroups and teams (Edmondson, 2002). This means that locus of learning lies not with a reified, monolithic organization, but rather with the pluralistic practices of subgroups and teams
within the organization. The prevalence of organizing around project work means that projects now act as major sites for social interaction and group work. Therefore it follows that, in understanding how organizational learning develops, it is important also to understand how learning occurs (or fails to occur) in work that is organized around projects.

Within the existing literature, work on the role of learning in social practices has generally focussed on the development of communities of practice. The latter involve ‘a set of relations among persons, activity and world, over time and in relation with other tangential and overlapping communities of practice’ (Lave and Wenger, 1991: 41), and are seen as emerging over time through the recursive practices and social interactions of established social groups (Lave and Wenger, 1991). The contribution of such communities to organizational learning was originally highlighted by Brown and Duguid (1991) who identified the role of story-telling in the sharing of non-canonical practice amongst a particular work community. In contrast, projects are generally seen as involving highly time-bounded social interaction, various and discrete forms of activity, formal objectives and one-off tasks (Wenger et al., 2001). Project activities tend to be less repetitive, and are often loosely coupled to multiple organizational contexts (e.g. through subcontracting or supply chain relations – e.g. Bresnen, 1990; Morris, 1994; Sydow and Staber, 2002). They typically lack the community-building effects (e.g. through strong ties, continued participation, common identities) found in localized, ongoing and more routine work activities (Gherardi et al, 1998).

Moreover, at first glance the description of learning in communities of practice seems less relevant to the learning which takes place in projects. Lave and Wenger, for instance, describe learning in terms of ‘legitimate peripheral participation’. Learning is seen as involving a charge in the individual and is related to their socialization and identity formation within a particular community. As they put it, ‘one way to think of learning is as the historical production, transformation, and change of persons’ (p.51). Again, these processes – of long-term participation and apprenticeship - are not generally associated with projects, where the more usual image is one of disparate groups of individuals being assembled and dis-assembled in relation to specific tasks. Lindkvist, for example, suggests that ‘collectivity’ – i.e. a constellation of groups and individuals who temporarily share insights in order to achieve particular objectives – is a better descriptor of project work than ‘community’, which brings with it connotations of team working, shared understandings and identity constructed and negotiated over time.

The perceived differences between project work and communities of practice as highlighted by the existing literature are briefly outlined in Table 1 below.
Table 1: Comparison of the characteristics of CoPs and projects

<table>
<thead>
<tr>
<th>Community of practice</th>
<th>Project work</th>
</tr>
</thead>
<tbody>
<tr>
<td>No formally specified tasks</td>
<td>Predefined task</td>
</tr>
<tr>
<td>Open-ended work cycle</td>
<td>Time bounded</td>
</tr>
<tr>
<td>Emergent community participation</td>
<td>Conscripted participation</td>
</tr>
<tr>
<td>Primary identities forged within the community</td>
<td>Primary identities forged externally</td>
</tr>
<tr>
<td>Social motivation</td>
<td>Intrinsic and extrinsic motivation</td>
</tr>
</tbody>
</table>

(Based on Wenger, 1998: Sense, 2003)

These differences beg the question of how project-based organizations in particular are able to develop specialized knowledge when project membership seems to provide little of the learning outcomes associated with communities of practice. Indeed, some writers argue that project-based organizations exemplify a wider trend towards ‘projectification’ in society which affirms individual agency while casualising employment conditions – effectively transferring the risks of enterprise onto project members (Ekingsmyth 2002). Existing work in this field suggests that some organizations are able to square this circle because they are situated within (and exploitative of) industrial, geographically-centred ecologies which provide the missing community dimension of learning. Thus, in industries such as magazine publishing, advertising, and movies, the project in effect creates the interface between the organization and the wider communities of its environment.

While the link between projects and communities of practice has been studied at the industrial and regional level, less attention has been paid to their co-evolution within organizations. Significantly, the role of the wider industrial communities in the sectors described above is centred on the creation and sharing of aesthetic forms of knowledge and sensibility – forms of knowledge which enable community learning outside the workplace (for example, through sociability, and widely available artefacts). Indeed, this community learning may be much more important than organizational learning in certain sectors. In other sectors, however, for
reasons of task or technology-specificity, critical forms of learning may evolve primarily within organizational boundaries, and it is to this domain that we now turn.

Projects and communities of practice within the organizational context

Our focus on the interplay of projects, practices and learning highlights the dynamic nature of organizational and social forms, warranting a relational rather than an absolute distinction between our key constructs. Thus, for the purposes of this paper we see the concept of community of practice as denoting not a discrete social grouping but rather historically specific expressions of the self-reinforcing relationships between learning, identity, group formation and social practices. This definition not only admits of the wide variety of CoPs found empirically, but allows us to see communities of practice as an emergent phenomenon, overlapping with and not displacing existing sociological categories such as work-group, occupation and profession. Thus, in empirical terms for example, we might identify CoP elements within a range of professional groups – these are described as ‘networks of practice’ by Brown and Duguid. By the same token, CoPs are equally amenable to the kinds of analysis applied to these other groupings, including the role of power relations in constituting and sustaining them (Contu and Willmott 2000).

Project work is also highly diverse in the forms it takes empirically. Again, specifying project work in terms of a given social group is problematic as project work is undertaken by a variety of groups and individuals, inside and outside the focal organization, not all of whom are members of an identified project team (the latter being in many cases a highly fluid formation) A suitably inclusive definition here, therefore, would present such work as centring on the shifting relationship between organizational tasks, group coordination and resource allocation. Importantly, this definition suggests that projects may be differentiated from CoPs politically, inasmuch as their formal representation in the management structure and the resource dependencies which they command may make them significant political actors within the organization – some writers highlight the power of ‘heavyweight’ project managers, for example. In contrast, CoPs are less likely to mobilize as political actors but do operate as sites of resistance to such actors.

