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Towards a history of vocational education and training (VET) in Europe in a comparative perspective

Proceedings of the first international conference
October 2002, Florence
Volume I

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The rise of national VET systems in a comparative perspective

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Preface

There are few long-term studies in which the development of vocational education and training (VET) is placed in a larger societal framework. Those that do exist tend to focus on the development in only one country. Consequently, there is limited understanding of why VET has evolved differently in countries with similar economic and social development. In Western Europe the emergence of EC/EU social policies has had further consequences for VET in Member States, while, at the same time, existing education and training systems have presumably influenced the shaping of EC/EU policies.

In January 2000, the European Centre for the Development of Vocational Training (Cedefop) launched the project *A European history of vocational education and training*. The project is based on the understanding that knowledge of historical development is necessary for a solid comprehension and interpretation of contemporary events and processes. The purpose of the project is to promote better understanding of present-day VET by making reference to the historical development at national and intra-national levels. The project also sheds light on the influence of VET on European integration, and aims to encourage future research in these areas.

In October 2002 the University of Florence and the European University Institute organised, under the aegis of Cedefop, the first international conference on the *History of vocational education and training in Europe in a comparative perspective*. The first session of that conference dealt with the development of VET systems in one or several European countries. The second session examined the role of VET in EC/EU social policy was mainly from a historical viewpoint.

This publication provides the conference proceedings in two volumes. It also includes papers which, for time reasons, were not presented at the conference. The articles form the basis of a valuable body of knowledge which Cedefop hopes to build on in the future by encouraging further comparative research into the history of VET in Europe, including other countries to complete the picture.

Stavros Stavrou

Deputy Director

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Executive summary

Cedefop's mission is to help policy-makers and practitioners in the European Commission, Member States and social partner organisations across Europe to make informed choices about vocational training policy. Concentrated efforts are made to provide stakeholders with relevant, up-to-date information and provide assistance, through the knowledge management system, on issues of mobility, quality and transparency of qualifications. Cedefop also supports deeper understanding of current changes in vocational education and training (VET) by encouraging and supporting theoretical studies which are disseminated through its VET research publications.

The VET history project should be seen in this context. Depositing Cedefop's archives at the European University Institute of Florence University was the occasion for gathering researchers to give presentations on different aspects of VET in Europe at the First international conference on the history of VET in Europe. The presentations concentrated on two main issues: the rise of national VET systems in a comparative view and the developments of VET in the context of the construction of the EC/EU and the role of Cedefop.

This volume contains contributions from the first day of the conference on the rise of national VET-systems in a comparative view. These do not pretend to give an exhaustive presentation of VET in Europe, but investigate certain aspects of how, from a relatively common apprenticeship system rooted in the guilds, a number of different forms and organisational structures of VET came into being, even in countries with comparable economic and social development.

A number of national and comparative aspects are covered, such as a tentative 'typology' of European VET systems with its three main representations: the liberal market economy model (in England), the state regulated bureaucratic model (in France), and the dual-corporatist model (in Germany). None of these models exists in a pure form, and though they are all subject to change because of economic, social, and political development, a certain stability remains, as shown by the article dealing with the structural differences between the development of apprenticeship systems in England and in Germany due to different roles assumed by the state. An analysis of apprenticeship strikes in British metalworking between 1919 and 1965 shows the results of the reluctance of state interference.

In contrast, the article on the development of the provision of schools and colleges for technical and vocational education in France from the French Revolution to the Fifth Republic shows the strong central influence of the state in a fragile alliance with the employers. A comparison between the structures of VET in the Netherlands and in Germany raises the question of why full-time school VET became the dominant form in the Netherlands whereas occupational and in-company training established itself as the main form of VET in Germany, not only covering artisanry, but also the commercial and the technical fields (i.e. industry).

Multiple forms of VET in Switzerland have given rise to a potential for innovation and dynamism in the discussion about learning in school and/or in the workplace; these might inspire development in other European countries; the tendency being improvement rather than change. The article on the link between continuing education as liberal education and 'enlightenment' and VET in Finland, with a sideways look at development in other Nordic countries and Germany, gives another aspect to the idea of 'VET models'.

Two 'transnational VET models' are presented. First is the production school concept, developed from the French *Écoles d'Arts et Métiers*, combining theory and practice, learning and work, production and sales, and still existing in various forms, in various countries and with various pedagogical aims. This is followed by the concept of *Lehrgangsausbildung*, or the 'sequential method', a systematic industry-based training method widespread in the 20th century. The volume ends with a presentation of 300 years of VET in Russia.

The contributions mentioned above do not pretend to offer an absolute truth. They present a few highlights, and are far from a giving a comprehensive view of the many aspects of VET in Europe. Many aspects are not covered, such as the role of the organisation of labour markets in relation to VET, and the role of social partners in various countries and at various stages of the development of VET, and of institutions and training providers.

We hope that the publication of the proceedings of the First international conference on the history of VET in a comparative perspective will give rise to further investigations, debate, and articles.

Mette Beyer Paulsen

1. Introduction

Georg Hanf

Any endeavour to create a common vocational education and training (VET) policy meets resistance. Why is any attempt to change things, even under the most highly decentralised methods of coordination, still full of confusion and conflict? This is not just a matter of competing sovereignties. Even when politicians from different countries want to cooperate, want to achieve common objectives, they are not free to make decisions. They too are bound to deep-rooted traditions, mentalities and sociopolitical structures.

An analysis on *Convergence and divergence in European education and training systems* (Green et al., 1999) issued by the European Commission some years ago concludes that European education systems would have historically shown marked structural and developmental differences, influenced not least by their different national political systems and modes of regulation, their different economic and labour-market structures and their different cultural and knowledge traditions. 'National and historical factors continue to play a major role' (ibid., p. viii). Education systems are as varied as the histories of European States. They have inscribed within them the various different paths to modernisation taken by the different States. Most significantly, it is the divergences in national labour markets and forms of labour-market regulation that ensure the continuing particularity of education and training systems. Each of the national systems remains unique. 'But at the same time they show distinct regional affinities, most notably in the German-speaking States, Mediterranean States and Nordic States, and these geo-political patterns clearly warrant further investigation.' (ibid., p. 235).

Research tells us about path dependency of institutional development. Once on a certain track, systems/institutions are bound to move on; they are shored up by positive feedback. As Huber and Stephens pointed out, 'analyses based on small slices of time are likely to miss entirely the way in which the past has shaped how the main actors define their interests and what strategies are realistically available to them at any particular juncture' (Huber and Stephens, 2001, p. 33).

Since many of the formal institutions we consider will have survived for some time, analysis of institutional design will have to be complemented by greater attention to questions of institutional development, something that suggests the need to incorporate a somewhat stronger temporal dimension. One can only make sense of the form and functions these institutions have taken by viewing them in the context of a larger temporal framework that includes the sequences of events and processes that shaped their development over time: Looking back 500 years we see common origins in the old European cities and guilds; 200 years ago we see the crisis of the traditional structures in the wake of the Industrial Revolution and 100 years back we see the divergent national systems taking shape.

The choice of Florence for the first European conference on the history of VET in a comparative perspective was determined by the fact that the archives of the European Communities are there and it hosts the European University Institute. At the same time this magnificent city represents old Europe, its history. The architecture, which has survived for centuries, still demonstrates the skills of the crafts 500 years ago. The city is also full of symbols of the social organisation of work and life. The rise of modern big industry and of nation-States clashed with this tradition of cities and guilds. For the nation-States, the education system was the modern instrument to develop the competences of citizens in a wider sense, including work related competences.

In the 18th and 19th century we find the origin of a competitive relationship between two types of competence reproduction: safeguarding learning through practical experience and the imitation of the master monitored by the guilds, on the one hand, and the new type organised in schools based on the principle of a written prescription of work capacity. The competition of these two principles, also referred to as the modernisation process in competence reproduction, shows different patterns in the different countries: dissolution, assimilation and transformation of the old.

The conference wanted to bring together speakers representing the different groups of systems: the Anglo-Saxon, the German, the Mediterranean and the Nordic systems. Since we wanted to take a wider perspective historically and geographically than the present day EU countries, we also included Russia and Switzerland. Both had long-standing relations and communications with the other European countries before communism and beyond total neutrality. The history of VET systems is the history of divergence. But on the level of teaching and learning there was still a lot in common. This is why we also included two articles on transnational histories: one on the production-school concept, which originated in France and was adapted by a number of countries; the other on the 'sequential method', a didactical tool that was created in Russia and from there spread throughout the European continent and further.

