Engineering identities

Alan Brown

Abstract

Employers attempt to shape employees' work identities through the organisation of work. However, they are partly constrained by employee expectations related to education and training, the occupational structure and the labour market. Employees, individually and collectively, also attempt to influence how their work is performed and play an active role in shaping their own work identities. Work identities are therefore influenced both by structural factors and the agency of employers and employees. This article concentrates upon how individuals working in engineering seek to shape their own work identities. An overview of the broad structural context of working in engineering and metal working in France, Germany, Spain and the UK is given below, followed by an outline of how employers sought to shape work identities.

Keywords
Metal working industry, engineering, work identities, learning while working, change agents at work, professional engagement;

Introduction

This article is a qualitative study looking at the development of occupational identities of employees working in the engineering and metal-working sector in England, France, Germany and Spain.

Images of identity

One way of considering an occupational identity, to which we are adjusted and that is relatively stable over a period of time, is as a psychological 'home'. 'Home' in this context is a "familiar environment, a place where we know our way around, and above all, where we feel secure" (Abhaya, 1997, p2). Viewed in this way it is easy to understand the sense of loss and dislocation that people may feel when they are made redundant, with little prospect of regaining their former occupational identity (Sennett, 1998). On the other hand, religion, literature and film abound with stories of people 'breaking free' and "loosening attachments to 'homes' of many kinds, be they psychological, social or ideological" (Abhaya, 1997, p.2). In this sense, after a period of stability, an occupational identity may come to be viewed as a confinement from which the individual longs to escape. That is, what is initially experienced as

interesting and exciting may, with the passage of time, lead to “a sense of profound dissatisfaction with the comfortable limits” (Abhaya, 1997, p.8) of the existing way of life.

It was this sense of unease that may set in for an individual with his or her occupation over time that surfaced in a number of our interviews. The challenge was then to represent this change in the way an individual regards the work they do in a dynamic way. After all, Dewey (1916) had seen an occupation as giving direction to life activities and as a concrete representation of continuity: a 'home' with clear psychological, social and ideological 'anchors'. But what of the process for some individuals where the 'anchors' become progressively perceived as 'chains'? We need a representation of occupational identity that can theorise change as well as continuity.

Studies of occupational socialisation have revealed processes by which individuals may be included (Coffey and Atkinson, 1994; Evans and Heinz, 1994) or excluded (Brown and Behrens, 1995), and the different types of occupational commitment (Coffey, 1994) or organisational commitment (Baruch, 1998; Baruch and Winkelmann-Gleed, 2002) that may result. These studies of the processes of becoming skilled have increasingly sought to view individuals as active participants in the creation of a ‘new’ community of practice rather than just passively joining an existing community (Lave, 1993; Wenger, 1998; Billett, 2004). The dynamic model of occupational identity formation proposed by Brown (1997) acted as one of the theoretical cornerstones of the project methodology. In particular, it informed the choice of broad issues upon which to focus the interviews with employers and employees: workers engagement with their work activities; their interaction with others; and their learning and development.

Also, the restructuring of work, and uncertainties over prospects of obtaining work in the field for which individuals have trained have increased the importance of transitions discontinuities and shifting contexts of career development. (Heinz, 2002). While Heinz (2002) looks at how these processes affect the biographical shaping of early work careers, our study examined the effects on experienced workers with established work identities. The investigation of work identities extended beyond the

company to include other sources of identification and non-work commitments that could influence identification with work and work-related commitment. Even within work sources of identification could vary and include not just to the organisation or occupation, but could relate to a specific work group (Baruch and Winkelmann-Gleed, 2002) a particular work environment, a set of work activities, relations with others and so on, all of which may change over time, as may the significance individuals ascribe to them (Brown, 1997; Ibarra, 2003).

Context: Learning and working in engineering

The prospects for a skilled worker in the engineering industry at all stages of his or her career are now much more problematic than more than a generation ago when they represented the 'aristocracy of labour' in secure, well paid work (Venables, 1974; Tuxworth and Ciechanowsi, 1987). Training places are much harder to find and entry into skilled employment is much more hazardous (Heinz, 2002), to such an extent that, even in Germany, there are concerns that the whole apprenticeship system is being undermined (Kutscha, 1996). As well as problems with initial training systems (Finegold and Soskice, 1988; Marsden, 1995; Mason, 1999; Ryan and Unwin, 2001), prospects for further progression, once qualified, are greatly reduced (Elias and Bynner, 1997 a, b). There are far fewer promoted positions because of organisational restructuring, particularly at supervisory and junior managerial levels, and there is increased competition for such posts particularly from graduates (Soskice, 1993; Rolfe et al., 1994; Elias et al., 1999; Purcell et al., 1999).

However, the prospects are not uniformly bleak. Although numbers employed in the engineering industry have fallen (Mason and Wagner, 2002), there is a continuing strong demand from employers across Europe for workers with technical skills allied to ‘modern’ skill sets, including abilities to work in teams and communicate effectively (Davis et al., 2000; FAME Consortium 2003). Similarly, there are still promotion opportunities for skilled workers to supervisory or specialist positions in some companies in all the countries studied, but this depends on them having ‘modern’ skill sets and/or undertaking further training (Drexel et al., 2003).

Many companies have been introducing greater flexibility in work and expect staff to accept resulting changes in patterns of work organisation, often involving team

working or attempts to improve manufacturing practice through a focus upon continuous improvement (Edwards and Wright, 1997; Culpepper and Finegold, 1999). In the UK there were sometimes explicit attempts to follow Japanese 'best practice', with an emphasis upon machine turn-round times, 'right first time' and so on (Wickens, 1987; Brown et al., 2004). However, as in the US (Cutcher-Gershenfeld et al., 1994), there was often considerable variation in how these practices were operationalised (Wood, 1991). So although flexibility in work organisation has been a major goal of employers in the sector, there have been major differences in companies' attempts to achieve this (Doyle et al., 1992; Thompson et al, 1995; Ackroyd and Proctor, 1998; Wright and Edwards, 1998). This means UK discussions of team-working do not necessarily involve use of the more participative production concepts which have been debated in Germany (Wright and Edwards, 1998) or wider European concepts of partnership (European Commission, 1997). Indeed, Ichniowski et al. (1996) highlight how the lack of a legal framework promoting 'social partnership' and pressures for short-term returns in market-driven economies, such as those in Britain and North America, make workplace restructuring through team-work particularly difficult. Similarly, there is debate about how far the traditional German skills formation system, supporting diversified quality production, using the abilities of highly skilled workers and engineers, with a focus upon individual performance is compatible with a more decentralised team-based approach to production (Herrigel, 1996; Finegold and Wagner, 1999). The role played by production supervisors varies widely too (Mason, 2000): sometimes their role was enhanced (Wickens, 1987; Brown, 1999), whereas in others the supervisor's role could be severely curtailed or even eliminated (Buchanan and McCalman, 1989; Wright and Edwards, 1998). However, even the absence of direct supervision of work-groups did not necessarily mean control was decentralised, as teams could still be operating within a structure of continuing management dominance (Geary, 1995), and work could still be fragmented and tightly controlled (Pollert, 1996).

Wright and Edwards (1998) point out that in some cases of the introduction of team working the emphasis is more upon work intensification than high performance. Indeed in the UK there were examples of major manufacturers pressurising their suppliers, sometimes through the use of very aggressive year on year cost-downs (Brown et al., 2004). This is line with only a minority of UK firms' choosing models

of competitive advantage that utilise a high skills route, preferring instead to rely upon cost based competitive advantage and produce relatively low specification goods and services (Doyle et al., 1992; Williams et al, 1990). Regini (1995) argues a similar case could be made for Europe as a whole. That is, the model of a high skills/high value added strategy allied to a supportive vocational education and training system that can deliver a highly trained workforce, as in Germany, is simply one of a number of viable models available to European firms and nation states (Regini, 1995).