CoPs within an organizational context

As described above, some previous work has highlighted the relationship between projects and communities of practice in terms of the wider industry ecology within which project members are socialized (Grabher 2002). Our focus in this paper, however, highlights the role of the immediate organizational context as both a mediator and an outcome of that
relationship. Some important considerations arise from this focus as far as CoPs are concerned. First, when we adopt an organization-level perspective, the relationship between communities of practice and projects cannot be framed simply in terms of the supply of suitably skilled and socialized individuals. Rather, the emergence of CoPs may be linked, for example, to the establishment of a new organizational sub-unit or specialism. Should the tasks of that sub-unit be delivered primarily through projects, the resulting homology between project practices and organizational practices may be highly conducive to CoP formation. This kind of outcome is documented in a recent paper by Thompson who described the development of a CoP within the ‘E-Futures’ sub-unit of a large multinational (Thompson 2005).

Secondly, however, since organizations typically encompass multiple communities of practice (being a ‘community of communities’ as Brown and Duguid (1991) put it), the CoP impact on projects may have as much to do with the divisions of practice which they create and solidify as in the forms of learning which they sustain within the organization. Viewing the effect of CoPs in these terms suggests that they may have ambivalent effects on projects as sites for learning. On the one hand, divisions of practice (e.g. across functional specialisations) may create boundaries to the acquisition and sharing of knowledge. As Brown and Duguid (2001) note; ‘it is at divisions of practice were knowledge sticks’. Since project practices are typically seen as discontinuous from the practices, this might help to explain why it is difficult to transfer learning from projects to the organization. However, divisions of practice also create significant opportunities for new learning within projects as members work to overcome practice boundaries in the accomplishment of tasks. For example, Carlile’s (2002) study of cross-functional product design teams observed the significant opportunities for learning and innovation entailed by the effort of team members in overcoming, what he refers to as ‘knowledge boundaries’ – or boundaries to learning created by specialised practice. Carlile suggests that the need to overcome such boundaries is related to the degree of task novelty and interdependency experienced by project members.

Projects within an organizational context

From the existing literature, it is possible to extract a number of factors which may mediate or reflect the relationship between projects and their organizational context. Three factors, in particular, are highlighted by previous studies in this area: project autonomy; project team membership; and organization structure. Thus project autonomy is seen as important for success by a number of writers. Studies in the biotechnology sector show how the innovative potential of projects is directly related to their relative detachment from mainstream organisational structures and processes (Oliver and Liebeskind, 1998; Powell et al, 1996). Such findings suggest that the relative autonomy which projects enjoy, and hence their ability to generate learning, is important in allowing a set of practices to develop (for example, highly
pressurised and time-bounded (Lindkvist et al., 1998; Schultze, 2000)) which are
distinctively different to mainstream organizational practices. Similarly, project
team membership is also highlighted in the literature as important to learning within projects.
Diversity of team member backgrounds is seen as particularly conducive to learning when it
produces tensions between the different cultures or worldviews. Such tensions are said to
‘ignite processes of deeper mutual (self) understanding and reflection.’ (Grabher, 2002: 253).

In relation to project team membership, it is important to note first that our emphasis on the
project as a locus of learning is to depart from much of the existing literature which focusses
more narrowly on the project team membership as such a site (e.g. Senge, 1990; Osterman,
1994; Edmondson, 1996; Edmondson, 1999; Argote et al, 2000). As noted, above, whilst
clearly there is overlap - many projects are carried out by project teams – the characteristics of
projects are not necessarily the same as the characteristics of teams. Psychological definitions
of a ‘team’ emphasise characteristics of shared identity and continued psychological
commitment to team membership where behaviour within the team is shaped by mutual
interests and group-level norms. In contrast, project work is often very temporary, fluid,
interrupted and distributed. Whilst projects typically entail formal role responsibilities, goals and
deliverables - they usually have a project manager and deadlines, for example - the
boundaries of membership and role identities (i.e.who belongs to ‘the team’) are often not that
clearly defined and/or not all that apparent to members of the project. For example, projects in
construction typically involve site managers and construction engineers working alongside an
extended range of other engineers, tendering experts, planners, and external subcontractors
and architects. Different individuals (and organizations) enter and leave the project at different
points in time, depending on particular issues that arise and project members are often
working on several projects at once. As such, the individuals involved may, or may not, see
themselves as part of a (psychological) team and group goals and mutual interests may or
may not develop.

The structural perspective on project work is highlighted in a number of different studies.
These suggest a continuum of organizational forms with one extreme being settings where
projects are organized infrequently to deal with specific needs and challenges – for example,
change programs. At the other extreme, writers have identified the ‘project-based organization’
– one which delivers its primary products and services through project working. Whilst there is
a growing amount of work on this structural form, there is also considerable debate about
whether ‘pure’ forms of such organization exist and, if they do, whether they are sustainable
(see Foss, 2003; Zenger, 2002; Bresnen et al, 2004). Both Zenger (2002) and Foss (2003), for
example, argue that hybrid organizations are inherently unstable and tend to drift towards
more internally coherent bureaucratic or market based forms. Organizations using cross-
functional teams, for example, often continue to use hierarchically-based incentive systems
and, so, drift towards more bureaucratic forms of control (Zenger, 2002; Barker, 1992).
Regardless of whether ideal or 'pure' types of project-based form exist, however, it is evident that many organizations that routinely deploy projects to complete tasks are not 'pure' project-based organizations. More typically, they will display some kind of internal 'hybrid' or matrix management structure which combines project work with work organized around functional or divisional specialization, thus mixing elements of both market and hierarchical governance (Zenger, 2002). Within these matrix forms, some organizations (i.e. project-based) will privilege the project dimension whilst others will privilege the functional/divisional dimension (Lindkvist, 2003; Knight, 1977; Bresnen, 1990).