The conference and this reader on history has a history itself: there is a tradition of writing the history of VET where VET has developed relatively independently of both education and employment. The consequent heightened interest in the history of VET was manifested in a series of five conferences in Germany in the 1980s and 1990s. The relative number of German papers in this volume can be explained by this historic occurrence. Today it no longer makes any sense to write national histories; we have reached the point where we have to re-write history in a (comparative) European perspective.

In his reflections on a possible theoretical framework for analysing the historical development of European VET systems, Wolf-Dietrich Greinert takes a three-step approach searching for common principles of the various systems. VET is first embedded in national work cultures which manifest in labour law. It is the work cultures which then form the basis of specific VET regimes. Work cultures and VET regimes, in turn, come with leading ideas, which legitimatise a certain didactic orientation. Based on a diachronic analysis from the Industrial

Revolution onwards, three general types of VET systems are identified. In Type A, the economy takes priority from a work culture perspective; the training model is regulated primarily by market forces. At the learning level, the functional needs of the company or the actual job direct the didactic principle. In Type B, politics take priority from a work culture perspective; the training model is primarily regulated by bureaucratic control. At the learning level, academic principle is the main didactic tenet. In Type C, society takes priority from a work culture perspective. The training model is primarily regulated by dual control, i.e. a combination of market and bureaucracy. At the learning level, the vocational principle is the determining didactic orientation. The structures and control models with origins in the Industrial Revolution display remarkable endurance.

This is demonstrated with a comparative view of the history of VET in England and Germany by Thomas Deissinger. Whereas, in Germany, the State, at the end of the 19th century, took an active role in vocational training by establishing a legal framework, in England, due to the successes of industrialisation achieved without any significant contribution from education, it was a common belief that preparation for the world of work was best given on the job rather than in formal education. The evolution of modern VET in England may be seen as substantially shaped by the way the first industrial nation 'reacted' to the Industrial Revolution. This 'reaction' in the 19th century predetermined the path for vocational training into the 20th:

(a) by discontinuity of those principles supporting the ancient apprenticeship system and its social framework;

(b) by a continuity of preindustrial social theory which clearly impeded the case for educational expansion;

(c) by an insufficient platform provided for welfare and social State activities to establish education for the people;

(d) by an obvious disjunction between educational development and industrial and economic achievement.

How State reluctance influenced the history of VET in the UK is demonstrated by Paul Ryan who has undertaken in-depth research into apprenticeship strikes. In his view an interesting attribute of the modern histories of both apprenticeship and industrial relations in the UK is the marked propensity of metalworking apprentices to take industrial action. Between 1910 and 1965 they launched a series of strikes. A range of indirect evidence suggests that apprentice strikes had serious effects on employers, allowing them to contribute to a sea change in wage structure during the period that in turn encouraged the subsequent decline of apprenticeship activity. Apprentice strikes also contributed to the erosion of the already attenuated distinction, both *de jure* and *de facto*, between apprenticeship and regular employment. The embedding of apprenticeship in industrial relations that occurred during the period owed much to apprentice activism. The casualty was any prospect for apprenticeship to develop as part of VET, as occurred in central parts of continental Europe.

A feature of the system of vocational training in France is the extent to which that training is provided in State school and colleges and not in the workplace. In his article, Vincent Troger outlines the main trends in the history of vocational training from the French Revolution up to the major reforms of the 1960s. The French suppression of forms of effective inter-mediation between citizen and State represents the most extreme expression of the pan-European confrontation with the dichotomy between nation-States and traditional, occupational fraternities during the Industrial Revolution. During the 19th century and up to the First World War, there were similar developments in Germany and France. But as industry did not organise its own interests in VET and the unions did not play an active role in France, the State constantly strengthened the forms of centralised control and standardisation. The policy of modernisation launched by de Gaulle included greater public investment in human capital and a booster for universities and schools. Thus, France turned back to its path taken during the French Revolution.

In their historical-comparative perspective on the Netherlands and Germany, Dietmar Frommberger and Holger Reinisch raise two questions:

(a) why did occupational and in-company training establish itself as the training form in Germany beyond the realm of artisanry to include the technical and commercial fields and why did this form of standardised workplace training not become universal in the Netherlands?

(b) why did full-time school based VET not attain a dominant role in Germany as it did in the Netherlands and most other European countries?

It is obvious that, in the Netherlands, there was no industry taking the initiative for its own training as in Germany. But a clear answer is still missing because of a paucity of relevant source analysis pertaining to training strategies for the Netherlands in a historical perspective.

Switzerland tends to be left on the sidelines in the international debate on educational reform and rarely receives a mention in comparative international studies carried out in vocational training research. There are a number of reasons for this. One is that Switzerland is not part of the EU; another is that, so far, the presentation of Swiss VET to the public abroad has been little more than rudimentary. In his brief historical account, Philipp Gonon recalls the origins of an antagonistic debate on the question, should people learn at the actual workplace or should they learn everything they need to know at school? In the18th century, in the age of enlightenment, industriousness was a political and economic reform project of to be carried out in schools. In the 19th century, other reformers brought educational standards into the workplace to help apprentices acquire practical skills and general knowledge. It was the repeated movement between school and workplace that ultimately led to realisation of the potential of a third learning environment which is at the core of the most recent reform.

The emergence and transformation of national systems can be taken as outcomes of competition between cultural programmes of VET, carried out by individual, collective and meta-collective actors striving for certain subnational, national and supra-national aims. The

cultural approach propagated by Anja Heikkinen, conceives education as joint constitutor of culture as projects or programmes at personal, collective and at societal levels. Through discussion on continuing education in Finland, Nordic countries and Germany the historicisation and contextualisation of models of VET is suggested. In most European reflections on education only polarisation between academic and vocational forms of education are discussed. The Nordic history of education, however, reminds us of the importance of a more complex view, where different forms of education are considered from the perspective of individual and collective growth processes, in relation to their political functions. In the Finnish context, a basic form of education emerged as popular or citizenship education, a holistic concept which in the 20th century has been altered by encyclopaedic education and specialist training.

Contrasting with the development of divergence of VET systems, Johannes Meyser sets out a pedagogical concept which spread across borders. The production-school principle combines learning and work, theory and practice, qualifications and sales-oriented production in a targeted manner. It has a long, if interrupted, tradition, but is still very modern. This training precept originated in Europe and was first established in France during the 18th century French schools were extremely influential during the establishment of vocational training institutions in Europe. Similar production schools were founded in virtually every country during the 19th century. In the early 20th century they lost their prestige in some countries and were, in part, replaced by other environments of skilled worker training. Towards the end of the century, however, the production-school model saw something of a revival and is to this day an applied form of vocational training in many countries.

The second example of a trans-European concept in the times of divergence, presented by Günther Wiemann, is the 'sequential method', created in 1868 by the Director of the Moscow Imperial Technical School, Victor Karlowich Della-Vos. In 1873 this learning model was presented at the World Exhibition in Vienna and soon spread throughout Europe's training centres. A century later, in 1973, the German Federal Institute for Vocational Training launched its first elementary metal training course, which was structured exactly along the lines of this pattern. In 2003, 135 years later, several hundred courses across Europe evidently adhere to the principles expounded in 1868. Undoubtedly, the 'training course' is the most successful and effective learning system in the short history of industrial vocational training. Its didactic concept has merited an unprecedented dissemination across all European industrial societies. Millions of young people have set out on their career paths through this laborious 'training course' and have thus made a considerable contribution to the quality of European industrial products.

Through the centuries, before this didactic tool was invented in Russia, professional knowledge was gathered through the journeys of journeymen to other countries everywhere in Europe. We finish our *tour d'horizon* turning back to these common origins. We include a contribution by the director of the Museum on the history of VET in Moscow, Irina Stanislawowna Derivianko who reminds us of the journeys of Peter the Great and his entourage. Many of the members of the Grand Embassy on these journeys underwent training

in various professions. Peter himself studied navigation theory abroad as well as mathematics and geometry, and also gained experience working as a carpenter in shipyards in Zaandam, the Netherlands. On his return to Russia he opened the School of Mathematics and Navigation in Moscow (1701), which became the first of many vocational schools at higher, secondary and elementary levels to be established in the centuries after.

Europe has set itself the goal of becoming a world reference for education and training by 2010. To achieve this ambitious goal implies a far greater degree of convergence. Since the Treaty of Rome, the nation-States have been working towards the development of a common policy for VET, giving the latter a major role to play in the vision of a Social Europe (the sister volume of this publication focuses on this part of history). Today we are united by common issues and priorities as well as values. But there still are different conditions and means to achieve these. What is the whole? Is it just the sum of the all the single systems or is it more? And where are we going to, together? We started on different tracks but is there a station at which to stop and connect the trains? Who is the points-man setting the course and in what direction? Do we have a mutual economic, social, educational perspective? The answers cannot be forecast from history but no common policy will succeed without reflecting on the past.