Similarly, there is no straightforward pattern as to what happens to the distribution of technical skills following the introduction of team-working, as even where these are redefined and upgraded this will occur in ways which reflect differing social contexts (Thompson et al, 1995). Hence it is unwise to generalise about changes in particular skill distributions for three principal reasons. First, the change to team-working may be part of a much broader 'bundle' of changes in work organisation, pay and organisational structures (MacDuffie, 1995). Second, the changes made were often in response to significant external shocks (Wright and Edwards, 1998). Third, operatives, craft workers, technicians, supervisors or junior managers may gain or lose duties at any of the boundaries they share with others (Rolfe et al., 1994), depending partly upon how other changes produce variations in the skill mix (Davis et al., 2000).

Overall then, the distribution of skills within engineering companies could differ according to the product market strategy followed (Wood, 1999), the forms of work organisation adopted (Thompson et al, 1995) and the size of the company (Scott and Cockrill, 1997). For example, some companies were shifting their focus from direct manufacturing to provision of engineering services and this required changing skill sets for employees (Drexel et al., 2003). However, the changes outlined above, and especially concerns about competitiveness has led to increasing attention being given to work-based learning (Eraut et al., 1998; Rainbird et al, 2004), particularly in relation to team working, continuous improvement programmes and supervisory training (Drexel et al., 2003). In the UK some employer support for learning and development focused upon supply chain development (Brown et al., 2004), while in Germany some employers felt that such co-operation had been a long-standing feature of inter-company relationships (Culpepper and Finegold, 1999). In all countries

studied external training and/or qualifications are linked to work requirements, but some employers encourage all forms of learning as part of more general employee development programmes (Maguire and Horrocks, 1994). Some companies in all countries were making greater use of graduate level entry for supervisory or production support positions (Rolfe et al., 1994; Mason, 1996; Drexel et al., 2003).

In areas such as aerospace "organisations that deploy a wide range of high performance working practices are also investing much more in off-the-job training - 159% more than those making low use of such practices" (Thompson, 2002). Companies vary greatly in whether regular work activities provide an expansive or restrictive learning environment (Fuller and Unwin, 2004), depending upon how work is organised, the nature of production and the size of the company (Bull et al., 1995; Scott and Cockrill, 1997). Different groups of workers may also have differential access to further education and training. This means that employers' commitment to learning is very variable, but general competitive pressures and actions across supply chains are driving at least some learning in the workplace (Mason and Wagner, 2002).

In the UK in particular, organisational commitment rather than occupational identities drives much of the organisation of work, often with an explicit emphasis on flexibility and multi-skilling (Mason and Wagner, 2002). These trends are noticeable to some extent everywhere, and some German companies viewed the attachment of workers to a single occupational perspective as problematic in attempts to introduce greater team working (Finegold and Wagner, 1999). However, in all countries there are enormous variations in the degree of skills required of workers in different workplaces. Spain and the UK have in the past made more use of low skilled labour than France or Germany, particularly in small or medium size companies (Prais, 1990).

When considering the relationship between the organisation of work and work identities it is important to distinguish between companies where skilled workers are a very small minority and production is largely routine and those where more highly skilled workers play more of a role in production, support and related activities. In the latter case companies were making different choices about the appropriate skill mix, particularly in relation to the employment of graduates or those with craft or other intermediate skills (Mason, 1996; Drexel et al., 2003). However, the latter distinction

was becoming blurred as countries opened up progression routes so that more individuals had both intermediate skills and graduate qualifications. Interestingly, with the under-development of intermediate skill formation routes and the massive expansion of higher education (HE) in the UK opportunities were available to develop intermediate skills as part of or subsequent to HE study (Soskice, 1993; Mason, 1996; Senker and Senker, 1997).

Research Methodology

Context

This article is based on material and ideas that have been generated in the on 'Vocational Identity, Flexibility and Mobility in the European Labour Market (FAME) research project. A detailed description of the research methodology is given in the introductory paper of this edition of the journal. The aim of the project was to map the different ways work identities are composed and restructured when employees are challenged to cope with demands for flexibility, changing work situations and skill needs. A qualitative approach was chosen with key ideas being drawn from the dynamic model of occupational identity formation proposed by Brown (1997). A diagrammatic representation of the proposed model is outlined in Figure 1.

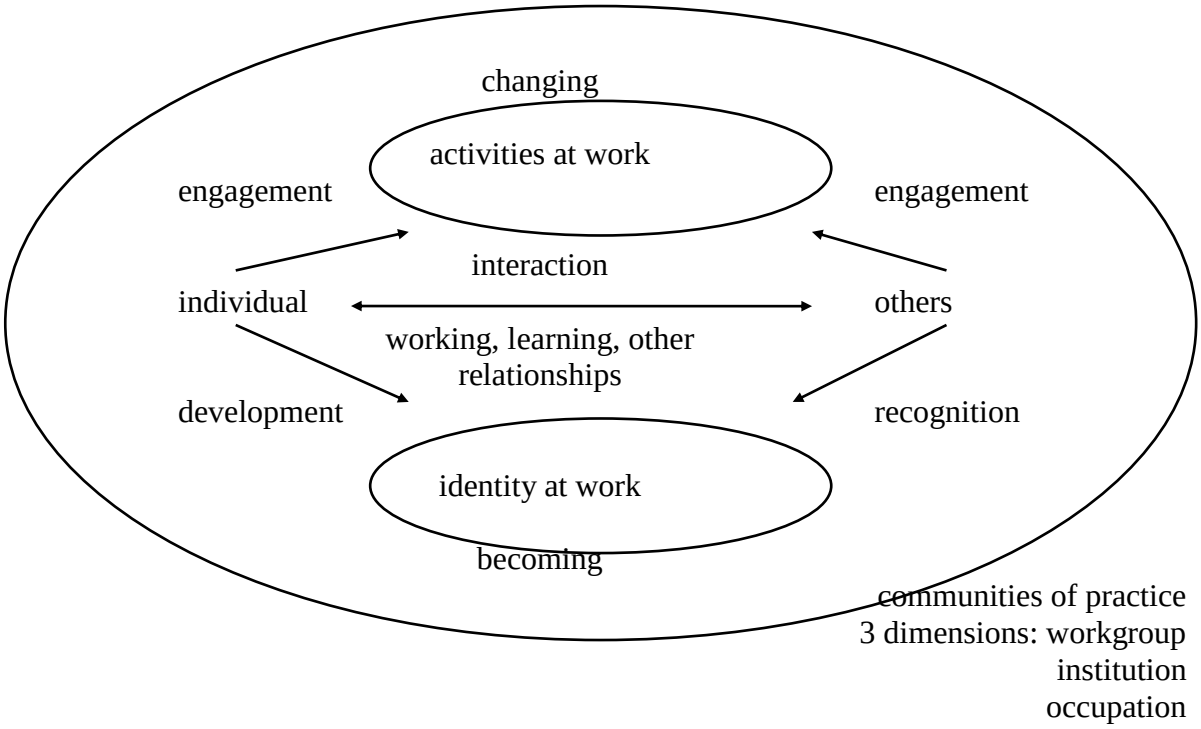


Figure 1: Model of occupational identity formation

Drawing on this model, it was possible to identify the broad issues upon which to focus the interviews with employers and employees: workers engagement with their work activities; their interaction with others; and their learning and development. The relationship between the employers and employees attempts to shape employee work identities could be represented as follows:

> **Employers,** while being constrained by competition; interdependence; uncertainty of demand; and complexity of their product or service etc.,
>
> use organisational structure; vertical and horizontal mobility; flexibility; learning and development; organisation of work; individual scope; power and control
>
> in their attempt to shape **work identities** through the work people do, particularly in relation to:
>
> - workers engagement with their **work** activities
> - their **interaction with others**
> - their **learning and development.**
>
> However, in this they are constrained by the nature of **societal** influences, 'offers' and expectations coming from education and training; the occupational structure and the labour market

> and by the action of **workers**, individually and collectively, also to influence how their work is carried out (influence here of work groups; communities of practice; custom and practice; trades unions etc.) and the nature of their **work identities**. The nature of work identities, however, is also necessarily affected by processes internal to the individual in terms of their **self-reflection and appraisal of their current situation.**

The article focuses upon the development of work identities in the engineering and metal working industry. This sector was chosen because it was one where long established occupational identities are confronted with significant challenges in terms of employer requirements for flexibility and mobility. Also it is a sector where England and Germany could be seen as carriers of very different approaches to work identities.