What do these existing studies have to tell us about the relationship between project activities and practices in the wider organization? Taking the issue of project autonomy first, it may be that autonomy is important for learning precisely because it enables greater distancing from existing organizational practices, thus allowing new practices to emerge which are distinctively different to mainstream organizational practices. One important ingredient in such distancing are the differences in time horizons which many writers see as a quintessential feature of project work, as compared to more routine organizational tasks (Bryman et al. 1987). Whereas organizational tasks are relatively open-ended and continuous, project work is both time-pressured and time-paced (Lindkvist et al, 1998). Even where projects are relatively long in duration (as, for example, with automotive design projects), they typically comprise multiple phased subprojects or ‘gateways’, each with their own time-driven goals, milestones and and deadlines. This has significant implications for learning. On the one hand, the emphasis on milestones and deadlines trigger constant dialogue and compromise among project members between what is sufficient – or ‘good enough’ – and what is optimal to achieve performance. For example, ‘corner cutting', ongoing problem solving, and improvisation is a 'normal' feature of project work. Deadlines, therefore, may induce project members, faced with non-negotiable goals, to abandon established organizational practices in favour of new, performative practices (Lindkvist, 1998; Gersick, 1995).

The limitations of the teamworking perspective on project membership tend to underline the value of a focus on practice rather than team dynamics or diversity per se. Where project membership is driven by established routines of project management, it seems more likely that existing practices will be applied to project work, and less likely that new practices will be developed. Diversity of membership in such settings may simply entail the application of a wide range of existing practices - as in complex, but routine construction projects, involving the programmatic deployment of different specialist skills. Conversely, where project membership is more stable or evolves according to the particular needs of the project itself, the diversity of membership may be an important ingredient in encouraging the development of new practices. It may operate in this way, partly because such diversity creates new challenges for knowledge
integration (Okhuysen and Eisenhardt 2002) which cannot be addressed by existing practices, and partly due to the time-boundedness of projects which ‘prevents any single perspective from becoming corrupted by a hegemonic view…deadlines provide antidotes against lock-ins into particular cognitive or aesthetic patterns.’ (Grabher 249)

Finally, the structural view can be re-interpreted in practice terms as encompassing several aspects of the relationship between project work and the organizational context. For example, structure reflects the relative scope of organizational and project practices. If the project is the organization, for example, many of the above-noted issues are moot: project-based learning is organizational learning. This may be particularly important in smaller organizations. More generally, structure can be seen as a reflection of the distributed nature of practice (Tsoukas 1996). In this view, the organization is constituted by the nature of the practices that it encompasses and by the division between those practices – divisions which are a defining feature of structure. Some writers, for example, view the organization’s raison d’etre as the integration of activities across divisions of practice (Grant 1996).

To summarise the points above, the implications of the different factors outlined – project autonomy, membership and structural setting – for learning can be viewed to a large extent in terms of their effects on the relationship between project activities, existing communities of practice, and divisions between practices. Thus, whether project activities involve the application of existing practices or the development of new practices has important implications for learning within projects, and this is likely to be linked to project autonomy and diversity of membership. In addition, even where projects see very little change in existing practices, they may have a learning effect through the development of new ways of integrating existing practices.

**Implications for project-based learning**

As noted earlier, the implications which these factors have for project-based learning as a locus of learning can usefully be considered in terms of both learning within, and learning from projects.

*Learning within projects*

As noted above, the influence which CoPs exert upon learning within projects depends to a large extent on the positioning of projects within the wider organizational context. Where the project is subsumed with a particular CoP, project learning actually equates with learning by the community of practice. However, even where projects span multiple CoPs, those communities may continue to influence the learning within the project by the importation of
CoP artifacts and stories. Sense (2003), for example, suggests that project teams can become a ‘dumping ground’ for CoP artifacts. This particularly applies where project working is focussed on low novelty tasks. In some project-based organizations, for example, specialist occupational practices may be applied across a variety of projects through the application of organizational routines for the coordination of project work. Where the organization possesses specialist project management capabilities, the interactions between project members may be tightly regulated according to predetermined routines. There may be little or no need to create new forms of coordination when work is programmed and coordinated according to well-established norms and roles. Grant (1996), for example, describes the ‘closely coordinated working arrangements’ of work teams where ‘each team member applies his or her specialist knowledge but where the patterns of interaction appear automatic ’ (p. 379). And even in projects where the task is novel and involves the creation of new knowledge – as, for instance, in R&D projects – the project may not require the development of new practices at project level when existing specialist practices provide the necessary means of knowledge creation.

On the other hand, where task novelty or project membership diversity create discontinuities, project settings may provide opportunities for the development of new practices through the process of interaction amongst project members. This may include a new repertoire of routines, words, tools, ways of doing things, stories, gestures, symbols, actions which have become part of its practice (Wenger 1998). Brown & Duguid for example, in describing one such group note how; ‘…in getting the job done, the people involved ignored divisions of rank and role to forge a single group around their shared task, with overlapping knowledge, relatively blurred boundaries, and a common working identity.’ (Brown and Duguid 2000: 127).

Clearly, this kind of project may provide an arena – more limited in learning scope and time than a CoP admittedly – in which individual learning is supplemented by the emergence of a group affiliation and social motivation (Sense, 2003).