There is a role for VET historians, too, as Anja Heikkinen has pointed out: by recognising and making visible certain entities, phenomena, changes and continuities as being relevant in VET, researchers assist in defining work and education at subnational, national and supranational levels. Traditionally, history and education have been the most nationalist among disciplines, promoting building of the nation-States, national cultures and industries. In the making of the European economic, educational and research area, they may promote national concepts to influence the building of Europe. But they may also work in favour of an intelligent coupling of different systems, designing the schedule which allows all trains to arrive at a common destination.

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2. European vocational training systems: the theoretical context of historical development

Wolf-Dietrich Greinert

'The transition from school to the world of work is very different in Germany and Britain. The contrast between these two countries is probably the most marked in Europe, although the British seem to feel that all mainland countries south of Scandinavia use a watered-down version of the German system or a variation on its theme. We consider that Germany has the most pronounced version of what we would call the typical continental model.'

These comments by Liverpool sociologist Ken Roberts (2000; p. 65 et seq.) may not be objective, but we believe that their directness demonstrates the difficulty even experts have in portraying the European vocational training landscape in a way that is easy to comprehend. If this applies to the variety of existing training systems, how much more difficult must it be to reduce the highly complex historical development of these qualification systems in order to extract common elements to which experts from various disciplines can relate. The European Centre for the Development of Vocational Training (Cedefop) has risen to the challenge in its project on the History of vocational education and training in Europe in a comparative perspective ([1]).

2.1. What makes VET a 'system'?

Historian Hermann Heimpel claims that what makes Europe so European is that its history is the history of nations. However, this perception of nations as the building blocks of European history acknowledges that they not only established themselves during their gradual development processes but also depended on their relationships with one another as productive partners and competitors (Zernack, 1994; p. 17). Numerous factors shape relationships between nations. These include common borders and the exchange of goods. Certain international and universal historical trends are particularly decisive. The most influential factor governing the genesis of vocational training systems for the working masses is undoubtedly the Industrial Revolution or the general industrialisation of the European nations. It not only triggered far-reaching economic and technological change, but also profoundly altered the structure of society, social interaction, lifestyles, political systems, types of settlement and landscapes. In the wake of the revolution, the system of 'replenishing human resources' underwent radical restructuring in all European countries.

([1]) Available from Internet: http://history.cedefop.eu.int [cited 14.10.2003]

Paradoxically, the process of industrialisation in Europe did not produce one uniform vocational training model. On the contrary, it more or less destroyed the roughly homogeneous craft-trade-based vocational training methods which had established themselves over the centuries, and replaced them with a myriad of 'modern' education systems, which at first glance seem to have very little in common. Given their diversity, however, it would be wise to be careful with the term 'vocational education and training system'. Walter Georg rightly pointed out that academic system theory can only refer to a system of vocational training if the practice in question 'has become independent and has permanently established itself as a selective communication network in the process of social differentiation of specific functional subsystems. This requires a large degree of self-referential unity and disassociation from internal social structures' (Georg, 1997; p. 159).

Georg states that these kinds of independent vocational training systems, characterised by self-referential internal structures and processing mechanisms, exist purely in German-speaking countries under the name 'dual system'. In other countries, both school-based educational methods and forms of in-company initial and continuing training are founded on the logical processes of different social subsystems. In the case of school-based vocational training it is the meritocratic logic of general education; in the case of in-company training it is the logic of company-based production and work organisation. Georg concludes: 'The unique German approach of maintaining a self-referential vocational training system independent of schools and businesses makes any attempt to compare it with other "systems" seem like an ethnocentric misunderstanding, because usually no common means for comparison can be found' (Georg, 1997; p. 159).

Georg believes that the model for explaining specific national differences in employment training for the masses must be expanded to incorporate the constellations of the prevailing cultural and functional-structural relations within a society. A society's values, norms, attitudes, convictions and ideals shape education systems, work organisation and occupational relationships as well as the more or less stable interaction between specific national employment training and other social subsystems such as general education and the various employment system paradigms.

If we take the views raised above into account, we can extend or refine the criteria for international comparisons of vocational training so that we can distinguish clearly between 'vocational training systems' and 'vocational training models'. The term 'system' should only apply to genuinely independent, self-referential vocational training models. Additionally, a category super-ordinate to vocational education and training is necessary to define operational structural patterns and interactions between the social subsystems relevant to vocational education and training. We propose the term 'work culture'.

2.2. Three work cultures

However, the concept of work culture encompasses a series of methodological problems. How can we classify the internal correlation between these national work cultures appropriately? Which principles of orientation and which paradigms are decisive? How can we avoid oversimplified idiosyncratic interpretations or biased paradigms?

A study by Bercusson, Mückenberger and Supiot seems to present a viable way of narrowing down this highly complex topic by attempting to establish a methodical approach to the comparison of labour law and work cultures (Mückenberger, 1998). They used a double testing procedure to examine selected fields in Britain, France and Germany. One aim was to discover what ideas of waged employment lawyers from the three countries have which influence their actions and decisions (work culture in day-to-day legal routine). Another was to learn what ideas and experiences representatives of both sides of industry in the cited countries have of the law in general and of labour law in particular.

The study (Bercusson et al., 1992) presented of three paradigmatic contexts incorporating the labour legislation of the three countries. Each paradigm lends shape and form to the prevailing legislation it describes (Mückenberger, 1998; p. 37 et seq.):

(a) 'In Britain the production relationship is regarded as no more than a market process in which the market participants are members of society, i.e. employees, employers and partners to collective agreement. The image of law is correspondingly negative, characterised by absenteeism, or non-intervention in the market process. "Rule of law, not of men" is the appropriate paradigm.'

(b) 'In France even the production relationship is seen as a political entity. The players involved are the state and its executors, known as *inspecteurs de travail*. This emphasis on the political aspect finds expression in the recognition of the *ordre public social*. This is a regulation giving central control of working life to the state (not to the market as in Britain or to the interplay between private autonomy and the legal system as in Germany). The paradigmatic background to this Republican version is the *majesté de la Loi*, as the greatest achievement of the *grande révolution*.'

(c) 'In Germany the production relationship is regarded as a kind of community which has a tradition of reciprocal responsibility and consideration of the whole. The rules of this social community are, as in Britain, seldom imposed directly by politicians. The social partners themselves set, elaborate and correct them to some degree. However, they play a more active role than social partners in Britain, following a cautious, specific case-related process of adaptation, which arises from interaction between judges and lawyers. The paradigms of the "civil constitutional state", private autonomy and supervision by the law characterise this.'

The three countries also have different priorities in the area of industrial relations and labour law. In England there is a primacy of economics, in France a primacy of politics and in

Germany a primacy of society. The authors of the above-mentioned study feel that these also encompass the countries' differing priorities of 'security' and 'freedom'. Social security was developed earlier and more completely in Germany than in France and Britain. However, it is accompanied by a loss of freedom. In France the right of political articulation, action and organisation, even militancy, have priority over social security. In Britain freedom also takes precedence over security, not in the same way as in France, but in the form of market activity and collective bargaining. According to the study, in France freedom is the domain of politics. Freedom is achieved within (and through) the state. In Britain the issue of freedom from the state dominates (Mückenberger, 1998; p. 38).

This model illustrates that work culture, like culture in general, actually conveys a 'vague idea in a consistent context' (Georg, 1997; p. 161). The methods for approaching the specific national differences have certainly not been exhausted in the above discussion. However, we can already deduce something that culture-oriented investigations have confirmed as a general tendency: the incredible persistence of culturally inherent values and traditions and national mentalities (Hofstede, 1993). These factors have made the transformation of social systems extremely difficult.

Applied to our task of identifying European vocational training models, this would mean that although they represent a specific response to changing technological socioeconomic and political problems, their structural change processes are governed by a considerable and persistent tendency to cling to tradition. Tradition and modernity are not adversaries. They are actually identical. We can talk of a specific tradition-bound modernity.

2.3. Three vocational training regimes

Of course, we could consider individual countries in isolation when describing the historical development of vocational training in Europe, and restrict ourselves to examining and compiling as complete a summary of the relevant sources and their inherent interpretations as possible, thus presenting an account of historical events. However, the academic and practical use of such a small-scale venture would be limited and this study is concerned with expounding specifically European aspects. This requires us to analyse dialogue and cooperation which may have occurred between European nations, and of which we knew little or nothing until now, on reshaping their vocational training under the influence or pressures of the changes sparked by industrialisation. What specific principles, organisational forms and learning concepts from this dialogue have proved to be trendsetting and have left their mark in the form of national institutions?