Data Collection

The aim of the research was to focus upon the structural and individual aspects of occupational identity formation and this was reflected in the research design and the framing of the data analysis. The first research phase involved interviews with 39 managers, drawn mainly from human resources (HR) departments, in companies of varying sizes across the four countries (10 in England; 8 in France; 10 in Germany; 11 in Spain). The intention was to explore the structural context within which they were operating and to glean what the managers expected from their employees in terms of identification, commitment and learning, and whether they were actively trying to shape work identities of employees through their HR policies. The interview results helped to outline the structural context within which work identities were developing. The second phase of the research aimed at drawing out complementary material on work identities, but this time focusing upon the individual perspectives of 132 employees (38 in England; 30 in France; 33 in Germany; 31 in Spain)..

The qualitative research methodology involved carrying out semi-structured interviews according to a set of interview guidelines agreed by the project partners. All partners carried out initial pilot interviews followed by mainly individual, in-depth interviews (although occasionally small group discussions with 2 to 6 employees were held), usually not exceeding 90 minutes. Typically interviews were tape-recorded and transcribed verbatim. Interviews with representatives of HR departments and mangers were conducted mainly in 2001; interviews with employees mainly in 2001 and 2002.

In total, interviews were conducted with 171 employees and managers with varying levels of qualification, specialisation, skill profiles and responsibilities. The interviewees were mainly drawn from companies in the aerospace or vehicle manufacturing sectors. Most respondents worked either for manufacturers or for companies involved in supply chains in the two sectors. Being a gendered occupation over 90 per cent of the participants were men: there were just seven women. The age of participants ranged between 21 and 57 years and they had between 3 and 40 years of work experience.

Data Analysis

The data analysis was informed by grounded theory as a means of eliciting respondents' own categories (Glaser and Strauss, 1967). These categories were developed within the frame of the broad evaluation categories that the partners commonly identified as being relevant to the development of work identities, following the pilot interviews. For those working in engineering one very strong strand in the responses of employees related to their strategic biographies, where invariably they explained their current position and attitudes to work in terms of their own past history. This is the strand of analysis that underpins the current article and will be represented by descriptions of some exemplary individual cases. The main focus is therefore upon how employees sought to develop their own identities. However, first this is put in context by a consideration of how employers have sought to shape employee identities.

Findings: How employers sought to shape employee identities

The implications of the earlier contextual discussion is that there is considerable diversity in product market strategies, skill mixes, organisation of work and patterns of learning and skill development in the engineering and metal working sector in Europe. This was borne out in our interviews with staff. Indeed perhaps there were only two elements common to most companies. One is that some or all the above

were likely to be changing, often in the face of increasing competition. The second was that employers in all the four countries studied seemed keen to make employees aware of the need to make changes in the organisation of work in order to make the company more competitive. There was a discourse based around an assumed global vision of effective working processes and practices (FAME Consortium 2003). The success of this strategy could be gauged from the response of many of the employees interviewed in Germany, Spain and the UK all expressing satisfaction with their work despite significant work intensification. In some cases this was because a smoother production process had ironed out difficulties that had caused problems for workers in their jobs. However, some employees in all four countries also mentioned that they took a pride in the improved effectiveness of their companies even if this sometimes meant sacrifices upon their part.

With all the changes outlined above, some human resources staff were consciously trying to reshape the focus of commitment away from an individual attachment to a particular occupation and more towards the team. Identification with the company was encouraged, but often not to the extent of in the past (when workers were expected to work for an employer for a lifetime). This process is evident in all countries, but has probably gone furthest in the UK. Employers are trying to achieve balances between autonomy and control and identification with the company without over-identification (and dependence).

In many companies in all four countries there is a greater emphasis upon mutual support by employees, whether or not this is associated with team working. The greater commitment being demonstrated to the company is thereby mediated by a desire not to let colleagues down. This means that although attachment (in the sense of an expectation of a long relationship with a particular employer) may be weaker than in the past, de facto commitment in terms of task completion and role fulfilment may be higher.

Overall changes in the structural context have meant that occupational identities in engineering and metal working are undergoing significant change, particularly in response to increased competition and changing patterns of work organisation. Occupational identities were particularly likely to be in flux for employees working in

multi-functional teams, or as change agents, team leaders, or supervisory staff whose influence had been reduced, or in companies that have shifted from direct manufacturing to providing engineering services. In all these cases the type of work undertaken and the mix of skills required were changing, in some cases dramatically.

Identification with challenging work

In some instances challenge was at the heart of the work being performed. This was more likely in some occupations and sub-sectors than others, but where it did occur employer and employee perspectives were generally in strong alignment on three central dimensions:

- Engagement with work activities: very high - challenging work; high levels of employee autonomy and responsibility; sense of pride in work processes and outcomes;
- Interaction with others: key relationship is with the employer with high trust and high commitment expected (for example, through willingness to give of own time - either directly, as in unpaid overtime, or indirectly, through thinking through problems or discussing them with others outside work);
- Learning and development: learning through working as a major form of development, but with training and support for key roles, such as project leaders and system engineers.

This was the classic form of 'professional engagement' of highly skilled workers. This was, however, not unproblematic. The focus upon quality, personal performance and identification with a particular type of work could in some circumstances be problematic, particularly where the employer was giving more emphasis upon balancing quality with cost and time considerations. Similarly where multi-disciplinary team-work had been introduced and workers were expected to be willing to undertake a wide range of duties, then strong attachment to particular 'traditional' occupational perspectives could generate tensions.

Increasing use of graduates

The increasing use of graduates in the sector was a widespread trend. In France, the principal driver for some large companies was the desire to get young, more highly

qualified workers who were expected to be more flexible in their approach to work, easier to retrain as required, and willing to undertake a range of work. They were expected generally to display attitudes more in tune with 'modern workplaces'.

These trends were reinforced where companies were making more complex sub-assemblies and/or selling their expertise in collaboration over design and manufacture, not just selling components. Such changes, evident across Europe, though not in all companies, had resulted in the need for a more extended knowledge base, and this presented a significant challenge not only in terms of initial qualifications, but also in relation to a continuing commitment to learning and development. These changes favoured the employment of graduates. However, such graduates need not necessarily have entered higher education straight from school. In France, Germany and the UK there was evidence of employers encouraging progression routes that built upon work experience and work-based qualifications and led through to degree qualifications.

Whereas the employment of more graduates was relatively unproblematic in France and the UK, this was not so in Germany. There such changes were potentially more disruptive, as they had major implications for those skilled workers looking to become Meisters. The whole structure of a progressive work-based route could be undermined in those companies where work previously undertaken by experienced Meisters was now performed by graduate design and process engineers. One German manager remarked that the company strongly preferred to recruit new graduates and train them in the company way, whereas in the UK the greatest demand is for graduates with some experience. The former was concerned with identity development, whereas the latter were more interested in skill utilisation - the more 'work ready' the graduate the better. Employers can attempt to reshape work identities to accommodate various changes at the level of the individual company, but there may be longer-term sytemic implications, as in Germany in relation to the relative attractiveness of the dual system, Meister training and HE (Drexel et al., 2003).

Desire for employees to have a greater range of communication skills

Employers sometimes wanted to reshape work identities so employees interacted more intensively not only internally through project teams and work groups, but also externally through supply chains. This had implications for interactions with others

(including working with colleagues from other countries and/or other companies) and learning and development (of inter-cultural communication and co-operation). Marketing in its broadest sense was also becoming more important and many employees had to be able to 'represent' the company when dealing with people from outside the company, including of course customers. This meant there was strong employer demand for employees to have a greater range of communication skills than in the past.

