DOCUMENT RESUME

ED 424 406 CE 077 344

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TITLE Rediscovering Apprenticeship?: A Historical Approach.
PUB DATE 1997-09-00
NOTE 10p.; Paper presented at the European Conference on Educational Research (Oslo, Norway, September 24-27, 1997).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Apprenticeships; *Experiential Learning; Foreign Countries; Job Skills; Personal Narratives; Postsecondary Education; Program Effectiveness; Secondary Education; Skill Development; Vocational Education; Work Experience Programs
IDENTIFIERS England; Germany

ABSTRACT

This paper focuses on changes necessary for apprenticeship to meet society's current needs in terms of: providing an educational environment, meeting the needs of the European economies, and matching the aspirations of young people. Section 1 provides a narrative account of an apprentice working as a coach finisher in the Great Western Railway works in Swindon, England, in the 1940s. It provides a benchmark to examine how apprenticeship has changed and what has remained. As a biographical narrative, it provides more concrete evidence about three key issues that have emerged in recent debates on work-based learning: entry into communities of practice, formal and informal work organization, and the development of work process knowledge. Section 2 considers what can be learned about these issues from such a biographical narrative. It determines that the account presents a compelling narrative of an effective transition from school to work and of entrance into a community of skilled practice and maturing into the adult world. The model confirms much recent research around socialization into communities of practice and entry into communities of practice; the model represents a rich learning environment allowing the acquisition of broad-based occupational knowledge and skills. The model questions whether technological innovation demands higher skill levels and questions the efficacy of external assessment. (YLB)

Rediscovering Apprenticeship? : A Historical Approach

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Introduction

One persistent theme of debate amongst Vocational Education and Training researchers and policy makers in Europe over the past decade has been the issue of apprenticeship. Perhaps the most remarkable feature of the apprenticeship system is its survival. Dating from a pre-industrial guild system apprenticeship has constantly evolved in response to economic, political and social development and change. Furthermore just because apprenticeship does predate the industrial revolution and the formation of nation states, which led to a radical divergence in systems of vocational education and training in Europe, apprenticeship is the one system of school to work transition, socialisation and skills formation which can be found, in one form or another in almost every European country. Present discussions on apprenticeship focus on what changes are needed for apprenticeship to meet the needs of today's society, in terms of providing "an educative environment" (Enkenburg, J, 1994) in meeting the needs of the European economies and in matching the aspirations of young people.

An Account of Apprenticeship in the Great Western Railway

This short paper provides a narrative account of an apprenticeship as a coach finisher in the Great Western Railway works in Swindon, England in the 1940s. It is hoped that such an account can provide some kind of benchmark to examine how apprenticeship has changed and what has remained. Secondly because the account is narrative it is based on personal perception (rather than systems description) and may provide a richness that is missing from more analytical accounts. Narrative studies of vocational biographies may provide more concrete evidence around three of the key issues that have emerged in recent debates on work based learning: entry into communities of practice; formal and informal work organisation; the development of work process knowledge. The final section of the paper will consider what can be learnt about these issues from such a biographical narrative.

Background

The interview is with John Attwell. Born in Wales in 1927 at an early age his family emigrated 'up the Great West Road' to England to escape the economic depression which was sweeping the coal mining valleys and seek work in the railways. His father, who had previously left the coal pits to open a green grocers shop, secured a job as a storeman in the Great Western Railway. In the first half of the century the "railway was Swindon and Swindon was the railway". In a town with a population at the start of the Second World War of about 65,000, 12000 were employed in the railway. Many of the small companies

were suppliers to the railway works. Swindon was the headquarters of the pre-nationalisation Great Western Railway Company. The railway works, established in 1849 built and maintained all the GWRs locomotives and rolling stock. The huge works dominated the landscape of Swindon: "when you asked anyone where you worked they said 'inside'. The works had big walls all around, not to keep people from getting in but to stop the workers getting out. Each entrance had a gateman and to leave you had to have a pass-out slip".