To date historical vocational training research has been able to identify three 'classical' European training models, which formed during the first phase of the Industrial Revolution in response to the erosion of the craft-trade-based vocational training model (Greinert, 1999). They are: the liberal market economy model, the state-regulated bureaucratic model and the dual-corporatist model.

The liberal market economy model, first realised in Britain in the 18th and 19th century, forms a market relationship between the functional subsystems of labour, capital and education emerging from the social evolution process influenced by industrial capitalism. The main protagonists of labour and capital, who should be freed from traditional restraints as far as possible, also maintain free market relations with the new education subsystem. Structural disadvantages prevent workers from using the education subsystem to market themselves as a 'qualified' production factor. Thus they must sell themselves as mere human resources and accept the social consequences, which can be disastrous (e.g. child labour).

The corresponding market model of qualifying the workforce has the following characteristics:

(a) a quantitative relationship between training supply and training demand, regulated by the market. Those supplying various skills and those demanding them can meet on a voluntary basis in a – in principal – 'free' market (i.e. training market not primarily controlled by the state);

(b) the type of vocational qualifications (qualitative aspect) ultimately depends on their projected application in the labour market and in the actual businesses and authorities. The transferability of vocational qualifications between companies varies according to the market, but is usually fairly limited;

(c) training practices are not particularly standardised. Schooling, in-company training, alternating school and in-company training and organisationally and technically advanced training methods can all be marketed (e.g. as distance learning courses or via e-learning). However, few widely accepted certificates exist;

(d) the cost of training is borne individually, usually by the person requiring training. However, businesses also often pay fees if they are supplying the training themselves. In this case training courses – usually providing partial vocational qualifications – are subject to the principle of cost minimisation;

(e) countries with market models of vocational training distinguish sharply between general vocational education and specific vocational training, both as definitions and within institutions. Vocational education is always conducted in state schools, vocational training stems from voluntary agreements between market players.

The state-regulated bureaucratic model, first implemented rigorously in France, uses the new education subsystem to create a political, power-based relationship between capital and labour. For general socio-political reasons, structurally disadvantaged workers are 'qualified' with the help of a state-regulated and state-financed education sector (which also includes vocational training). Workers can then engage the capital subsystem, again within a state-regulated framework. This model contains the risk that vocational training institutions may be too strongly influenced by the logical structures of the general educational system and degenerate to a subordinate branch of it.

The corresponding education-driven model of vocational training has the following characteristics:

(a) the quantitative relations between training demand and concrete vocational training are determined by state bodies or bureaucrats. Since this kind of demand planning cannot go into great detail, it functions most effectively when it is based on a limited contingent of basic occupations;

(b) the types of occupational qualifications (qualitative aspect) are less dependent on their immediate application in companies. Abstraction, verbalisation and theorisation usually form the central principles of vocational schools' curricula. Simple occupations characterised by practical activities cannot implement these principles in a desirable fashion;

(c) school training models are usually characterised by a clear differentiation of individual training course types. Admission to the various schools, which are starkly scaled according to qualification demand and the leaving certificate obtainable, normally depends on the various leaving certificates from general education schools or on special entrance examinations;

(d) vocational training in schools is financed by the state budget. Its inherent limitations do not allow the extension of vocational schools to accommodate the full cohort of a school year. Seen also from this perspective, education driven vocational training models seem mainly to embody an elitist system which primarily focuses on imparting higher-level professional qualifications;

(e) education driven vocational training models are almost necessarily subject to the 'escalator effect', i.e. their courses have a tendency to keep moving up the qualifications ladder, at least in the medium term. Consequently, new training courses or institutions must constantly be devised to replace lower qualification levels. Thus, vocational training for all is in an almost permanent state of crisis.

The dual-corporatist model, which mainly exists in German-speaking countries, uses a relatively independent vocational training subsystem as a means of communication between labour, capital and state. The intervention of legally revived 'intermediary' institutions, the state-regulated chambers, which administrate and manage the qualification of workers on behalf of the state, at least allows some limitation of state and market failures in one important public field. However, the clear organisational and legal detachment of the vocational training system particularly from the 'higher-level education' system (grammar schools, universities) creates considerable problems as regards progression routes.

The corresponding dual system of vocational training has the following characteristics:

(a) dual vocational training systems are largely isolated from the general education sector. They have their own organisational structure and training regulations as they are mainly run privately. Their twofold market and bureaucratic regulation pattern requires complex coordination;

(b) companies are the primary learning venue in this 'cooperative' system. Young people sign a private training contract with the company as employees with special trainee status. As they also attend vocational school, they are legally pupils and are subject to the rules of the general education system;

(c) training method and content are chiefly determined by the company or by internal interest groups. Employers, trade unions and state bodies jointly decide on career profiles and training ordinances in a regulated process. They are legitimised through an act of parliament;

(d) individual companies usually pay for the training. The costs can be declared as operating expenses for tax purposes. The company provides its trainees with remuneration which is fixed by collective bargaining. Vocational schools are financed by the public sector;

(e) dual vocational training systems have a traditional, craft-based background. Three traditional principles have endured to this day. The principle of vocation (*Berufsprinzip*), the principle of self-administration, which applies to the main, in-company part at least and the principle of learning while working.

These three vocational training models constitute prototypes, which were generated in the European nations' search for new ways of approaching vocational training for the masses in the wake of industrialisation (Greinert, 1999). It is unlikely that this process produced any further models. We maintain that all other vocational training models which arose in the various European countries throughout the 19th and 20th centuries are variations and/or combinations of these three prototypes or basic models.

2.4. Three concepts legitimising three learning orientations

Reflecting on the formation of specific types of vocational training in the industrial age, a European dimension becomes obvious if one attempts to question the findings outlined in Sections 2.2 and 2.3 with regard to the ideological context. Our search for underlying ideological concepts of the processes described there can identify three European main streams which specifically interact. They are traditionalism, liberalism and rationalism.

These three central legitimising concepts of European thought form the ideological context to the three vocational training models. The concepts do not only apply to the regulatory level, but also structure the operational level, i.e. the actual vocational training activities and the specific ways of learning. This approach has much in common with the three ideal 'qualification styles' devised by Thomas Deissinger (Deissinger, 1998).

We define our typology of legitimatisation for vocational training models in Europe as follows:

Traditionalism legitimises vocational orientation. According to the modern, post-enlightenment view, this legitimatisation concept is ideally based on tradition, i.e. on the one hand on the vocational practices implemented in Europe since the Middle Ages and, on the other, on occupations as a way of categorising organisational forms of human resources. From this perspective, occupations are understood as specific combinations of the elements work, competences and earnings. The activities they involve are determined according to traditions and social arrangements.

The core elements in individual occupations are grouped into characteristic exchange patterns. As a standardised social exchange pattern, an occupation forms the central link in social relationships, which are determined according to their 'role'. However, occupations are also the primary source of identity, i.e. of the image individuals have of themselves and through which they present themselves to their environment. This has not changed fundamentally in Europe.

The 'occupation' category allows a training model to develop the capacity to transfer economic, social and pedagogical issues and problems to a systemic logical framework and to process them productively. This capability, which modern system theory terms 'self-reference', can engender an independent training system.

Liberalism legitimises market orientation. This concept is based on the teachings and principles of economic liberalism and classical national economics. The central assumption is that people are capable of organising their social interaction efficiently, particularly their working life, on the basis of their own reason and insights.

Along with the principles of a consistent decentralised economic order, private property, free-market competition, free choice of profession and/or job, the merit principle, etc., economic liberalism rejects any state intervention in the economy, which is in the hands of autonomous individuals, and demands that state policy be limited to satisfying a few basic general requirements. This includes the avoidance of compulsion (imposition of legally regulated 'duties'). Strict consideration of the individual's responsibility for him/herself should not only be interpreted as an element of freedom. It also entirely fulfils liberal expectations of the function of a social adaptation mechanism.

Market-oriented vocational training arrangements impart only employable skills, i.e. company-specific practical knowledge, skills and attitudes needed for available jobs. Young people are not required to gain any particular qualification after completing compulsory schooling, before starting their working life. Their integration into the social and labour system is primarily dependent on market pressures.