Accommodation to changing non-work values

Some employers actively tried to shape employee identities, but others also sought to accommodate the changing non-work values of their employees. They recognised their employees' identities at work could be linked to other aspects of non-work identities. This could be manifest in support for various forms of employee development that did not link directly to organisational development. However, there were still many examples of employers sending explicit or implicit messages to staff that non-work activities (including family life or preferences of other family members) should not 'interfere' with work decisions. This was perhaps most evident in France and the UK where in some companies it was clear that a refusal to relocate could be held against you and harm your career progression prospects.

Employers' attempts to shape employee identities in the light of structural features of different national systems

In France employers' attempts to shape employee identities and the structural features of the national system seem broadly congruent. The structural features include the development of the vocational baccalaureate, the strengthening of technical education and training, greater attention being given to employer-directed continuing vocational training and employee self-directed continuing learning and development (including through the *bilan de competence*). These align with the changes consequent upon employers in the metal sector making greater use of more highly qualified labour, including graduates.

In Spain the apprenticeship system has recovered after a short period of decline, and continuing training, including that offered by suppliers or vendors, seems to be well-regarded. The hierarchy of employment conditions means that the desire to get

permanent employment with the ‘best employers’ drives the demand for initial and continuing education and training in this sector.

In the UK apprenticeship and other intermediate skills development routes remain under-developed. However, employers appear to have adjusted to this in their organisation of work and where they are trying to follow a ‘high value added strategy’ or upgrade their skill base they have been making use of the expanded pool of graduates and/or using work-based development strategies. The latter have sometimes been based around formulaic approaches to continuous improvement derived from Japanese manufacturing practices.

In Germany there is a sense of a system in flux. The metal working sector has traditionally been based upon strong institutional support, employer interdependence and complexity of (high value-added) products, but the dual system and Meister training are currently under strain (Kutscha, 1996). Also companies are finding that strong occupational attachments of workers are under pressure in relation to the need for new forms of interaction with customers and team working, and this has consequences for learning and development of communication skills and multi-disciplinary co-operation.

A wider question is whether employers’ attempts to shape work identities aligns with societal ‘offers’ and individual perspectives in a sustainable way. For example, in Germany should the initial work identities of employees now be based around a more fully developed (graduate) knowledge base rather than on the traditional strengths of ‘incremental’ innovation, linked to the specialised knowledge of work processes and practices based upon advanced craft skills up to Meister level? The model of incremental innovation is itself linked to powerful societal and institutional support, including employer networks, related to the use of medium-level technology and the production of high quality products in established industries (Culpepper and Finegold, 1999). The old skill formation system, however, was also highly gendered and slow to respond to the increasing cultural diversity of the workforce (Krueger, 1999). In this sense work identity formation has to be linked to identity formation processes in the wider society. Some of the employee interviews though indicate the resistance encountered in everyday practice by those who challenge stereotyped work identities

even when they are offered a job by employers looking for talent beyond the ranks of young German males.

Strategic action by employees building their work-related identities

The major aim of the FAME project was to answer the question of how employees respond towards changes in their working environment and working lives. So far structural changes and employers' attempts to shape work identities have been outlined. However, what are individuals' strategies for coping with these changes and how do they affect their work identities? The intention in this section is to look at individuals' personal responses, reactions and interpretation regarding changes at work. This will be followed by a commentary upon the policy relevance of the findings.

The focus is upon the strategic actions of those working in metal work and engineering based upon the 'strategic biographies' of individuals. This biographical perspective is useful, as for many individuals the nature of their commitment and work-related identity changes over time. Our interviews highlighted that the relationship between individuals and the occupational roles they were required to perform could be represented in terms of their patterns of strategic action across a range of structural, cultural and social contexts (compare Pollard *et al.* (2000) doing this for pupils over their school career). Their careers could be mapped in terms of their patterns of relationships, orientation and adaptive response to work and it is possible to trace the dynamic development of individuals' characteristic repertoires of strategic action - their 'strategic biographies'.

> **Identification** represents the 'classical' form of adaptive strategy - the individual identifies more or less completely with work and the employing organisation. Through strategic compliance the individual seeks to satisfy expectations (of employer, colleagues and customers or clients) of how to perform her or his role. They usually accept the conventions of their workgroup and are integrated into their occupational and organisational life. They are likely to remain in the same job for a considerable period of time. For our interviewees this was probably the

largest category. But significantly we had a number of (mainly older) people for whom this relationship went sour.

In all four countries we also had examples of people starting work in production, maintenance or other technical areas and then time being promoted to, for example, a supervisory position. This could be seen as a natural progression and need not necessarily interfere with their initial occupational identification, although some promotions do result in a distinct break with the former occupation and involve a re-definition of an individual's role.

Long-term adjustment represents a more conditional form of adaptation - the individual may remain in an occupation and/or with a particular employer, but recognises that this represents a compromise. Typically factors outside work (family commitments, attachment to a particular location) may 'hold' an individual in place. The individual may still seek to satisfy role expectations (of employer, colleagues and customers or clients), but typically has some reservations about work. The individual may stay in the job for a long time, but may move on if the 'holding' circumstances change. Examples of reasons why interviewees felt 'locked into' their current work included accommodation to working patterns of a partner; attachment to a particular locality and attachment to their immediate work group. There were also cases of women who really liked their work, but could not fully identify with it because of the extent of the harassment they faced from male colleagues.

Short-term adjustment represents a fully conditional form of adaptation - the individual only intends to remain in an occupation and/or with a particular employer for a short time. Because of individual circumstances, choice, career plans or dissatisfaction with work, the individual is actively seeking alternative employment. Some interviewees were looking to change employers. The slack labour market in Germany meant that some companies recruited former engineering apprentices to work in areas like the warehouse and these employees adjusted to work requiring no engineering knowledge whatsoever, while hoping to get skilled work eventually.

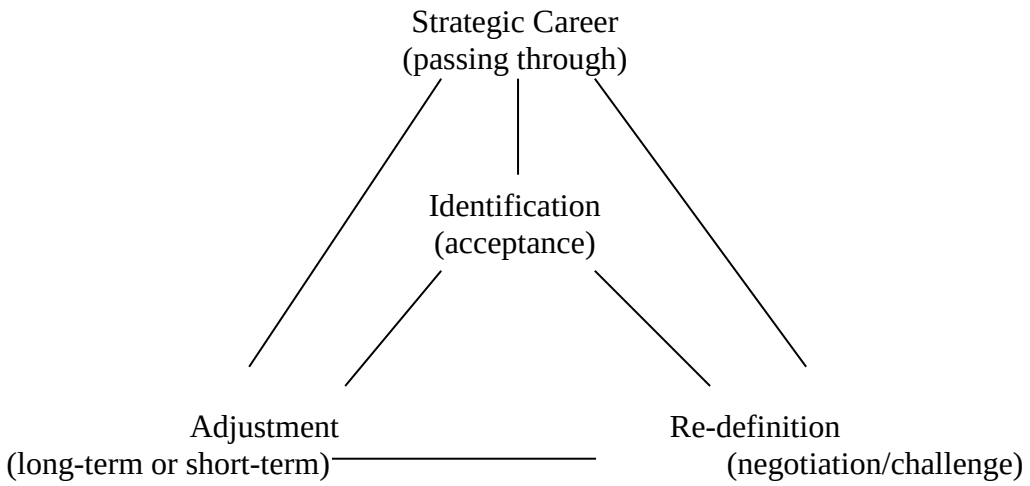
Strategic careerists see their current occupational position and/or organisational attachment as one phase of a career that involves relatively frequent changes in the nature of work they do. They are committed to 'moving on' and see their careers as something that they actively construct (although sometimes the employer has a development plan for an individual on a 'career track'). Their attachment to their current role is partly influenced by the knowledge that they are only 'passing through'.

We did come across individuals who identified with their work, but who were active in **re-defining**, rather than passively accepting, work-related roles. **Re-definition** is associated with the same mainstream patterns of achievement and cultural norms as those exhibiting more passive forms of **identification** (Pollard et al, 2000). However, those using **re-defining** strategies are operating at the cutting edge of norms and expectations, pushing at the boundaries of expectations of employers, colleagues and others, typically negotiating, challenging and leading their peers in some respect. Such reshaping could come from 'within' a role and sometimes from 'outside' (or above), and, although rare, there were some examples of redefining their roles.