New project practices may also emerge where projects provide a boundary space which enables new forms of coordination and collaboration across existing practices. Such boundary spaces may involve the development of networking and brokering practices. Gherardi & Nicolini, for example, describe practices that ‘that traverse the boundaries of several communities …which.. create a network of relations within a constellation of practices tied together by interconnected practices.’ (p.419).

Learning from projects

Whereas the cognitive approach outlined earlier highlights the role of reflection and codification in spreading project learning throughout the wider organization, the practice-based analysis outlined above implies a rather different account of organizational learning. Such learning
make take a variety of forms, including the creation of artifacts and of stories, and its spread across the organization can be analysed in terms of the development of new practices within the organization and changes in the existing division of practice.

Once again, however, the ability of projects to generate organizational learning is mediated by existing practices and the communities which sustain them. Here Carlile’s work (2002) suggests that the spread of learning from projects may encounter a variety of different ‘knowledge boundaries’ according to the relative dependencies it generates. In an analysis of knowledge flows in cross-functional settings, Carlile identifies three, related, types of knowledge boundary which are seen as arising from divisions in practice. These are: a syntactic (language) boundary, where the flow of knowledge is inhibited by the lack of a common syntax between the individuals or groups involved; a semantic (meaning) boundary, where relevant groups are unable to share knowledge because they bring different interpretations to it; and a pragmatic (practice) boundary, where the flow of knowledge is constrained by differences in the practices and interests of groups and individuals.

Case-studies

The following cases are drawn from a wider study – the initial findings of which have been presented elsewhere (Scarbrough et al., 2004). These cases have been selected for their theoretical contribution more than empirical representation, since they present relatively stylized examples of project-based learning, illustrating the effects of gross variation in tasks and contexts (Pettigrew et al. 2001). Our aim in outlining these cases is simply to illustrate and explore the issues outlined above, and to derive some tentative findings for the wider appreciation of this topic.

Case A: The Thurrock Project at BuildCo

BuildCo is one of largest building contractors in the UK, employing 1200 staff full-time and many others on a contract basis. Its business is organised into three operating divisions (building, civil engineering and process engineering), each regionally and sector focused. Its turnover in 2002 was £370m (£160m building work, £150m civil engineering, £40m of marine/water and the rest in small projects and heavy plant provision). This case focuses on a particular building programme - the construction of a logistics warehouse - carried out by the Midland regional division of BuildCo.
Logistics warehouses are considered routine in BuildCo - the market leaders in this segment - being described as “bread and butter jobs” (Site Manager). As with the majority of Midlands region’s building business, the Thurrock project was developed as a ‘fast track’ design and build programme, where BuildCo’s value engineering capabilities were applied to provide complete solutions that met the need of both developers and end users. The Thurrock project started in February 2002 and was completed in July 2002. Importantly, the warehouse was to be built on a contaminated brown site, as opposed to a green site where most design and build projects were done. This created significant contingencies, including the need to deal with the risk of contamination and with a large concrete slab, which remained after the demolition of previous buildings. As such, an important part of this project involved the development on site of a ‘ground solution’ that would address both problems.

The design and delivery of the overall Thurrock project depended, in practice, on two distinctive project teams - a tender team and a site team. The tender team was concerned with winning the work and agreeing the project specification and price (the tender) with the client. The site team was responsible for the construction of the building to agreed specifications. This way of organizing project practices (i.e. around sub teams dealing with different project phases) was seen as typical of the way projects were approached in BuildCo, so the practices and forms of collaboration described below can be seen as reflecting institutionalized arrangements within the organization.

The tender team comprised staff who were all based at the regional headquarters. These staff were drawn from a variety of specialisms (including planning, architecture, commercial and design) but each specialist also worked on several other projects at the same time. The tender team developed tenders on the basis of their understandings of the building process. Their work practices drew heavily on personal experience rather than any systematic review of previous projects; ‘You tend to go on your own experience and make your own decisions to stand by them.’ (Commercial Manager, tender team). This reliance on personal experience was justified in terms of the belief that ‘no two projects are ever the same’ (Planning Manager, tender team). As a result, tendering was viewed almost as a craft activity; ‘Each job is dealt with separately, individually…We like to start off with a blank sheet of paper.’ (Planning Manager, tender team). The site team was similarly made up of a grouping of technical specialists, including a design and build coordinator, quantity surveyor, engineer, general supervisor and a secretary. This group was led by the site agent, who was effectively the project manager and who, in contrast to the tender team, deployed a number of standardised project management tools and methods used in previous projects.

As was the norm in BuildCo, there was little overlap in the work practices and responsibilities of the tender project team and the site project team in the development of the Thurrock programme and little interaction among members across the two teams. Although there was a
formal handover of responsibilities from one team to the other, this was described as “almost ritualistic” and involved little substantive exchange or collaboration. Moreover, the strict division of labour was not mitigated by any common membership or by a sense of shared identity across the teams – each team operated to its own sets of work parameters, objectives and targets. Unusually for BuildCo projects, the site agent was involved in the tendering process in this case. However, despite this he did not seek to influence key decisions on timescale and design. The demarcation between tender and site project team practices thus sustained two different views of the practices surrounding construction. As the site agent noted (referring to the tender team): ‘They hand over their strategy on how they see things, but the actual job, once that is handed over it has obviously got a different team looking at it. We are the guys that actually are going to build it so we look at it and see what areas we can improve or see where the risks are and we look to see how we can manage those risks out.’

On the face of it, the Thurrock project was successful on at least two counts. First, it was completed four weeks short of deadline - the tender team had planned for a 26-week project but the building was actually delivered in 22 weeks. Second, the site team were successful in developing a ground solution that was more effective than the one originally proposed by the tender team. However, as DeFillipi and Arthur note (DeFillippi and Arthur 1998), project success can sometimes be a ‘false success’, inasmuch as it is not based on genuine performance improvement.