Rationalism legitimises academic orientation. This is based on the conviction that academic rationality should apply when setting the organisational didactic principle for vocational qualifications. Practical access to the material world should no longer be gained by retrospectively applying scientific findings to the tradition-bound experiences of individual companies and occupations, but by subjugating all practices to scientific monitoring and experiments.

The concept of attaining vocational qualifications via an academic approach is an immediate product of the Enlightenment and embodies the spirit of modernity, that is, that science, particularly mathematics and the exact natural sciences, will rule the world, especially in the field of technology. Specialised academic training becomes the standardising didactic principle throughout all levels of vocational qualification.

Strictly knowledge-based vocational training models are most effective in so-called 'higher-level', theory-oriented (i.e. academic) professions. However, achieving the necessary integration of intellectual competences and the relevant practical skills remains a problem.

The three legitimatisation models of modern vocational training approaches in Europe outlined above are based on central ideas which can be seen as the new principles of order for human interaction and modern interpretations of the world since the Enlightenment. However, in cases of traditional orientation, significant doubts may surface. We feel they are unfounded. The most famous *Bildungsroman* of the 18th century, Jean-Jacques Rousseau's *Emile*, deals with the problem of religious orientation. In view of the Enlightenment's philosophical relativity of all religions, Rousseau saw no rational reason for one particular choice. All religions of revelation presented equally plausible options. However, Rousseau surprisingly recommends his pupils to stick to the religion of their ancestors and justifies this by referring to tradition. Viewed critically, this position could be seen as overtaking the Enlightenment. The vocational training expert Herwig Blankertz made the following comment: 'Tradition is the arsenal of values which we acquire not because our sense tells us to, but because we believe in it thanks to the heritage that previous generations have passed down to us [...]. Rousseau's pedagogical approach did not overtax the mind but inserted the power of tradition into the rational system of natural upbringing as the last word on legitimising human orientation to norms' (Blankertz, 1982, p. 78 et seq.).

We believe that vocational, market and academic orientation can be considered as didactic principles in all European vocational training models, whatever the dominating specific structural or regulatory principle in the respective country might be. In the German system, the principles of market orientation (e.g. in vocational continuing training) and academic orientation (in practically all vocational schools) join the vocational principle as important factors at the operational level. The French training model incorporates occupational and market orientation alongside academic orientation. Even the strongly market-oriented British training model is also structured according to occupations and according to the specialist vocational subject system in the country's further education institutions.

2.5. Conclusion

To summarise, our observations have produced three structural models of vocational training in Europe. Viewed from three different perspectives, each demonstrates characteristics which can be combined into a higher typological unit:

(a) in type A, the economy takes priority from a cultural perspective. Training is regulated primarily by market forces. The functional needs of the company or the actual job are the leading didactic principle;

(b) in type B, politics take priority from a cultural perspective. Training is primarily regulated by bureaucratic control. The academic principle is the main didactic tenet;

(c) in type C, society takes priority from a cultural perspective. Training is primarily regulated by dual control, i.e. a combination of market and bureaucracy. The vocational principle is the determining didactic orientation.

These three types of vocational training have been the building blocks for vocational training arrangements in various European countries since the Industrial Revolution. They have great tenacity. A universal decisive move away from this tradition cannot be perceived in Europe.

The modernisation and reform of vocational training models in Britain and France in the last 20 years of the 20th century provide evidence of this. In both cases it is clear that the central reform initiatives (national vocational qualifications and alternance training respectively) adhered strictly to the training regimes developed in the 19th century (Greinert, 1999). Politicians in both Britain and France tried to push through alternatives, but ultimately they were bound to the path their countries had taken. The same holds true for Germany: the various approaches to make vocational training more flexible did not really alter the traditional patterns.

The European structures and control models established in the first Industrial Revolution are displaying remarkable endurance. Despite changing technical and socioeconomic influences, even despite wide-ranging explicit political attempts to replace the respective ‘inherited’ model with allegedly more attractive and more effective alternatives, the typical procedures and organisational structures of the classic European models presented here maintain the upper hand in the countries in which they originated.

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3. Apprenticeship systems in England and Germany: decline and survival

Thomas Deissinger

3.1. Introduction

The issue of how to integrate the next generation into the labour market both quantitatively and qualitatively is common to all nations. In general, vocational education policy in each nation concentrates on its traditional relationship between education/training and employment, and on how responsible companies should be for designing, implementing and financing. The fact that many developing countries and those experiencing economic growth are experimenting with 'alternating' or 'dual/dualistic' vocational training concepts does not primarily indicate a positive attitude towards the German training model (Deissinger, 2003; Stockmann, 1999). Instead it suggests that their governments have recognised the wisdom of a practical learning approach and the importance of imparting the 'right' skills for working life. Despite these aims, vocational training tends to evolve in a way that seriously challenges political and economic traditions and thus tempers passions for excessive reform. However, this by no means excludes adopting ideas from foreign models. While developing countries lack sophisticated institutional differentiation, Europe's specific national attitudes and cultures ensure continuity, either manifestly or latently.

Comparative educational science is thus assigned the task of collecting data on training structures and furnishing 'an *explicatio*', an analysis of the factors, motivations, tendencies and determinants shaping VET (Schneider, 1961; p. 86). Addressing the origins of schooling, Reichwein talks about the 'inherent teleology of its functional relationship to the culture as a whole'. He states that training institutions are more than the product of abstract pedagogical ideas and claims it is a whole array of practical impulses which shape educational systems (Reichwein, 1963; p. 89 et seq.). The system theory view, which regards society as an entity seeking to reproduce and maintain its population, also postulates that the whole system claims the services of societal subsystems (Parsons, 1976). Educational institutions are anything but simple mechanical reproductions of their blueprints. They are the result of responses to a society's needs through its turbulent history (Georg, 1997; p. 83). For this reason, comparative VET research must take a 'multiplane' approach. A simple look at the current and historical contexts of national education and vocational training systems provides insight into countries' idiosyncrasies (Schriewer, 1987; p. 632 et seq.).

This stratified approach is particularly important in places where homologous concepts and notions that have endured through history confront one another. In Germany's apprenticeships, the basic model of initial vocational training took on new forms under the

dual system to respond to the needs of self-industrialisation and national determination. However, in England, apprenticeships have undergone successive, sustained marginalisation. The following historical analysis attempts to reconstruct the two countries' different development processes and derive an 'explanation.' It will posit reader familiarity with the structural peculiarities of the German vocational training system and make detailed references to developments in England (more details in Deissinger, 1992; 1993; 1994).

3.2. Structural differences between German and English apprenticeship

Classical occupational sociology (Beck et al., 1980) states that Germany's occupational system has a kind of socialisation function. Social and personal behaviour patterns are taught along with the relevant technical and practical job skills. Since apprenticeship in Germany is embedded in a regulatory framework, both the macro and micro levels of the vocational training system contain structural dictates that ensure training programmes have 'complex skill profiles' (Zabeck, 1992; Deissinger, 2001b). Their ordering function implies that the wide range of in-company training activities is considered an organisational and educational unit (Harney and Storz, 1994; p. 355). The system of 'State-recognised training occupations' has its own subjective view of employment and a unique relationship to the tertiary sector (Harney, 1985; p. 126).

The principles of dual learning location and dual responsibility are merely a component and a visible manifestation of a training system structured according to the principle of vocationalism. We should mention the 'organising principle' of the German training system along with the principle of vocationalism (Deissinger, 1998). The organising principle specifically structures the learning environment and learning processes and clearly differentiates the system's functions from other training options. The following 'quality criteria' are decisive:

(a) apprenticeships are the responsibility of the training enterprise under employment law. This partially releases them from the public sector's protective and educational obligations;

(b) apprenticeships have a 'public' character, since their training mandate separates them from service performance processes. This lifts the concept of 'vocation' above the concept of 'job';

(c) the articles of apprenticeships require subjecting the learning process to a binding form of didactic regimentation, producing marketable skills;

(d) apprenticeships are organised in a dual system in terms of both institutions and teaching. This facilitates the learning processes which represent various mentalities and philosophies;

German vocational training, including its institutions and teaching methods, can be described as highly structured despite its close ties to business and its market dependence. English vocational training structures, on the other hand, have for decades suffered from excessive market orientation combined with companies' reluctance to provide training. England exhibits considerable problems in qualifying and integrating young people (Perry, 1976). Gertrude Williams, one of the most committed advocates of training reform in the years after the Second World War, made the following observations on the shortcomings of the English vocational training system (Williams, 1963; p. 7):

(a) in England no external authority supervises training. Since no final examinations are held either, it is impossible to say how many apprentices acquire the minimum skills needed for their occupation;

(b) proper training programmes are very rare. Apprentices are expected to acquire their skills by watching;

(c) classes accompanying apprenticeships are not obligatory and we can assume that not more than 30 % of apprentices are given the opportunity to attend school alongside their training;

(d) even if enterprises do allow trainees to attend classes, they are not interested in their apprentices' progress in the trade school.