The second form of **re-definition** occurred when an individual sought to change their occupation and/or employer, because they wanted (or saw themselves forced) to change career direction. There were examples where individuals had changed career direction quite radically, both into and out of engineering.

It is possible, building upon these ideas, to construct a model of how individuals could relate to their work, possibly moving from point to point over time (see Figure 2).

Figure 2: A model of the forms of strategic action of individuals in relation to their work



In the following commentary we give examples of each of these forms of adaptation.

a) Strategic careerists 'passing through' occupations

There were former engineering apprentices who moved into commercial functions very early in their career and then progressed into management. Such transitions were common in a number of different settings and national contexts.

Engineer with strategic career moving between occupations and sectors

Richard is an engineering graduate, in his mid-forties, who worked in engineering, contract electronics, supply chain development and finally moved from the technical side into the commercial area. He worked for a large engineering company for seven years mainly doing project work, and then took a manufacturing management conversion programme for engineers. Richard then returned to another division of the company as a logistics manager, but he decided to follow a developing interest and he switched to working in contract electronics, then he moved to an IT company and eventually became a supply chain manager with a large company of drinks suppliers.

Richard has always been highly committed to his work that has often involved being part of a project team. He sought to increase his experience in areas that were

business-led rather than technical, when he recognised he had much less international market experience than others in the commercial field. On the technical side he had gone as far as he was likely to go. This is a 'classic' example of a strategic career with little long-term attachment to either a specific occupation or a particular organisation. While this approach is in some ways identified as a 'modern' orientation, in fact this has long been a common route for those seeking to get into senior management positions in the UK.

b) Identification with occupation and employer

In all four countries studied many individuals had a strong attachment to their occupation and employer. The identification could be to their chosen technical profession, but the image of the company (precision engineers) or its products (aircraft or luxury cars) could complement their view of themselves as 'highly skilled'. This type of identification was most common early in a career, but it was perhaps most complete for those who had been working on more or less the same track for more than twenty years as the following examples illustrate. These particular examples are drawn from France and Germany, but almost identical cases could be drawn from Spain or the UK.

Skilled worker promoted to head of maintenance but with an unswerving identification with occupation and employer

Henri has been head of a production maintenance team of a major vehicle manufacturer for fifteen years. He is now in his mid-fifties and started with the company in 1976. His work involves planning, animating and co-ordinating the activities of the maintenance team in informal and formal interactions and establishing continuous links with other teams within the plant. Henri was initially trained as a 'fitter-toolmaker' at a vocational school. All his subsequent work-related training has been designed to promote adaptability to new products, services, techniques and technological processes.

Henri has a good working relationship with management and enjoys a relatively high level of autonomy and responsibility in his job. He once exchanged his position with the head of the production team for one year, allowing Henri to familiarise himself

with the work of other departments and teams, enrich his personal know-how, extend his relational network and to feel his skills were transversal.

Henri is highly committed to his work, the company and the quality of the cars produced, and is quite satisfied with his career. He values job-stability (despite the structural and technological changes), relatively interesting work, and the financial and non-financial rewards his job offers. He believes in achieving a reasonable balance between his attachment to work, his own family and commitments towards his district community. He is active on the council of a local college parents' association and as a vice-president of a district association working to establish a socio-cultural centre.

Engineer promoted to team leader with an unswerving identification with occupation

Ludger is an engineer in his fifties and works as a team leader in a large European aerospace company in North Germany. After completing an apprenticeship as an engine fitter, he studied mechanical engineering at university and graduated six years later. He began work for the company in the late 1970s and is currently a project co-ordinator, writing project proposals, supervising projects and seeing them through to completion. Most of the specialised technical skills required have to be learnt on the job, especially through 'learning by doing'. Currently he is working on 14 projects, ranging from small 'free research and development' projects through to the International Space Station. It is rather unusual to work on so many projects and in order to cope with the workload his team has been expanded.

Ludger works and make decisions independently and his team consists of 6 engineers. Officially the position of team leader no longer exists. It was axed in order to eliminate traditional hierarchies and facilitate better co-operation between engineers and their superiors. In practice, however, this position is still necessary and Ludger is still referred to as a team leader, someone who co-ordinates projects.

Ludger believes that as an engineer he has the will and motivation to construct something new and see the results of his work. He strongly identifies with his work, the products and takes pride in the projects he sees through to successful completion.

Formerly, he used to identify strongly with the company, but as a result of numerous organisational changes, including changing the name of the company, his core identity now lies solely with his work and work activities. One very important factor shaping Ludger's occupational identity is the recognition of his work by colleagues and from collaborating companies. Generally, Ludger is very satisfied with his work. He sees new tasks as a challenge and an opportunity to learn more. Conflicts with colleagues in his team are rare.

There are some drawbacks, however. The most obvious conflict arose between Ludger's approach to work and new demands from senior management. He feels the need to work thoroughly and check and test a product for possible mistakes more often than officially required to be very sure everything is technically sound. This, however, contradicts with the pressure from management for not putting too much emphasis on one single product and not spending more time and money than necessary. In contrast, Ludger's conviction is that priority should be given to completing a project without mistakes. Although this may initially imply higher costs, Ludger believes it is cheaper in the long run since the clients and engineers can be sure that the product works thus considerably reducing the risks of a complete failure. But this principle puts Ludger in a difficult situation, as he is regarded as too cautious with certain technical 'solutions' and he fears that this might result in an exclusion of his knowledge and expertise. His decisions have to be well thought over, because he worries about the consequences of possible failures.

Time pressure also generates conflicts. The workload is constantly increasing and the time span of projects reduces. Formerly, one project would be completed before starting work on the next. Now several projects overlap and have to be handled at the same time making work more complex, interdependent and interactive. This leads to an increase in stress, but can also be seen as an opportunity to learn to work on an interdisciplinary basis.

c) Long-term adjustment

Long-term adjustment can occur where an individual recognises that her or his current job and/or employer is not ideal, but all in all it is 'the best job they are likely to get'.

Another form of long-term adjustment could represent a ‘more explicit compromise’, when an individual could get a better job elsewhere, but is ‘held’ in place in their current job by factors outside work. The following gives an example of the latter type of adjustment.

Former engineering apprentice initially adapting to work because of family commitments, then deciding in his mid-thirties upon a strategic career direction

David is in his early forties and worked for the same company for 20 years. He started apprenticeship training with the local car manufacturer at 16. He continued with day release at college, leading to technical HE qualifications, and was eventually employed as an engineer working on engine development. David and his wife came from a small town close to the plant and had strong family and other local attachments. His wife was self-employed and had built a loyal client base, so he continued for eighteen years to work at the same plant, which was the only large engineering employer in the area. When they had two children the local links were intensified, but he finally decided to move: “I think the only real reason I moved out was because I knew I'd be stuck in a dead-end job for the rest of my career”.

David transferred to another plant over a hundred miles away to take a more challenging job in engine design and development. His family did not move, and he commuted at week-ends. He worked there for five years and completed a part-time Master’s degree in manufacturing management. He felt his combination of experience and qualifications were not recognised by the company, so he looked for other work. Going on the Master’s course had extended his horizons and networks and he received various job offers.

David accepted a job with another car manufacturer on a ‘contract basis’ for two years, and then he ‘was gently persuaded’ to join a firm of consulting engineers. He recognised “there were opportunities to get on in a young small company and I knew that with my strengths I could develop quite well, and the money was good”. The job as project operations manager was challenging, with responsibility for all stages of the design, delivery and test process, a large team to manage and considerable autonomy. This type of work was only available as a consequence of a major policy change by

the manufacturers now favouring strategic partnerships with suppliers who would supply specialist expertise in co-developing major components such as engines.

There was one major drawback with the job, the commuting involved journeys of four to five hours, starting at 3.30 on Monday morning and not getting back till 9 on Friday evening. He did this for nine months before finally the whole family did move. This time the location was similar to what they had been used to and there were good schools for the children and work opportunities for his wife. Even so it was still hard to move, but "the travelling had been really hard, very very stressful". He was for the first time really committing to a company.