In this case, the completion of the work within the programme does not seem to have been based on learning across the two project teams involved in the overall project. The reduction in timescale was effectively the result of a revision to the original tender by the site team made at the outset of site work. As the site agent put it: ‘We were lucky to get a 26 week programme, so we knew we could shave off at least two or three weeks anyway.’ Thus the programme of work was revised according to the site team’s knowledge from prior projects of proven methods and work practices in construction - knowledge which was not available to the tender team who devised the original programme. The issues of ground contamination and associated ground conditions were also considered during the tendering process and a solution proposed, which involved ripping up the concrete slab and importing fill material to stabilise the ground. However, the site team came to the view that the tender team’s proposed solution lacked an appreciation of the potential implications for the delivery of the project, and so they implemented a different solution.

These instances, arguably, denote, not success, but a failure to translate learning between tender team and site team. This is not to say that no significant learning took place. However, any such learning seems to have been experienced primarily at the individual level, as specialist staff reflected on the implications of tender or site contingencies for their own practices. Little knowledge was circulated from one project team to another, except insofar as
this was pursued and identified by individuals. As a design and build coordinator noted: ‘You do your own job and you know how your job has gone. You hardly hear about anybody else’s job except via the grapevine. On the next job if you work for somebody that was on that job, you will say ‘how was that job’ and you will get to know but it is all very informal.’

This lack of systematic and collective learning was linked to the ‘craft’ or ‘expert’ orientation, which individuals developed towards their work practices. Thus a site engineer highlighted the importance of individual expertise as follows: ‘If it is a minor problem I tend to fix it on the spot and that will be done and it will be locked away in my head. If it is anything a little bit major you would stay on the site team but probably go to the consultants and things like that and get information back from them. Anything else you tend to do it yourself.’ A related feature of this highly individualized approach to learning was the extent to which projects were seen as competitive environments in which individual performance was judged for career progression. This reinforced a particular view of the learning acquired from projects, expressed most candidly by the Site Agent: ‘The thing for me is obviously the more experience I gain obviously the better innovations that I can come up with ….It tends to be that the person who will benefit most out of it is me.’

The problems of lack of learning at project team level appeared to be fairly pervasive in BuildCo. By way of evidence, several managerial initiatives had been launched in the past to overcome these problems and to promote and exploit project-based learning. These included the creation of a new role of ‘Regional Engineering Manager’ where the explicit remit was to ‘spread learning’ across projects. They also included provision for formal ‘post-project reviews’ and ‘quality alerts’. Such initiatives were largely ineffective, however, in stimulating project teams to identify, codify and share the learning from their work. Indeed, post project reviews rarely occurred and quality alerts were applied mainly in a tokenistic way to satisfy managerial requirements. Where learning did develop at a team level, this seems to have centred on the emergence of a certain amount of ‘knowledge redundancy’ (Nonaka, 1994) whereby project team members had come to a better understanding of their respective roles, through working together on a series of projects over time. This enabled them to achieve greater efficiency in the coordination of their specialist activities.

Taken together, these points suggest that the scope of learning within and between project teams in the Thurrock case was highly influenced by the project’s position within a wider portfolio of projects undertaken by BuildCo. This seems to have been important in two ways. First, individuals came to the Thurrock project teams with experience of a number of previous, and similarly designed, projects behind them. Second, as part of a stream of ‘repeat’ projects, the overall Thurrock project was subject to a pervasive focus by management on efficiency through the application of standard methods. Even a Regional Engineering Manager
conceded; ‘it is not about developing new knowledge in the form of non-standard knowledge but about the knowledge needed to standardise.’

One further consequence of these efficiency objectives seems to have been the emergence of a ‘learning by exception’ norm, whereby, as Keegan and Turner (2001) note in their study of construction and engineering firms ‘the focus is clearly on capturing ‘deviations’” (p. 90). Thus in the Thurrock case, where learning did occur, it was usually associated with errors or mistakes. As the Planning Manager on the tender team commented: ‘I suppose it is human nature that we learn from mistakes. But we have not necessarily learnt from the good things. So if we have a major problem everybody knows about it, but we may be doing something really superbly well and have some new idea and we don’t necessarily spread the word. We say bad news travels fast and good news never.’

Case B: Midlands hospital– NHS Trust

Midlands NHS Trust Hospital is one of a large number of trusts that together make up the National Health System of the UK. As mentioned in the introduction, the NHS has been under intense government pressure to improve efficiency. One of the areas targeted by the government as in need of change is the cataract diagnosis and treatment procedure. Cataract surgery, which is a 20-minute procedure, represents 96% of the ophthalmology workload. In most NHS trusts, including the Midlands NHS Trust Hospital before the implementation of the process improvement project described below, cataract diagnosis and treatment involves a patient in a number of visits to various specialists. Typically, patients begin at the optometrist (the high street optician) because they believe that deteriorating eye-sight suggests they need new glasses/contact lenses. However, the optometrist diagnoses that the problem is actually cataracts, and then refers the patient to his or her general practitioner (GP). After a visit to the local GP who, not being an eye specialist generally relies on the diagnosis of the optometrist, the patient is forwarded to the hospital consultant for further examination. The patient then goes on a waiting list and is eventually called for a brief meeting with the consultant, who usually confirms the optometrist's diagnosis, and, in a separate appointment, meets with the hospital nurse for a physical examination. Only when all of these visits are complete will the patient get in the queue for obtaining a date for the cataract surgery. In many trusts, lead-time for cataract surgery is over 12 months. Post-surgery, another visit to the consultant is scheduled to check on the patient and then the patient is referred back to the optometrist for a new pair of glasses. Therefore, it takes patients at least six visits and often well over a year to have a routine, 20-minute, outpatient, surgical procedure.