Becoming an Apprentice

John Attwell left school at the age of 14 with no qualifications. Following attendance at elementary school he twice gained enough marks in the '11 plus' entrance examination for grammar school to gain an interview but twice failed. "I was a conspicuous failure". There was no vocational education in school, the curriculum consisting predominantly of the '3 Rs', reading writing and arithmetic. It was normal for those who failed to gain grammar school entry to leave school at the minimum leaving age of 14 to seek a job.

In the period prior to the 1960s school to work transition depended on class and the occupation of your parents. John Attwell's father got him a job as a 'boy' in the railway. It was normal to work for one or two years prior to entering an apprenticeship. "What job you did depended on luck. To become an office boy was considered a good number. You could roam all over the works delivering messages and no-one knew what you were doing". "Different jobs would put boys on". John Attwell was put into the No.2 Shop, the 'Old Sawmill", so called because it had been there since the railway started. His work was similar to that of an apprentice: "I started out as a wood turner operating a machine to produce handles for engines".

At the age of 16 and a half he got taken on as an apprentice Coach Finisher. "It was hard to get in as an apprentice. Tradesmen could put their eldest son into a 'first class trade', usually the one they were working in and their second son could be put in a 'second class trade'. The only other way in was the way I followed – to become a 'premium apprentice'. This meant my father had to pay £10 a year for five years – about one weeks wage a year". Trades were classified 'first' or 'second' according to complexity, custom and practice and in negotiations with and between the different the trade unions. Fitters, turners, coach finishers, boilermakers were first class; electricians, road wagon builders, plumbers and coppersmiths were all second class. First class trades received higher wage rates but the bigger difference was in social status. "It was not easy for a premium apprentice to get in as a fitter. Fitting apprenticeships were the most prized and coach fitters were a class above. In the years before the First World War coach finishers wore white aprons which they would keep on when going home through the town to show everyone their status. It was a top-notch trade. I got into the finishing shop for one reason – my father knew the foreman".

Work Organisation in the Railways

"The railway works were divided into the 'Carriage side' and the 'Loco side'. There were 26 shops in the Carriage side and the Loco side was bigger. I worked in No. 7 shop – coach finishing. There were about 100 workers in the shop, skilled finishers, with a few labourers for carrying materials. There were 14 apprentices in the shop. The body shop

built wooden teak frames for the coaches and then they would be brought into the shop where we would produce and fit all the interior woodwork. At any one time there would be 12 coaches in the shop. The shop was run by a head foreman, who had two piece work checkers under him responsible for checking the quality. Workers were organised into about half a dozen gangs, each with a chargeman who was responsible for doing the books. The foremen and chargemen were the people with influence – and we were at the mercy of which one we got. Each job had a price and each gang would undertake part of a job. If there was a dispute over which trade was responsible for a job the unions would sort it out but this was rare. It is surprising how different the trades were – everyone knew where they stood".

The system of agreed rates for different jobs and piecework payments meant that some gangs could earn more money than others could, dependent on the relationship between the chargehand and the foreman. "The top gang in No. 7 shop was Woolleys gang. Woolley was well in with the foreman and he got all the special work –the royal train, difficult or new work. Most of the systems were informal - to get on you had to have influence, to know somebody. Promotion worked in just the same way".

Learning through Work

Apprentices were moved around between the gangs, usually spending about three months with a particular gang before the foreman would move them on. "Although it was not hard and fast we were moved in a fairly organised way. Apprentices always started on No 1 gang, which was a light job based in the shop and in a siding outside the shop where we had to refurbish drop light windows. This meant removing the drop lights and the mouldings, which would be repaired inside, and then re-glazing the windows prior to fitting them back in the coach. After three months we were moved to a gang that undertook more complex work. The work got a little more complex with each move.

The chargeman for each gang was responsible for telling us what to do. Inside No. 7 shop we were mainly working on a bench. The men working on the next bench would show us how to do each job. When we were working outside the shop we were put with an individual tradesman who would teach us the job. Obviously some were better than others were".