Simons suggests that the situation in England's modern vocational training system is a result of the lack of compulsory further education. She believes that Kerschensteiner's further education reform established the pattern in Germany. While the Germans were adopting educational policies, the English could not get beyond the planning and discussion stage, even after World War II. The few laws that were passed proved to be ineffective (Simons, 1966; p. 124 et seq.). Instead, England retained a VET system based entirely on business principles.

Looking at the process in Germany, we can see that craft trades again became the normal models of occupational training, thanks to the *Handwerkerschutzgesetz* (Craft Trade Workers' Protection Act) of 1897 and the support of policies favouring SME expansion (Lenger, 1988; p. 134 et seq.). Liberalism could not gain as much ground or validation in Germany as in other countries. The weight of conservative legitimisation models of vocational education upheld the anti-industrial position during the free trade period (beginning with the North German Confederation's 1869 Industrial Code) and later in the 20th century, particularly in the years after the Second World War (Stratmann, 1982; p. 183 et seq.). In contrast to the advanced industrial nations of England and France, this mentality prevailing in Germany guaranteed the survival of the *Meisterlehre* (apprenticeship with a master craftsman). A second characteristic of the German system is that the institution of the *Berufschule* (vocational school) has been a fixture in the vocational training landscape since the end of the 19th century. This has enriched training content but also formally dovetailed theoretical education with practice in a company (Blankertz, 1979; p. 277 et seq.). The craft trades asserted that companies were the 'correct' learning location for vocational training. *Berufschulen* arose as a synthesis of

reactionary vocational training policy, in which craft trades played a leading role as the 'model of German vocational education,' and the successful attempt to rehabilitate the German education system with the help of 'classical German vocational training theory' (Blättner, 1965; p. 27 et seq.). However, the dual system is not an educational theory construct. It emerged from the practical consideration that in-company vocational training needed to be complemented.

English apprenticeships have suffered a sad fate. To this day, companies are notoriously indifferent to ensuring that their future employees receive thorough training, despite the traditional links between companies and qualification schemes. At no time in the history of VET in England have companies offset the State's *laissez-faire*, which was statutory until 1964. This failure of free enterprise to fill the gap contradicts the fact that this type of vocational training system is precisely a result of the agreement of the executive and legislative branches of government to limit their interference in the economy, which has been taken for granted since the Industrial Revolution. In 1964 the British governmentfelt compelled to declare vocational training its affair. This commitment was reiterated in 1973 and again in the Thatcher era (Deissinger and Greuling, 1994). The decisive trigger was the dramatic slump in in-company apprenticeships which began at the end of the 1950s (Ryan, 2001; p. 139).

The policy of the Thatcher government aimed less at reforming the structure of training than at providing financial incentives. It did not focus on reviving apprenticeship (Deissinger and Greuling, 1994). The subsequent innovation, Modern Apprenticeships, introduced in 1993/94 (Unwin and Wellington, 1995; Fuller and Unwin, 1998), represented a slight change of direction in vocational training. Ryan describes the motivation and objectives of this initiative, which until now has proved to be a stable, if not fully pervasive segment of the qualification system (Ryan, 2001; p. 133).

'British apprenticeship is in upheaval. After a protracted decline, a major revitalisation initiative, *Modern Apprenticeship* (MA), was launched in 1994. As MA's weaknesses have become clear, reforms have been adopted, and proposals for further reform are currently under discussion […]. Government support for apprenticeship is motivated by several factors: low rates of learning and qualification amongst 16-19 year olds; a wish to increase the supply of intermediate skills, with apprenticeship as a favoured means, given its benefits for youth employment; and the failings of previous efforts, notably the 1980s Youth Training Scheme […]'.

Modern Apprenticeships are not merely conceived as a means of fighting youth unemployment, but are intended to fill the 'qualification gap' of both white-collar and blue-collar workers (Vickerstaff, 1998; p. 220). However, a closer look reveals that it has not simply reactivated the classic apprenticeship system (Snell, 1996; p. 319). It mirrors two essential features of the Thatcher government's approach to vocational training. First, Modern Apprenticeships are cofinanced by the public sector, making them a 'State initiative for revitalising the training system' (Ertl, 1998; p. 171). Second, it is linked to the national

vocational qualifications system established in 1986, since apprentices have to attain a national vocational qualification of at least level 3. It also differs from the classic English model, and from the dual system in Germany as well, in that although Modern Apprenticeship trainees have a training contract, companies are not obliged to fix a definite duration. Nevertheless, specifying training curricula guards against companies having too much influence and control over vocational qualifications. The scheme does not focus solely on outcomes (operationalisable training results), but also considers approaches to the qualification process and the training content. However, we must not overlook the fact that the Modern Apprenticeship constitutes just one of a range of education options. School-based vocational courses at colleges of further education and university courses are in much higher demand than non-academic in-company training. This contrasts with the situation in Germany. Approximately half the initial training participants in the United Kingdom fell under an in-company training scheme, including apprenticeships (European Commission et al., 1997; p. 62).

Two main trends characterise English vocational training policy of the last 20 years. One reflects the basic understanding that companies are responsible for designing vocational training programmes. This policy has always involved influencing the contours of vocational training paths. Examples are Youth Training Schemes (the name may constantly change, but the concept does not), currently under the guise of Foundation Apprenticeships, and (Advanced) Modern Apprenticeships.

The other trend includes the implementation of a National Qualifications Framework and the development of the all-embracing 16-19 Curriculum in the 1990s (Higham et al., 1996; Dearing, 1995). However, the latter does not shape an independent, self-regulating vocational training system, but the integration of trades based on the concept of lifelong learning. The paths are clearly caught in the conflict between heterogeneous educational requirements and homogeneous training and qualification approaches, and thus constitute 'individualised' tracks. The most recent examples are the terminological convergence of youth training schemes and apprenticeships and the renaming of general national vocational qualifications as 'vocational A-levels', which is meant to emphasise their similarity to the secondary school certificate needed for university admission and their claim to be a part of the national qualifications framework.

Therefore, we can say that British educational policy has been undergoing 'vocationalisation' since the 1980s, but cannot claim that the country has developed an independent vocational training subsystem. The national qualifications framework is clearly a hotchpotch of disjointed approaches, despite the fact that its stated purpose is to integrate and to promote transfer between different education and training paths and to create (formal) equality among qualifications on the same level. Two academic paths and one mainly vocational path exist. The reason for this dichotomy is probably the fact that England has no clear institutional stipulations, legal regulations on training, and that the various training providers act more or less autonomously, competing against one another in a variety of ways on the open training market and forging links with other players. (Reuling, 2001; p. 241). This is demonstrated in

the basic philosophy of British vocational training policy, which advocates modular structures and competence-based training. The continuing lack of a legal framework provides further evidence. One reason for the absence is the dominance of the economic freedom principle, another is that politicians have never made a concerted effort to introduce one (Ryan, 2001).

3.3. The end of the old occupational structure during the Industrial Revolution

The Industrial Revolution, which began in England around 1760, completed a development whose seeds, both intellectual and tangible, had been sown in the pre-industrial era. In the face of the flourishing textile industry, the prescriptive strength of the old economic order could not resist the sudden growth of capitalism, and the importance of an apprenticeship as a prerequisite for working or managing dwindled. It is noteworthy that the Elizabethan Statute of Apprentices that dated back to 1563 (Deissinger, 1992; p. 34 et seq.), which approved and sustained the seven-year training period stipulated by guild code, remained in force, at least on paper, until 1814. It was only at the culmination of industrialisation, starting in 1812, that there was parliamentary debate on the retention of the old English economic order which, in practical terms, had long since become defunct. The old, professionally oriented crafts and the country's conservative, romantic bastion took a final stand against the representatives of liberal economic thinking (Deissinger, 2001a).