Given the complexity and long-drawn out nature of this existing process, a new reengineered cataract diagnostic and treatment process was seen as potentially beneficial. To facilitate that
change, a designated member of the hospital’s transformation team\(^1\) was assigned to help to change the process. The transformation team member gathered a team of eye experts from both the hospital and the community to discuss ways in which to cut surgery lead times and improve patient satisfaction. Members of the cataract team included the head nurse in the eye unit, a hospital administrator, general practitioners, a set of optometrists from the local community, and a surgical consultant who was instrumental in championing the need for change and in leading the reengineering effort. Team meetings were held in the evening to facilitate attendance, and were led by the transformation team member. Minutes, flow charts and other necessary documentation for the process, were produced by the transformation team member, and distributed to all team members after each meeting. In total, approximately five project-team meetings were held over a six-month period.

A number of substantive changes to the existing process were made. Non-essential visits to the general practitioner; the consultant and the nurse were eliminated. Instead, optometrists were empowered to decide if a patient needed cataract surgery. In doing so, they are required to fill out a detailed form that provides the consultant with specific information about the nature and severity of the cataract, and to call the hospital and book a time for the patient’s surgery. For their additional responsibility, the optometrists are given some extra training and receive a small amount of compensation from the trust. The preliminary pre-operation physical was replaced with a self-diagnostic questionnaire that each patient is required to fill out and return to the hospital before surgery. Nurses telephone each patient before surgery to check the patient’s details and answer any questions. Post-operation consultant appointments were also replaced with follow-up telephone calls.

The new cataract procedure resulted in dramatic efficiency gains. Lead times were radically reduced from over 12 months down to six to eight weeks. In addition, theatre utilization rates have improved due to the addition of an administrator whose sole responsibility is scheduling theatres. Finally, and most importantly, according to follow-up phone conversations with cataract project patients, patient satisfaction improved dramatically. The new reengineering cataract process can, therefore, clearly be seen as transforming the Midlands Trust’s ability to deliver this service.

Despite the success in changing practices and the division of practice within the Midlands Hospital itself, attempts to learn from this project to the wider NHS organization were much less successful. Despite the efforts of project members and NHS managers to champion the new procedure, staff in other hospitals were sceptical of its relevance when it was presented to them as ‘best practice’. This resistance was not greatly reduced even when the new team

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\(^1\) The transformation team is a set of eight individuals who are charged with reengineering hospital processes within this particular Midlands Trust. Other current projects include a national initiative on lead-time reduction, a project on diabetes and eyes and a project on hip replacement surgery. At any one time, numerous reengineering projects are underway at the trust.
responsible for the new process were presented with an award by the Prime Minister for their efforts.

Case C: The Lowlands projects at WaterCo

WaterCo is the regulated water business of UtilityCo - a leading environmental services group providing water, waste and utility services. The group has a turnover of £1.8 billion and employs over 14000 people in the UK, US and Europe. WaterCo is the group’s largest operation and one of the UK’s leading water and sewerage companies. It has a turnover of approximately £900 m. It provides water and sewerage services to over three million households and businesses in England and Wales. Serving over eight million people, it supplies nearly two billion litres of high quality drinking water every day through 43,000 km of water mains. The company is organized on a functional basis, comprising the four main functions of asset procurement and investment, engineering, customer relations and technology and development.

The case focuses on a 30-month, £60 million programme to replace filter beds with new activated sludge plant complete with new sludge treatment facilities at a sewerage treatment works in a region of the UK. This site at Lowlands posed high profile environmental problems and the works required a significant amount of asset renewal. The machinery was at the end of its working life and thus its reconstruction had significant planning and environmental aspects.

The programme was original in many respects. Although there were three other major sewerage treatment works reconstruction programmes completed or nearing completion at the time of its inception, none of them was comparable in terms of the level of investment, timescale, dedicated staffing and site organisation. The programme was the largest capital scheme in the firm’s development programme – programmes being usually around £500,000 to £2m in size. At the same time, the timescale was very demanding and the feasibility work, planning applications, assessment and site investigations had all to be done at the same time rather than sequentially to meet an ambitious deadline set by one of WaterCo’s directors. Finally, the programme was unique in its combination of civil engineering works with the complex mechanical and electronic tasks supporting an improved water treatment process. Project activities ranged from building a bridge over a river through to land remediation, additional infrastructures and sophisticated software control systems.

A scheme of this size and technical complexity demanded the coordinated effort of a range of groups inside and outside WaterCo. The programme involved collaboration with a number of external contractor groups, including half a dozen UK leading engineering and architectural

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2 Company names are anonymized here to protect their confidentiality.
consultancies. The primary external contractor, however, was AcmeCo, a major UK-based construction and building design firm. Despite the technical and organizational challenges confronting the programme, it was ultimately deemed a great success by WaterCo management. The water treatment works was successfully developed on time to new specifications and to a much tighter standard. This success was seen as related to important changes in the management of the programme over the course of three linked projects. As outlined below, these changes were significant in allowing the development of new patterns of project-based learning across these linked projects.