There was no written curriculum or even a list of skills or tasks that had to be learnt. "What we learnt depended totally on what a particular shop did. In fact our work was similar to a cabinetmaker. We were expected to achieve a tip-top finish. When we were working on the drop lights we would spend a whole day just sand papering – and then often the chargehand would make us do them all again. Time was not a problem – the question was quality".

There were no written plans or procedures – learning was from practice. "Later I was sent 'up the line' to work outside the shop with the door gang. That was where I got my first interest in crossword puzzles. The tradesman was called Ted Quinn". The door gang was responsible for hanging the interior doors in the carriages. "There is an art to hanging doors and making them slide – a knack to it. We had to screw a three quarter inch rod with brackets above the door. The doors hang and rolled along the rod on wheels. If they were too high they would lift off the bottom guide rail, if they were too low they would

stick or come off the rollers. Ted Quinn would get it right every time. He was fast enough that he would do a little work, then settle back to his crossword puzzles. If an apprentice mastered the skill he would be kept on the gang but some could never get the knack of it".

New work, rather than repair and renovation, was highly regarded, mainly because it paid more. One of the best jobs was fitting the interior of compartments. This involved erecting the seats, interior panelling, mirrors, and putting up the net and blinds. Two tradesmen would aim to complete one compartment each day. "Apprentices could be seen as a hindrance in this work – if you were not good you could slow the job down." There were a number of specific skills to be mastered: "The best tradesman was a Hector Neaves. Everyone knew him as 'one cut Neaves'. He would look at something and then cut a piece of wood which would fit first time nine times out of ten".

There were no formal tests or assessment, neither was there any requirement to attend school. Those that did go to night-school could study for a National Diploma. This offered the opportunity on completion of apprenticeship to transfer to the Drawing Office, a position that was highly paid and the highest status. Many of the workers in the Drawing Office had passed their 11 plus and stayed on at school until the age of 16 prior to entering an apprenticeship. Few working class students went on to university. Other 'grammar school boys' joined the railway as clerks, a position which paid better and where they could "wear clean clothes". Clerks also worked only 44 hours a week compared with 50 hours for tradesmen and labourers.

Becoming a Tradesman and getting a job

At the end of five years the foreman decided that John Attwell had 'proved satisfactory' and he became recognised as a skilled tradesman. In fact everybody 'passed'. However the reputation of the standard of your work had a major influence on finding work and then on what gang you were placed with after completing your apprenticeship: "there was not enough good work to go round". Labour was scarce at this time due to the war so tradesmen were retained. Prior to the war it was standard practice for everyone to be laid off once they reached the age of 21. Many found work in the fast expanding Oxford Motor Works, some 50 kilometres away, but the car factories had a 'bad reputation' as the work was on production lines. Newly qualified tradesmen would work in the car factories until trade in the railway works picked up when they were "sent for". Great Western Railway apprenticeships were "highly regarded all over the world – especially the fitters and the first class trades". Many tradesmen went to work on the railways in India, Australia, New Zealand and South Africa.

John Attwell got a job refitting and renovating carriages in an area of the works known as 'the Klondike', as it had been built at the time of the 1898 Klondike gold rush. "I was lucky because I knew people – I was a member of the first aid team". Within a year he was allocated his first apprentice to work for him.

Connections to the present discussions

What can be learnt from this account? What are the strengths of the 'GWR' model of apprenticeship? What changes have taken place in technology and work organisation

since the 1940s and what implications do they have for the provision of apprenticeship today?

Communities of Practice

A number of writers (Brown, 1996; Ellström, 1997) have pointed to the importance of entry into a community of practice within the process of gaining the status of an experienced, skilled worker. This is based on the following ideas:

- That learning is a relational social process;
- That processes of becoming skilled take place within a broader process of identity formation;
- That recognition of significant achievement (and attainment of the status of experienced practitioner) is itself a socially mediated (or contested) process, dependent on the recognition of others and a sense of self-worth.