Parliamentary debate revolved around the clauses in the Statute of Apprentices which prescribed a seven-year training period and those which were intended to protect craft trades from the practice of 'free employment' as was adopted in cottage industries and factories. The apprentice campaign failed for want of political support and was formally ended by laws passed in 1814 and 1835. The law of 1814 abolished the protected status of the seven-year apprenticeship as an occupational prerequisite. This was the end of *de jure* guild sovereignty in the occupational and economic order. The abolition of the Statute of Apprentices doomed the ideal of a regulated occupational order to succumb to the challenges and economic temptations that the golden age of industrialisation had to offer. Once again the law was compliant: in 1835 the Municipal Corporations Act was passed. Its intent was to suppress guild malpractice in the realm of town administration where they were still dominant. Although the law did not abolish these bodies, the outcome was a levelling of tax rates for all taxpayers in the interest of unimpeded economic development. The privileges of the guilds were restrained since the practice of a trade was no longer subject to the 'town charters' and consequently guild membership.

It is appropriate, with regard to England, to speak of economic and social developments in the late 18th and the early 19th century which were different from those on the Continent, not only in their level of advancement. English industrialism found focal points in the West Riding and Lancashire in the 18th century and in the Midlands in the 19th century. The delayed industrial development on the Continent is closely related to the fact that it underwent

no English-style technological revolution in the 19th century (Landes, 1983; p. 169). Production methods in the cotton industry, in particular, were entirely revised, bringing new types of organisation to the factory system, radically changing the working conditions of the employees. The practice of employing underage, untrained and semi-skilled trained workers in this new trade was unencumbered by the restrictions of the traditional professional code. In 1851, 41 % of Manchester's 12-year olds, 60 % of its 13-year olds and 76 % of its 14-year olds were gainfully employed (Anderson, 1971; p. 75). Towns grew around the factories. While more of England's population lived in the city than on the land by 1851, Germany only reached this level at the end of the 19th century, and France only after the First World War. In England, only a quarter of working men were still involved in agriculture around 1850; in Germany farm workers still outnumbered those in industry in 1895 (Landes, 1983; p. 181).

3.4. Liberalism and the tardy social State

Apart from the dynamics of the Industrial Revolution, with its creation of new occupations and its massive influence on the social environment of the workforce, the primary drive that sealed the fate of the old trade order in England was the spirit of the liberal era. Brentano describes an increasing hostility to all forms of state intervention in the freedom of commercial practice during the early 19th century (Brentano, 1871; p. 128). The special destiny of England is deeply rooted both in the national character of the English and in the practical application and economic legitimisation of the anthropocentric social ethics of Calvinism and the Anglo-Saxon Enlightenment. They not only entail the decline of artisanry and the social and economic order that supported them, they also constitute the essence of 19th century social policy.

Evidence of underdeveloped social policy can be seen in two main fields. One is the handling of the 'social question', particularly the matter of child labour. The other involves the conception of State organisation. This differs from the German pattern in that the outlines of a bureaucratic State were only tentatively created after half a century of industrialisation (Rohe, 1984; p. 167 et seq.). The professed liberalism of classical economics and political economy were as pervasive in the market place as Puritanism's moral dictates were in civic life. The thesis of Max Weber on the interrelations of capitalism and Protestantism is pertinent. Sociohistorical indicators corroborate this tenet, and thereby assert the importance of the Protestant Ethic as one of the historical bases of modern individualism (Weber, 1920). The gamut of liberal thought runs from John Locke to John Stuart Mill. From the anthropological premise of man being a creature concerned with his own advantage, liberal thinkers called for the dissolution of those bonds which restrained social progress and thereby restricted the 'wealth of nations'. It was self-evident to these thinkers that the economy was a 'field of fair play' (Freyer, 1966; p. 113) and that the State is a guarantor of individual rights but has no economically interventionist mandate. Such a reduction of state function corresponded above all to economic dictates and challenged both the pre-industrial order and the new welfare-oriented policy of social conservatism (Deissinger, 2001a).

Due to fluctuations in the social order, and given both a social policy that had prescribed the principle of social control since Elizabethan times (Johnson, 1970) and the dearth of socio-occupational integration, education for the 'lower orders' was conceived of as entailing nothing beyond the 'harmless first elements of knowledge' (Altick, 1973; p. 255). A state church linked to the old social order, and the influences of tendencies from congregation-governed denominations gave rise at the turn of the 18th century to a Protestant mentality (Kluxen, 1985; p. 526-531) with far-reaching consequences for the Victorian Age which seemed to combine socially conservative and embryonic progressive thought without apparent contradiction. In the matter of education, the autonomy of the church led to the primacy of religion in general and vocational education, which explains why it was 1870 before the State could take charge of educational policy, and even then this was part of a compromise. The law permitting state schools to exist alongside denominational and private institutions, where the latter were not in a position to guarantee education, was a harbinger of the 'British disease' (Deissinger, 1992; p. 295 et seq.).

In describing the Anglo-Saxon relationship between educational progress and industrialisation, it is axiomatic that economics dictated what was to be done or not to be done in the non-economic field. The lack of education for children and young people was undeniably a product of the demands of factories on their 'apprentices'. The half-time system of education, a social conservative policy among the factory acts which permitted the combination of school education with factory work, is the most obvious indicator of the subordination of necessary pedagogical and social policy to the value of the human as a commodity in the industrial production system. There is proof that the rate of illiteracy in factory towns was well above the national average and that the half-time system was inadequate in the second half of the 19th century. While the first factory act (the Factory Health and Morals Act of 1802) only made token provisions for school education to supplement apprentice training, the statute of 1901 stated clearly that 12 was the minimum age for factory employment. Young pupils were only allowed to work part-time until the age of 15. These laws are not, however, to be construed as a brief for part-time vocational education. Classes were limited to the traditional primary educational canon of the church and private schools. The scholastic education of workers was only intended to furnish them with such social competences as were necessary for factory morals and discipline. The factory laws were not damned by liberals of the day but were nonetheless viewed with reservation. The limiting of factory work – whether its motivation was humanitarian or pedagogical – was ultimately a macroeconomic question, a matter of the distribution of wealth. Under such premises the half-time system, just as other institutional forms of primary education for the 'lower orders,' remained subject to conflict between 'ideological positions,' whereby the standpoints and interests of the industrial middle class proved particularly resistant to any welfare-state attempt to establish a national system of education and training (Deissinger, 1992; p. 223 et seq.).

3.5. The adaptation crisis in the second half of the 19th century

There are many reasons to conclude that the English educational system 'failed' when the time came to give up traditional educational and social models and redefine the training of workers as a national imperative. Whilst the country was the workshop of the world in the 'textile phase of British industrialisation' (Hobsbawm, 1982; p. 111 et seq.) and at the time could use comparatively simple training schemes, in the second half of the century and in the period before the First World War it was increasingly difficult for England to maintain its lead as an industrial power. Contemporaries unanimously remarked that one of the causes of the British Disease was inadequate education which offered hardly any vocational qualifications that reflected the requirements of the economy (Wiener, 1982). Two major historical factors can be blamed for the adaptation crisis in education. First is the traditional limitation of education for those classes of society whose lot was the working world. These, as productive parts of the economy, were assigned values in terms of their predestined places in the production process. Second, this *laissez-faire* in the evolution of society was not tempered by a professional or government code which might have moderated the subjugation of qualifying and integrating new generations to market demand. The tardiness of training progress in England became increasingly visible in the dichotomy between vocational and general education and in the government's lack of interest in founding an educational system equipped to meet economic, social and industrial demands. It is reasonable to believe that social conservatism, economic complacency and the absence of a renaissance in the teaching profession were the factors adversely affecting English vocational education. The country placed its faith in workplace training. Even the typically English institutional scientific education and technical education had little impact on the training of workers. An example of the 'failure' of relevant working-class institutions is that of the mechanics' institutes, originally founded in the late 18th century (Deissinger, 1992; p. 329 et seq.). From the outset they were intended to offer educational training to craftsmen and skilled workers by teaching them the 'scientific principles' of their trades. Their disregard for occupational training and their concentration on higher training of workers and artisans eventually caused the institutes to drift into general education. In the face of growing union agitation, skilled artisans felt obliged to distinguish themselves from the proletariat and to assimilate themselves to the ethical code of tradesmen and industrial entrepreneurs. The mechanics' institutes neither succeeded in opening their gates to a broad public of unskilled factory workers, nor did they succeed during the 19th century in stabilising or reactivating guild norms such as consolidation of the regulatory institution of apprenticeship. This was because the 'worker aristocracy' defined itself as an elite associated with organised vocational training and material advantage. Neither schools nor business had a global strategy to educate and qualify the working classes.