The management of the programme centred on the design of the organizational arrangements for the three sequentially-linked projects (termed here projects A, B and C) which made it up. For project A, WaterCo management assembled a core team for the project which was made up of WaterCo and AcmeCo staff, each supported by their own regional head offices and their network of contractors and suppliers. WaterCo team members were all hand-picked and experienced specialists working full-time on the programme. The core team was carefully selected because WaterCo management felt that the timescale did not allow the project to be used as a learning environment for less experienced staff. WaterCo's team on site was led by the Site Reconstruction Manager, who possessed extensive experience of both sewerage treatment works within WaterCo and the site itself. Other WaterCo team members, however, were not based on-site and worked on the project from their offices in the company headquarters. The tendering arrangements with sub-contractors followed the conventional norm in WaterCo. Most of the design work was performed at the start of the project, and sub-contractors tendered to produce pre-defined elements of the design. Design solutions were thus ‘frozen’ at the tender stage.

The learning which took place in project A was essentially technical in nature and driven by the need to redevelop the facilities to meet new environmental expectations. The core team sought to benefit from the experience of recently completed schemes and a significant amount of effort was devoted to benchmarking activities in technical areas, including, for example, chemical dosing systems, tank water tightness, water pump management, and so on. Such benchmarking initially focussed on previous proprietary schemes and included visits to three water treatment works in the Midlands. As the Site Supervision Team Leader commented: ‘We positively sought learning from others we knew to have done similar jobs’.

For projects B and C, however, there was a significant change in WaterCo’s approach which had major repercussions for the dynamics of project-based learning. First, there was a spatial shift. A decision was made by the Site Reconstruction Manager to reorganise all members of the core project team (design, construction and contract administration staff and a site supervision group) to locate them on site with the external contractors. This, together with the
shared responsibility over the final detailed design, gave the core team a certain degree of autonomy and independence from the main office.

In addition to the physical re-organization of team members, these subsequent projects were also subject to different contracting arrangements. Projects B and C were both procured with BuildCo and related contractors on the basis of a single, one-off target price and an outline rather than a detailed design specification. Although each project was distinct in the sense of addressing a discrete set of tasks, the decision to link them contractually reflected a perceived complementarity between the tasks and skills involved – many of the tasks were the same or similar. This arrangement had important implications for the conduct of the project work. Although the projects continued to depend upon a form of inter-organizational collaboration, the linkage between them secured continuity of personnel across projects. At the same time, this arrangement incorporated a ‘shared pain – shared gain’ incentive structure between WaterCo and AcmeCo; partners were to absorb whatever difference, either positive or negative, arose between the actual cost and the target price of the programme. Client and contractors were thus able to develop the detailed design together to optimise both the technical solution and the cost. This created new possibilities for collaborative design, shared ownership and cross-fertilisation between the partners.

The effects of these changes in management approach were to create a greater sense of shared goals and collaboration between WaterCo and its contractors. As AcmeCo’s Project Manager put it;

‘Any problem that comes up, then there’s that common goal of ‘let’s make the decision quickly to solve it and let’s make it with the least cost in mind’; So it’s the shortest time to avoid delay to the job and a least cost option to achieve the objective. That means that people have the same objective rather than the opposite. In the old way of working we would try to maximise value and they would try to minimise it across the project, so you’re working against each other.”

Analysis and discussion

Our analysis of project-based learning within these cases begins with the simple observation that all our cases highlight the important role of existing CoPs, and existing divisions in practice, in mediating the generation and spread of such learning. In the Thurrock case, for example, learning was bounded by a separation between ground-level learning of site contingencies which was the responsibility of site teams, and the tender teams’ concern for the more abstract forms of knowledge accumulation applicable across local contexts. At one level, one might argue that this reflects the ‘nested’ nature of learning in organizations (Levinthal and March, 1993.) Thus, the one-off nature of many projects, solving specific or unique problems,
was traded-off against the repeatability and specialization through which organizational learning was achieved. Moreover, this highlighted the influence of accumulated knowledge as reflected in the functional boundaries of the organization. The development of BuildCo had produced an accumulation of knowledge about project work within the firm, allowing the development of more standardized approaches to construction, the development of functionally specialized roles for individuals and a broad division of labour between head office and site-based activities. This institutionalized separation between the two teams enabled the acquisition of abstract and professional knowledge regarding design and value engineering within the tendering process. Such knowledge could be applied across a variety of spatial environments and was developed at head office by a community of professional specialists rather than through exposure to the narrow contingencies of site work.

The separation of site activities from tendering and design also had the effect of promoting significantly different perspectives and practices amongst project participants. Tendering activities reflected the stories circulating about previous tenders as discussed between colleagues co-located at the regional head office. Building activities reflected experience on previous construction projects, although in this sphere communication between sites was limited. The strict demarcation between the activities of site teams and tender teams ensured that these bodies of specialized expertise were not confronted by experience which might be challenging or equivocal. This separation of practice, rather than any learning effect, seems to explain the difference between planned and actual outcomes in the Thurrock case. The site team simply possessed greater knowledge about the site-level contingencies of building work than the tender team.

This tension between local variation and the standardizing pressures of organizational learning has been previously observed by a number of authors (Levinthal and March 1993). However, as Brown and Duguid note (2001), the danger for organizations is that this presumed trade-off between exploration and exploitation actually reflects ancient institutional demarcations (in the Thurrock case, between ‘head’ and ‘hands’) and is increasingly inappropriate when the local solutions produced by different communities are often critically important for innovation. In the Thurrock case, certainly, the emphasis on the standardization of methods meant that the rich experience of work on site was normatively evaluated as either conforming to or deviating from existing standards. Learning at the project level was associated with errors or mistakes.