Overall then, he identified with his work as an engineer, but for a long time he adapted rather than identified with his company because of the strength of his family and local attachments. With the new company he felt he belonged. Previously his travelling (and studying) had contributed to feeling that he did not really 'belong', and in the original company he 'belonged' to the area rather than the company. However, after making the initial decision to move he set about strategically building his career in ways that fitted to the new 'flexible' working patterns. He took temporary assignments, studied part-time, took contract work to broaden his experience and paid attention to building a network of contacts. It was one of his contacts, who was putting a team together at the engineering consultants in line with the new co-developing arrangements with major manufacturers, who offered him his present job.

d) Short-term adjustment

In cases of short-term adjustment an individual intends working in her or his current job for just a short period and is likely to be actively seeking other work. For example, two of our interviewees were being made redundant with relatively little chance of work in that sector in that area, while a third had been unable to get back into permanent employment after a series of setbacks.

Short-term adjustment to problems at work and an employer switching production

Georgina is in her 30s and is a machine operator at an automotive component manufacturer at a factory in the North of England that was due to close. Production was being shifted to another plant a few miles away. The workers were given the option of transferring to the new facility but on greatly reduced pay, so Georgina, like most workers at the plant, was to be made redundant. She had until recently been a team leader with full responsibility for a components line, including introducing changes aimed at improving performance. However, because she did not get on with her line manager, she had asked to go back to being a machine operator.

Georgina had recently volunteered to participate in training designed to improve performance in the company's supply chain. The training involved workshops and practical experience of how to improve manufacturing processes and practices. She was part of a multi-disciplinary group looking at how to implement such improvements in the company and in its suppliers. Her self-confidence and communication skills improved markedly in consequence.

Georgina saw this as a valuable form of personal development. The supply chain course was instrumental in rekindling her interest in more systematic learning: 'I would like to study more, but I am not sure what to do next. I am learning to be a driving instructor and I could combine that with part-time study, possibly for pre-school teaching". She was making short-term adjustments and adapting to her changing work circumstances, while looking for alternative work.

e) Work role re-definition

Those using **re-defining** strategies are operating at the cutting edge of norms and expectations, pushing at the boundaries of expectations of employers, colleagues and others, typically negotiating, challenging and leading their peers in some respect. An example of this was a relatively young employee who nevertheless tended to know much more about all the new forms of technology than her colleagues and was recognised as the authoritative source of how to use the equipment in practice. This strategy is most viable for those who are recognised to have particular expertise, and/or formal authority and/or high social status.

Some interviewees who were ‘change agents’ had both formal responsibility and social influence and were influential in reshaping the identities of others as well as redefining their own role. Reshaping could come from ‘within’ a role and sometimes from ‘outside’ (or above). These were rare, but we did find a number of such examples.

Example of a young Turkish supervisor with highly developed communication and technical skills challenging the company stereotype of the background and age of someone in a senior supervisory position

Hasan is a ‘Meister’ in a German steel company with over 4000 employees. He is in his early thirties and of Turkish origin. His position involves supervising the four different daily shifts and leading the team of ‘shift Meisters’. He works directly for the production manager and is responsible for 70 staff. Besides the overall management of the division, his responsibilities include the co-ordination of overall shift personnel and resources. As a technical expert he supervises trouble shooting and technical problems of a new plant, with an emphasis on detailed documentation and fault analysis.

Hasan started as an apprentice in the company and then worked in maintenance. After six years he felt he could do more and that his job was not sufficiently fulfilling, and he embarked on three-year ‘craft Meister’ training, rather than the more traditional two year ‘industry Meister’. The latter was ‘what everybody does’ and he would be better qualified with a ‘craft Meister’ qualification. The three years proved to be extremely hard, because it was difficult to meet the conflicting demands of a five-shift working schedule, Meister training and a young family.

In his final year of training he applied for a Meister position for a new project, that involved the construction of a new plant. He got the job 10 months before the end of his training upon the condition that he successfully completed the training. The last ten months of his training were a real challenge. This was because he had started a new job with a high level of responsibility, the new plant required a lot of work and commitment (he often worked 10-12 hours daily), and he was in his examination period to finish his Meister qualification. However, he managed this difficult situation successfully.

The construction of the new plant required highly qualified workers and a lot of reorganisation of personnel. Hasan had great technical interest in this field and put a lot of effort into supporting work processes and structural changes. In the change process he was promoted again to technical specialist for the new plant, and is increasingly acting for the production manager. He feels he has achieved a lot. He can imagine maybe changing employer after some years, but at the moment he personally is attached to the plant that he helped to build.

Hasan is a committed and ambitious worker. Although he does not perform manual work any more, he makes sure he spends a few hours in the factory each day rather than the office. His technical expertise still provides the basis for his work, even with the managerial tasks. The biggest challenge is the management of personnel in two aspects. First, staff shortages create a lot of pressure and increase the workload for all staff as all shifts have tight staffing levels. Second, sometimes there are conflicts with other personnel because they have problems accepting him as a very young Turkish supervisor. Older employees can sometimes be very critical. On the other hand, some Turkish colleagues expect favourable treatment from him, because of their common ethnic background. In any case, he always needs to handle staffing issues and interpersonal conflicts extremely carefully. This has not yet become an issue, because the atmosphere and interaction between employees and supervisors is generally very good in his division, a factor that contributes towards his motivation and commitment.

Hasan points out that work intensification is the most obvious change in the work context. More work has to be accomplished with considerably fewer staff and work has become much more disciplined with tighter work schedules. But employees show a much more committed work attitude, because responsibilities are delegated and transferred to the individual worker, which also motivates them more.

Example of significant changes of role and personal re-definition (as a result of personal choice and as a consequence of discrimination)

Steffi works in the same steel company, but in another division to Hasan. She is in her late 20s and is currently in charge of planning the servicing and repairing of machines, a position that requires the Meister qualification (for a process or

production engineer). She is doing this job in a team of 3, each employee being responsible for a division that comprises approximately 15-20 staff working on a certain set of machines and rollers.

Steffi initially studied accountancy and secretarial work at a commercial school but did not like it, and her father who worked in the company encouraged her to apply for an apprenticeship as a material tester in the laboratory. When she did not pass the entry test the company offered her training as a skilled worker in mechanics and she accepted. At that time she was the first female engineering apprentice in the company, and she faced considerable discrimination that led her to being very close to leaving a couple of times. As an apprentice and as a skilled worker she hardly received any support from her male colleagues except for one, who encouraged her to persevere. This discriminatory situation continued after completion of her apprenticeship, but finally, one division accepted her, although it was not an area in which she trained so she had to start a completely new learning process. Working there was very hard and she was given the toughest work and was constantly discriminated against. Her immediate supervisors and colleagues hoped that she would give up. Despite her qualification she was never accepted as an equal, although she received some support from her senior manager.

Steffi put up with this situation for 4 ½ years even though it started to affect her health. Her decision to start a Meister qualification was motivated by hoping to find a way out of this discriminatory working situation. However, after completing Meister training the situation with her male colleagues escalated and on impulse she asked for work in another division where her boy friend worked. They initially recruited her into a position as ordinary mechanic. There, the working conditions were much better and the colleagues to a certain degree accepted her. After one and a half years she applied for her current job, planning repairs and maintenance of machines that required the Meister qualification and got the job.

Steffi enjoys her current job and is very satisfied with the working conditions and colleagues. She is happy with working more independently and not being directly supervised all the time. She particularly likes the challenges involved in major repair jobs that require independent organisation and complex planning and co-ordination,

where she plans and schedules her own time and work commitment. But most of her work involves the planning of the regular servicing of machines with some repair work.

When looking back Steffi feels that although the first nine years were extremely difficult and nerve wracking she was right to work through it. She feels that the harsh working climate has formed her and she is now much more self-confident and assertive. She always liked the work, even the physically very demanding jobs, and that made her stay. She is proud of her achievements, and although she sometimes misses the physical work, she enjoys working on the computer and 'assembling parts and tools in her head'.