The process of entry into community of practice appears as one of the central features of the GWR apprenticeship model of the 1940s. In a town dominated by one industry the achievement of skilled status not only awarded occupational status and identity in the workplace but social status within the community. Skills were progressively acquired at the same time as occupational and social identity was advanced through the change from a 'boy' to 'apprentice' to 'tradesman'. The tasks that an apprentice was allowed to undertake as a member of a particular gang, and the learning which took place, were dependent on their skills and ability to contribute to the work of that gang.

Work Based Learning

Learning was authentic and totally situated in the work place. Despite the lack of a formal curriculum framework tasks were graded and progressive both through an ordering of progression and movement from one gang to another and through a progression from simple (and often repetitive) tasks to gradually more complex work. There were no formal teachers or 'Meisters' as such. But there was a social acceptance that an important role for a tradesman was to initiate apprentices into the craft, even where this process might hinder the speed of work. Clearly this involved not only the passing on of formal skills, and of tacit knowledge, but social initiation into the rules of the community.

Work Process Knowledge

The model was particularly effective in developing work process knowledge through the passing on of implicit knowledge from one generation to another. There were no written manuals or textbooks. Work teams themselves developed methods for solving the problems those particular tasks would bring with them. The knowledge of how to undertake these processes was passed on from team to team and from workers to apprentices. Individual skills were linked to carrying out particular procedures within an authentic and real work environment. Such a model encouraged the development of innovation, through the application of knowledge and skills. Incentives for innovation were making the job easier and allowing more 'free time', and increasing bonus payments through the piecework system.

Assessment

There was no formal assessment. The recognition of craftsman status was peer group recognition cognoscente of becoming 'time served', in other words having spent sufficient time within the community to having fully absorbed both the skills of that community and its social rules. Formal, or cognitive, learning was limited to the particular knowledge required to undertake the work of a tradesman in a particular work context. The lack of written plans meant reduced the formal knowledge requirements. However there was clearly some considerable need for what would today be known as core skills or key qualifications. The use of number and measuring was central to the work of a coach finisher, as was the ability to accurately estimate. The learning of these skills was totally integrated in the total learning process, assessment being on the ability to carry out the skilled work that involved these tasks, rather than as a separate element.

Work Organisation

The model of apprenticeship and of learning was heavily dependent on the form of work organisation. The hierarchy was limited to two foremen, two checkmen per shop and several chargemen per gang. Work was organised between teams with the foreman responsible for the allocation of work to each gang and the chargemen responsible for the work carried out by the gang. The range of tasks carried out by each gang seems to have been relatively broad. Within this form of work organisation there was the opportunity for an apprentice to undertake the full range of work tasks needed to achieve tradesman status. It is also important to note the very high percentage of skilled workers with the shop, providing a ready pool of potential 'teachers' and a strong sense of occupational cohesion. Such a form of work organisation stood in stark contract to the expanding car factories whose Tayloristic work organisation led to an unpopular reputation amongst workers who had acquired their occupational identity in the railway works.

Issues of Debate

The account presents a compelling narrative of an effective transition from school to work and of entrance into a community of skilled practice and maturing into the adult world. But is such a model still relevant today. If not what changes have taken place and how does the apprenticeship model of the 1940s need to be modernised to fit the needs of the European economy today and present social norms and values.

Firstly it would appear that the model confirms much of the recent research around socialisation into communities of practice and entry into communities of practice. It also reinforces the ideas of the importance of tacit knowledge in the social process of innovation and how such implicit knowledge is acquired. The model that is presented is of a rich learning environment and allowing the acquisition of broad-based occupational knowledge and skills. It also illustrates the potential of semi autonomous work teams for work-based learning and innovation and quality.

It would be interesting to further research as to why the Great Western Railway preserved a largely pre-Taylorist organisation of production at a time when most large industry was rapidly moving to production line models and also to look at practice in the industry today. In this context it should be noted that the Swindon Railway works went into rapid

economic decline in the 1960s and the site today has recently been transformed into a heritage area containing a huge retail shopping centre.