In the NHS Trust case we see an example of a project which generates a significant amount of learning within the project. Through their interactions, project members are able to both bring about some change in their own practices – accepting new approaches to diagnosis and treatment – and, more importantly, in the division of practices between them. New protocols are established for the transfer of patients between the different professional groups involved and new inter-professional norms established for the way in which patients are treated.
Despite the significant benefits which this learning brought for the Midland Hospital itself, the failure to spread this learning more widely amongst other NHS hospitals highlights the difficulty of translating new practices across an organization. While new practices created within a project are likely to be localized, it is possible to envisage more widespread learning where such practices can be legitimised and translated through the institutions and norms of a functional or professional community. Changes in divisions in practice, however, may be more difficult to spread, in that they are more deeply embedded in the practices and norms of multiple groupings. Moreover, such changes would require organizational mechanisms for institutionalizing new divisions in practice which are either not available or are widely contested within the professionally-dominated NHS.

Conversely, the Waterco case highlights the extent to which new practices can be spread, at least from one project to another. Significantly, however, these changes in practice were only achieved when the project was able to achieve greater autonomy from its host organization. This enabled greater distancing from mainstream organizational practices, and at the same time, the conditions under which new, shared practices could be developed. That these changes in practice were then retained for a subsequent project seems to have been the result, first, of organizational and technical continuity between one project and the next – the same tasks could be addressed through the same practices and division of practice. And second, it seems to have reflected the project members’ willingness to invest in these new practices in return for the gains which they could achieve together.

Taking our cases together, however, highlights the impact which existing communities and divisions in practice exert upon the organization’s ability to exploit project-based learning. In each case, the opportunities and limitations for such learning were different. This seems to have reflected the importance, as noted previously, of the organizational contexts in which projects were positioned. These contexts involved an institutionalized ordering of different communities of practice, and the relations of power and legitimacy between them (Contu and Willmott 2003), which facilitated certain kinds of learning but precluded others. Thus, in the Thurrock case, the BuildCo organization affirmed a traditional manual-mental division of labour between tender teams and site teams. The communities which evolved around these distinct practices thus promoted divergent forms of learning – centring for the tender teams on the discipline-based collation of technical data, and for the site teams on the individual learning of craft practices.

This can be contrasted with the Midlands Hospital case, where the conscious pursuit of innovative project goals achieved local success through diversity of team membership and high levels of learning within the project. However, the learning from this project was associated with artifacts and stories focussed on an organizational innovation which could not
be readily assimilated within specialized practices which were reinforced and legitimised by formal professional bodies.

Significantly, the one case where we found both learning within, and learning from the project was the Lowlands case. Here, we identified a high level of project autonomy, but also the importance of the continuity from one project to another. Such continuity, when added to autonomy, meant that in some sense, the project became its own organizational sub-unit. One consequence of this was the new practices created within the initial project did not have to be re-digested through an existing division of practice, but could be dynamically carried forward to the emerging activities of the follow-up project. The iteration of project work in this case also had political consequences, as the new contract arrangements effectively applied resource power to the project’s innovative practices. This encouraged individuals to invest in these practices – in effect, creating an embryonic community of practice – and, at the same time, forging a tighter partnership with contractors.

Consideration of the Lowlands case, however, also suggests a need to extend future research beyond locating the project in its organizational context to the positioning of the organization itself in wider institutional, technological and market environments. This would complement the work described previously on project ecologies and regional effects, but focussing less on the movement of individuals across projects, and more on the organization’s shifting powers and positions within wider labour-market and regulatory environments. Thus, developments in practice at Lowlands were made possible in part by a change in the relationship between BuildCo and its partner organization. This mandated the resources and business opportunity through which new practices could be sustained. In contrast, the Thurrock case shows an organization locked into the craft-based institutional logic of the UK construction sector, with important consequences (as with many other construction firms) for its ability to innovate.

Finally, the Midlands Hospital case highlights the important influence of the wider professional, and explicitly political environment on the NHS’ ability to bring about change from the level of practice – bottom-up change as it were – in its organizational processes (Child and Loveridge 1990).

Conclusions

In this paper, we have attempted to develop a practice-based view of project-based learning. We noted that this view seemed to offer some advantages over alternative perspectives on such learning. Thus, cognitive-oriented views seemed to overstate the fluidity of project-based learning, neglecting the problems of embeddedness within organizational contexts. This may have helped to account for the limited effectiveness of cognitively-based attempts to capture and transfer project-based learning.
On the other hand, the existing literature on learning within teams has limited applicability to the dynamics of project work. However autonomous projects may be, they are also interpenetrated by existing organizational routines (e.g. project management routines) and practices. Learning within projects thus reflects not so much the localized development of the team as the way which project members interpret and enact the interplay between project activities and existing organizational practices.

In the remainder of the paper, we sought to explore a practice-based view of project work by focussing on its implications for, and indebtedness, to existing communities of practice and divisions in practice. The comparison between our three cases suggests that these carriers of practice do indeed significantly influence the process and outcomes of project-based learning – certainly to a greater extent than is currently appreciated in much of the existing literature, which tends to isolate projects from the social practices which underpin their execution. We found that the scope and extent of learning within projects is influenced by the practices of established communities. Where projects were routine in nature, as in our construction example, the importation of existing practices was relatively straightforward, securing organizational efficiencies, but militating against the generation of learning within the project itself. In contrast, where the project was highly novel and project membership spanned a range of existing communities, a high level of learning was generated. However, the resulting organizational innovation encountered stiff resistance due to its challenge to existing practices within the wider organization.

The variation in these findings suggested that the influence of communities of practice on project-based learning needs to be related to their organizational contexts. Such contexts not only help to define the ordering and constitution of different communities of practice – as, for example, between craft-based and professionally-based forms – but also the relative influence of existing divisions in practice on the learning possibilities arising from projects. This practice-based approach does seem to provide a more comprehensive explanation for the puzzling inability of organizations to learn from projects which is widely noted in the literature.
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