Work forms an important part of her overall identity and links with being independent, financially self-sufficient and able to face challenges. She also values the external recognition her work brings. Steffi hopes to stay with the company until retirement. She believes her work profile may change, but is confident that her skills will be needed in future. If she decided to start a family, she would try not to be away for more than 2-3 years.

Successful 'change agent' whose role and responsibilities were re-defined

The first two examples of re-definition concerned cases where it was individual characteristics related to gender or ethnicity allied to impressive work performance that presented other workers with challenges to their ideas about who should undertake particular roles. In the following case, however, it is the performance and potential of a single individual that caused the company to reshape their role definitions so as to optimise his value to the company.

Edward is in his mid 30s. He has recently been appointed business development and personnel manger at a precision engineering company in England that has 200 employees and produces pumps for industry. He has worked for the company for 20 years since leaving school. He completed his apprenticeship, worked on machines for two years, then in planning production and was quality manager for seven years, before combining roles as business development and quality manger for a year, prior to being given his current job.

Being identified as the company 'change agent' meant he was working closely with a major customer, undergoing a mix of training and learning through working on problems throughout the supply chain network, and he started to get "more ideas of the problems and solutions of other companies". This led to swapping development ideas and he found that "personally this has given me a new lease of life and a new learning focus. It has also led to recognition in my own company… I also now have increased patience following the change agent training, better organisational skills and I am more willing to challenge fixed ideas". Edward believed this was significant in terms of his own personal development: "I will consider furthering my education. I hope to expand my business development role to director level. There have also been benefits to me in my out of work roles."

The company was going through a tough time and "there have been 25 redundancies - hence my current dual role. We could use more people in the business improvement teams. We are looking at our own suppliers too - they are at the crux of some of our own non-delivery problems. The improvements will pay for themselves if we can sustain 80 per cent Overall Equipment Efficiency." He is therefore seen as crucial in bringing about change in the company. Edward is enthusiastic and committed to his work and the company. His success has led the company to redefine his last two work roles, and the current combination of business development and personnel manager was specially designed for him.

f) Personal re-defintion

The second form of **re-definition** occurred when an individual sought to change their occupation and/or employer, because they wanted (or saw themselves forced) to change direction. Examples of this included people with a short-term attachment following or prior to a major re-definition. The example given below, however, represents not only a substantive personal re-definition, but also involves a role re-definition from an organisational perspective.

Major career change

This is an example of a woman who became very purposeful about her own career development after the age of 30. She has highly developed communication and organisational skills and challenges the company stereotype of a production manager. Her gender and lack of a technical background led her to re-define the role of production manager in an engineering company.

Sally is in her early 40s. She completed a Sports Science degree in England, worked in outdoor pursuits for a year and then chose to train as a PE teacher as she was having a problem getting a decent job, and didn't know what else to do. However, her teaching career lasted less than a year: "I discovered I didn't like kids." Next she worked in local authority leisure provision for five to six year.

She left her last post with a plan to live abroad, but this plan did not work out. She needed work, so did some temporary office work for a couple of years. One of these jobs was with a small German-owned specialist automotive components manufacturer. She started as a temporary clerical worker in 1990 and then got a permanent job in 'Customer Scheduling'. The job consisted of calculating and costing customers' requirements and keeping track of what was being produced and what had been dispatched. She took the job because she needed the work and it seemed to be a reasonable company.

Sally was eager to leave her first job there as she felt it was not utilising all her skills, and did not give her the level of responsibility which she wanted. After three years she was promoted to 'Head of Logistics' managing six clerical staff. The only company training she received was at her own instigation; she asked to go to Head Office for a two-week period to orientate to the work of the company. They gave her this time, but it was left to her to structure this period for herself. She spent the time walking around the factory and talking to people, finding out for herself what was being done and by whom and why. She found this period very informative and helpful.

She was promoted twice more: first to logistics specialist and then in 1995 to Production Manager for a major customer group with complete responsibility for resourcing the production and delivery of orders for this car manufacturer. She

manages 100 permanent, mostly full-time, staff on a three shift system, plus 7 support workers based in the office. Her work involves the ordering and control of all materials, responsibility for the production process itself, staff management and customer liaison. When the post became vacant, she had been encouraged to apply for it by her then bosses, and she got the job, although "I encountered huge difficulties as I had no knowledge of engineering production whatsoever. I knew nothing of production planning or engineering prioritising. Nothing."

Sally had had no university training relevant specifically to her new job: "My skills acquisition at this time was mainly on the job training; finding out as I went along." The company did provide training opportunities over time to help her to cope with her new responsibilities. She found the training very relevant, and it helped her to build skills to tackle her job. It was as she began to 'get a handle' on her job that she decided to do a Master's degree so as to gain a greater understanding of the underpinning of the technical work of her department. On her own initiative, she had enrolled for two evening classes - one on the Japanese view of the auto industry, the other on leadership and self-management.

Sally chose post-graduate study in engineering to get the technical underpinning she was seeking to underpin her management role in engineering: "I wanted to understand what lay beneath what I was seeing on the shop floor, and what I was controlling in my job." The company paid for the course. Much of what she learned on the course was relevant at three levels - business, technical and operational. She has now fully grown into the job as a production manager, and is well paid.

When Sally reflects on her career she says: "my career has gone every which way. It has gone differently to what might have been expected. I think there was a lot of luck involved in finding myself as a temp at my present company - being in the right place at the right time." She is very satisfied with her salary and enjoys her job, although there are frustrations linked to working in what is still very much a man's world. "It's not so much a glass ceiling as a huge steel ceiling." She felt she could have done more but for gender prejudice. Indeed the prevailing environment constrains her: "I find myself coping with it by taking on some of the male attitudes, and this makes me feel

guilty. I think I confront it with aggressive behaviour, and people don't always understand why this is happening."

Sally had never expected to enter the engineering world. "The last place I wanted to work was a factory… but I have come to realise is that it doesn't much matter what the workplace is, or where it is, or what it makes, most of the processes for getting something resourced and produced and delivered are the same." She is still looking to develop her skills: may be in assertiveness to deal with the gender problem. "Some influencing skills' training is probably what I need." She also wants to follow-up on work she did on the MSc around issues in leadership and dealing with frustration. "I need to learn how to deal with getting shouted down if I confront issues around gender discrimination."

She has been very proactive in building her career after 30: a sharp contrast with her earlier drift. However, even with restarting at thirty, she is doubtful that she would want to have missed the good times she had. Sally enjoyed her Sports Science course and being at university, and quite enjoyed some of her work in the leisure industry. She feels she has learned a lot through her various experiences, and whilst things have gone differently than she might have expected, she is where she is now… "and I'm fairly happy with that".

Implications for policy and practice

An individual's pattern of strategic action regarding work could and did change over time. An individual may become disillusioned leading to a change from identification to adjustment, or an individual may follow a strategic career path for part but not all of their working life. Reactions to work could also change in response to particular events, such as promotion or redundancy, or changes in other areas of life (birth of children, death of a spouse and so on). The identification of different forms of strategic action did help us give meaning and shape to our interviewees' career histories by outlining what we found to be relatively coherent repertoires of strategic response to the challenges of constructing work-related identities.

Occupational identity formation processes and patterns of strategic action relate to a number of issues at the level of the individual, the organisation and society as a whole. For example, there is a degree of interdependence between the structures of the labour market, the work environment and working conditions and occupational identity of employees. The product market is important here: where a sub-sector is undergoing very rapid change, especially in its product markets, then companies may wish for employees to have flexible occupational identities (FAME Consortium, 2003). In these circumstances great attention is then given to learning while working. Considerable resources and support for skill development and socialisation go into the formation of initial occupational identities (Reuling, 1998), but all parties (employee, employer and state) should recognise that the reshaping of these identities to fit changing contexts also constitutes a major task.