However there must be questions as to whether technological innovation and the rapid changes in production today demand a higher level of formal knowledge and cognitive skills. The work undertaken in the railway utilised high skills in traditional trades and occupations – "cabinet making". It may be questioned whether the rapid growth in information and communication technologies and in mechanisation have rendered a necessity for a broader base of formal knowledge, illustrated from the car trade in the vast increase in the size of service manuals for servicing automobiles in the same period (Rauner, 1996). However the general response to such change in requiring both a higher level of (usually school based) formal academic and vocational knowledge along with the stipulation of abstracted core skills or key qualifications may not be so effective in the passing on and development of work process skills and tacit knowledge.

The model also questions the efficacy of the present obsession with external assessment for providing quality control, ensuring recognition and providing for transferability. Assessment and quality control were based on membership of a community and occupational identity based on possession of skills leading to social status. In other words assessment was a process of passage into a new peer group. In the UK context the weakening of occupational identity in the last 40 years may have rendered this process impossible today. The importance of time serving should be noted. Time serving not only mediated entry into a social community of practice, and marked a rite of passage, but allowed a substantial and extended period of time for the development of skills and implicit knowledge.

Despite the lack of formal assessment the apprenticeship had a high degree of transferability in terms of recognition. GWR qualified craftsmen could obtain employment all over the world and in new industries as well as in traditionally organised craft trades. This raises three issues. One is the credibility of the training endowed by the company in which it took place. There is evidence that in the UK even with national standards and standardised assessment the credibility of the award still depends to some degree on the context in which the learning took place (Unwin and Wellington, 1995). The second is as to whether transferability and recognition were predicated on achievement of a socially understood and relatively unchanging set of traditional skills and knowledge. It may be that the contexts in which these skills were employed had a substantial degree of similarity, even between industries and thus there was little 'wasted learning'. The third is a general social consensus in the UK at that period in the personal qualities which successful achievement of apprenticeship endowed.

It is not the intention of this paper to explore the wider sociological questions that are posed. But a number of questions are unavoidable within the whole debate on apprenticeship. The traditional social processes of school to work transition have changed, as has the social prestige of craft status within working class society (Ainley, 1988). This is not intended to imply that class and family background are not still of prime importance in determining future career options (see for example, Evans and Heinz, 1994). However the social forms of agency in this process have become less transparent, along with an increased uncertainty over future employment. At the same time 'modern apprenticeship' has generally introduced some ideas of access, choice or

merit in entry (although it is interesting to note that when the author studied apprenticeship in the Valencia Ford factory in 1993 entry was still dependent on a parent being employed at the plant; Attwell, 1993). This has of course been accompanied by increasing mobility in seeking education and training and increased working class participation in higher education. In the 1940s there were no female apprentices in the railway works. Women were employed, primarily as clerks, for which there was no apprenticeship; pay for women was lower than for men, even for the same work. Recent studies (Unwin and Wellington, 1995) have indicated there are still substantial barriers for access for women into apprenticeship in traditionally male areas of employment.

Final Thoughts

This study would seem to confirm the usefulness of vocational biographies and oral history in studying the development of vocational education and training and in particular examining the process of learning occupational and work based skills and knowledge. One of the difficulties in comparing national vocational and education training systems in reducing the variables to allow comparisons to be analysed. The broad similarity of apprenticeship systems renders the subject more fungible and therefore provides a base for survey and analysis. The strength of a study based on perceived experience is that is allows access to questions of informal learning and work organisation and the development of tacit knowledge. These issues have proved difficult to grasp from a more abstracted starting point. Further methodological approaches such as the analysis of witting and unwitting statements may bring further light to bare on the subject. An example from the account above is when John Attwell talks of the enjoyment the craftsmen had in doing crosswords. Not only does this reveal the relative autonomy they had in organising their work but also suggests relatively high levels of literacy of workers in the trade. A series of studies of the experience of apprenticeship at various periods in the same industry could provide useful evidence on the evolution of work, technology and skills and the relation between work and learning. Similarly there could be value in a comparative study in the same trade but in different industries. As in many studies in the field of vocational education and training this particular account suggests there is much to be gained by bringing the viewpoint and methodological approaches of different disciplines together, and the need for more still more research to be undertaken.

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