While continuing education and training can play a role, it is perhaps more important to support processes of learning while working (Billett, 2004). This could be achieved in formal ways through support for systems of mentoring. However, it could also be achieved through paying close attention to the composition of development teams, such that employees taking on new, and especially hybrid, roles can be given some support in moving towards full engagement with the new roles. This could be accomplished through association and working with those further on in the process. The interesting point here is that development is a process and focusing upon outcomes such as qualifications may draw attention away from the process (Brown et al., 2004). For example, in the UK it is clear that employees, especially graduates early in their career, learn by moving from company to company, and this process leads to a transfer of 'tacit knowledge' that can benefit both the employee and the companies (Mason and Wagner, 2000). 'Teaching company schemes' are another example of where there is support for a process - in this case (mainly engineering) graduates are attached to small companies to give the firms access to skills and expertise they do not normally possess. The graduate should act as a 'change agent' facilitating processes of business improvement (Senker and Senker, 1997). The key point for identity formation is that from the outset the (new) graduate learns that her or his role is about producing change - forging an identity, creating a role, helping others change - rather than fitting into a pre-ordained 'slot'.

Whilst some companies have found a high-value niche position in traditional markets, many firms still operate with fairly fixed product systems and produce to demand predictions (Doyle et al, 1992). However, even then there are pressures on employers to achieve greater flexibility in their patterns of work organisation. This means many individuals are being expected to use hybrid skill sets (Davis et al., 2000). Organisational considerations rather than occupational identities often drive the organisation of work, with particular emphasis being given to flexibility and possession of a broad set of skills and competencies (FAME consortium, 2003). One consequence is that technical skills increasingly need to be aligned with business skills and social skills, particularly for those operating in customer facing settings (Davis et al., 2000).

Changing patterns of work organisation have frequently led to increased delegation of responsibilities, greater team working and the need for learning processes, which are related to more complex thinking and to assuming a broader responsibility for the whole production process (Brown, 1998). Once again this means that technical skills need to be developed in combination with communication skills, the ability to learn independently and in teams, IT skills, business skills and abstract thinking. One implication of this for initial VET is that such skills may best be taught in combination and in context. This is one factor behind arguments for the development of complex learning environments within apprenticeship training in Germany (Achtenhagen, 2001). Elsewhere there are similar arguments on the need to focus in initial VET on the core problems of practice that have these mixes of skills embedded in authentic problems (Onstenk and Brown, 2002). Such arguments emphasise that an occupational identity needs to be forged in engagement with the complexities of practice, not something that is developed prior to such engagement. The latter approach seems to store up trouble for many individuals because of its naive model of skills transfer and development.

In the longer term, it may be that people with ‘modern’ skill sets able to undertake a range of work may look for horizontal mobility across occupations or sectors rather than vertical mobility. This can be facilitated by allowing individuals greater access to careers guidance and personal skills auditing such that they are encouraged and supported in looking across the labour market for opportunities to use their skills,

rather than necessarily remaining within particular sectors and specific patterns of thought. Overall then, if individualisation is a trend, it is important to develop guidance to support the individual in successfully responding to demands for flexibility and mobility and to enable the individual to move between occupations. The intention would be to give individuals confidence in their own abilities and to empower them to become agents of their own professional development - aspects of the French B*ilan de Compétence* may be relevant in this respect (Bjørnåvold and Brown, 2002).

The foregoing is not an argument against the initial development of a strong technical knowledge base - this remains important. Indeed it was noticeable that most employees in the German sample stated that they had no problems in keeping up with technological innovations and the required technical learning processes. This capability is surely rooted in the advanced technical skills that the German skilled worker acquires during her or his apprenticeship (Finegold and Wagner, 1999). Indeed in a slack labour market, as in Germany, employers can stipulate a formal skilled qualification even for less skilled work (Brown and Behrens, 1995). The rationale for doing so is that such employees are quick learners and are easier to motivate.

One further consideration in thinking about the identity formation processes of skilled workers in metal-working relates to the issue of career development. Should a skilled qualification be seen mainly as a final qualification or should it be regarded as a stepping stone for further development for those interested in progression. In Germany the 'Meister' position is critically discussed and in some companies already replaced where work organisation uses flatter hierarchies (Drexel et al., 2003). However, the 'Meister' qualification is generally still required in order to assume a team leading position. It also enhances chances of employment when changing employers or of keeping employment if a company sheds labour (Drexel et al., 2003). The 'Meister' qualification also entitles the skilled worker to become self-employed and to employ and train other skilled workers, and it also entitles the skilled worker to study in a related field at a technical college or even university. The latter development is now common across Europe as a qualification as a skilled worker needs to allow both further technical development and progression into higher

education. Although these routes are open, they could be more actively promoted, for example, through the provision of greater financial support for individuals following these pathways.

Employees working in the metal-working industry predominantly identify with their work tasks and related skills, the company and the professional community. However, the very strong identification and attachment of a generation ago are less common with the realisation that you are no longer effectively guaranteed a job for life. Identification with the 'output', as in the aerospace and automobile industries, or the 'process', if their work was particularly challenging and required specialised skills, could be important. Challenging work can still generate identification and commitment - significant numbers of people still want work-related identities that give them a sense of control, purpose and direction. States have traditionally been reluctant to intervene in what happens inside a company, but maybe public policy should seek to support companies that do offer challenging work.

Trade unions used to play an important role in the sector and still do to some extent. It is an interesting question the extent to which one of the key components of the 'bundles' of practices of the high-performance workplaces that European policy is so keen to promote is 'high involvement' and whether this will lead to a re-invigoration of the role of trade unions. The trade union role could also be strengthened in regard to supporting members' interest in further learning and development.

In the metal-working sector in all the four countries studied the business environment was changing rapidly and new or adapted product development was often vital. Companies were keen to discover new ways to create added value for their customers and this sometimes included sharing or selling their developing expertise. This often meant that key staff had to shift the focus of their attention. They were being expected to identify with a broader supply network rather than a single company: identifying with a mission as 'change agents' rather than an occupation or a single organisation. Preparation for, and participation in 'network change agent' roles requires considerable learning and a sophisticated framework of learning support, as it bridges individual learning, changing work cultures and organisational change (Brown et al., 2004).

One final comment is worth making in relation to the patterns of strategic action adopted by employees building work-related identities in engineering. The temptation in considering policy recommendations is to focus almost exclusively upon the requirements of organisations and the economy as a whole. However, the calls for employees to respond to demands for flexibility, mobility, and new patterns of working and learning present significant challenges for individuals. The relationship between individuals and their occupational roles could be represented in terms of their patterns of strategic action across a range of structural, cultural and social contexts. Individuals developed characteristic repertoires of strategic action and these included identification; long-term adjustment; short-term adjustment; adopting a strategic career perspective; and re-definition. What those making policy often assume is that identification and strategic career development are the states that can 'normally be expected' from those working in a particular sector. In practice, for a variety of reasons, many workers will see themselves as adjusting to work, over a shorter or longer time frame, rather than identifying with it. Any form of state-supported learning and development should therefore recognise the need to give the individual a significant 'voice' in choosing the direction in which this should go, rather than assuming development should be aligned to their current work.

We should pay particular attention to individuals who are using re-defining strategies operating at the cutting edge of norms and expectations of employers, colleagues and others, typically leading their peers in some respect. We need to know more about the process of how work-related identities are transformed and such individuals could play a key role in helping us increase that understanding. Another form of re-definition occurred when an individual sought to change their occupation and/or employer, because they wanted (or saw themselves forced) to change direction. Much more could be done to support individuals in this process, rather than regarding this more or less as an aberration. Access to impartial advice and guidance could be critical in this respect.

This idea of support for the development of individuals on their own terms is valuable in its own right. However, in engineering it also offers the prospect of building on the very positive developments associated with employee development schemes, fairly

common in the UK, open to all. In such cases workers at all levels are encouraged to study for further qualifications in their own time with employers offering some financial support. Encouragement should be given to extend support for employee development schemes more widely, because, for example, there are limited opportunities available for German workers to study for additional qualifications if they have not completed an apprenticeship. Policy-makers could look for further ways to build on the interest in 'second chance' education among existing workers when considering proposals for workforce development and opportunities to undertake a personal skills audit may be one way forward.

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