3.6. Company vocational training at the dawn of the 20th century

Indirect government influence on the form of 'apprentice training' can be seen in the legal framework provided by the factory and school laws in the second half of the 19th century. These defined working conditions and hours for young employees as well as general school attendance rules and the scope of the half-time system of education. The employment of children was, nevertheless, still common practice at the turn of the century. This was the doing of the factory acts themselves, since they did not apply to the small concerns run as sweatshops. Children and young people, particularly in regions and cities with no adequate schooling facilities, took employment at as early an age as possible to help support their families. Although the Factory Act of 1901 provided that children under the age of 13 might not even take part-time employment, this law only covered about one third of children and young people. In the small businesses in towns and cities child labour remained a feature of life.

The social reformer Richard H. Tawney ascertained at the end of the century that there was a knot of vocational training problems which he ascribed to the dichotomy between boy labourers and boy learners (Tawney, 1909).

According to Tawney, in Liverpool in 1901 only 3.4 % of all 14-year olds received training, while 55.5 % worked as casual labourers in all manner of occupations (Springhall, 1986; p. 237). Where there was a tradition of training, its quality was very varied. In the light of stark differentiation between workers and distinct worker hierarchies, Tawney distinguished between the groups of common apprentices, premium apprentices and privileged apprentices in the metal industry. While a tuition fee was necessary for a premium apprenticeship, the third category involved rotating from one workshop to another and learning all metalworking techniques. The 'deregulated' nature of apprentice training was not only connected to the transformed structure of the working world, but was intensified by the restrictive control over vocational training held by the 'worker aristocracy'. Apprenticeships were no longer to be seen as a generally valid standard, but instead as trade specific and negotiable. The training was given according to the principle of 'following up' and 'improving' – which involved the acquisition of journeyman status without a regular structured examination. This basic requirement to complete training corresponded to the medieval system of time-serving (Aldcroft, 1992; p. 55 et seq.). Two developments played a role here: the decline of classical apprenticeship training in skilled professions and the increasing supply of casual labour and call for untrained hands due to population growth. As ever, the industrial centres of the northern counties showed the greatest demand for boy labourers. Tawney speaks of 'non-educational employment' (Tawney, 1909; p. 525), for which young people received no preparation in primary schools and no real tuition except perhaps rudimentary on-site training.

3.7. English further education schools at the dawn of the 20th century

The expansion of English primary schooling to secondary level took place in England around the turn of the century under 'education efficiency premises', due to, in the words of Michael Sadler, the absolute necessity of 'imitation of the educational policy of Germany and the United States' (Sadler, 1907; p. 13). This led at the end of the 19th century to the continuation schools, most of which were evening schools. They were expected to fulfil a dual function: to extend and elaborate primary education, and to prepare for studies at an institution for advanced learning in engineering and sciences. Despite this, joining the workforce at an early age remained the main cause of inadequate basic education. Given these conditions, it was difficult for a continuation school to establish itself as a valid form of education. Like the skilled worker institutes, the continuation schools were treated either as a belated form of primary school or simply as a form of general education, an 'annex to the mechanics' institutes' (Grothe, 1882; p. 64). In 1894, under the Acland Code, the government opened the evening continuation schools for adult education. From then on, people over the age of 21 could take advantage of these further training institutions. Vocational training was expressly set apart from this and seen as a separate system governed by concepts such as freedom of employment and independence of the employer. The 1901 census testifies to the sorry state of education at the turn of the century. Figures for 12-17 year olds in England and Wales show that 17.7 % attended a public school, 6 % attended a secondary school (either a grammar school or a private school) and only 6.9 % attended an evening school (Sadler, 1907; p. 105 et seq.). Due either to lack of facilities or reluctance to continue schooling alongside employment, the majority of young people had no place in the English educational system. In 1902 the Balfour Education Act formally separated the 'non-obligatory and therefore ineffective evening further training institutions' from the primary schools (Metz, 1971; p. 35). They were thenceforth part of 'advanced education', like the traditional secondary schools and the varied institutions which offered technical education. The schools remained non-compulsory. This situation differed markedly from the German system. Sadler, an acute observer of tendencies in Germany, noted the conspicuous 'national interest in education' in German provinces (Higginson, 1990; p. 247) as exemplary and worthy of imitation. Sadler was a close friend of Georg Kerschensteiner, the 'father of vocational training'. The English educator admired Kerkensteiner's 'Munich Model', which created further training institutions that were oriented towards both the needs of the civil state and to the ends of training with a view to qualifications (Greinert, 1975; p. 80 et seq.). Sadler recognised that the education of young people beyond elementary school was not only the fulfilment of sociopolitical considerations but was also the result of pedagogical and welfare policy.

In 1908, a Scottish educational law decreed the attendance at a continuation school for those over the age of 14 and stated that it was no longer the duty of parents to guarantee attendance, but that a school board would take over this responsibility. This one step put Scotland a whole decade ahead of England in terms of educational development. In 1909 the Acland Committee was entrusted with the task of estimating the transferable applicability of this law to England

and Wales, given conditions prevalent there. The Acland Report also made reference to the Munich Model: 'No one has done more to develop a satisfactory system of continuation schools than the city superintendent of education in Munich, Dr. Kerschensteiner' (quoted by Metz, 1971; pp. 143-144). The fact that England was nonetheless incapable of realising a school policy that was oriented towards the Scottish model, thereby indirectly drawing on the German example, is demonstrated by the loose and didactically vague structures of its continuation schools. It was noted that in Germany, where a system of further training schools had replaced that of the extended school of the 19th century, the number of uneducated was conspicuously low, while in London unskilled labourers made up 68 % of the total workforce. Nonetheless, the attempt in 1918 to introduce compulsory secondary education within the framework of a new educational bill for the UK was a failure. In 1921 the first 22 of the compulsory further training schools introduced by law were completed and operating in London. It became apparent, however, that the Fisher Education Act was scarcely acknowledged and applied outside the capital. The majority of the schools founded in the early 1920s closed again after one or two years, not least because employers resented giving their young employees and trainees time off. Fiscal restrictions of the 1920s helped extinguish the idea of any public further training school which could not claim 'rights of seniority' over other forms of schooling.

It is not possible to treat the entire development of English vocational training in the rest of the 20th century in this article. It is sufficient to say that even the far-reaching Educational Reform Act of 1944 failed to create impetus enough to instigate nationwide compulsory further training school attendance. The planned county colleges, which were never actually founded, (Aldrich, 1992; p. 66), were supposed to assure that young people between 15 and 18 did not entirely fall out of the school system. The Crowther Report referred to this aborted state intervention in the field of post-elementary education and England's chronic vocational training 15 years later with these words: 'This report is about the education of English boys and girls aged from 15 to 18. Most of them are not being educated' (quoted by Perry, 1976; p. 139). The political and educational guarantees of the sort provided by German vocational schools remained alien to the English system. The elements of the German system did not and still do not correspond to the reference points within the Anglo-Saxon interpretation of the vocational training and integration problem.

3.8. Conclusion

Education and vocational training should not, and cannot, be separated from the history of a country, its social development and its institutions. The same is true of the radical realignment of educational structures that amount to a systematic approach (Winch, 1998; p. 377; Deissinger, 2001c). The major differences between German and English development in this matter are to be seen in society's handling of the apprenticeship issue during the period of heavy industrialisation. In Germany, craft trade practice was a standardising factor of professional training (Blankertz, 1969; p. 127) because liberal thought was not as predominant

there as in other countries (Stratmann, 1982; p. 183 et seq.; Gonon, 1998; pp. 260-261). This perpetuated apprenticeship to a master, which in England never played anything more than a marginal role in the field of vocational training. The vocational training specialist Abraham furthermore refers to the 'difference between work-accompanying and school-based vocational training in Germany' as a solution to the vocational training problem due to its foundations in presumptions which either did not exist in other countries or at least not to the same extent (Abraham, 1962; pp. 171-172).

Although German and English vocational training face the same challenges, they are of significantly different character. The English system can be seen as decentralised and extremely heterogeneous because of the training and qualifying process provided by the individual businesses involved; this situation persists despite seemingly innovative reform concepts that the environment particularly tried to impose in the form of state regimentation. The prevalent pattern was determined by the socioeconomic conditions of the Industrial Revolution (Deissinger, 1992; 1994; 1999). One of the historical 'origins' of the English vocational insularity was the intellectual approach sponsored by the tradition of Calvinism and the Anglo-Saxon Enlightenment. Evidence of underdevelopment of social policy (compared to Germany) can be seen in two main fields. One is the handling of the 'social question', the other involves the evolution of state organisation, which differs from the German pattern in that the outlines of a bureaucratic state were only tentatively formed after half a century of industrial development (Rohe, 1984; p. 167 et seq. passim).

England's 'decision' in favour of liberalism also led to the ideological preconditions which paved the way for the legitimisation of a range of welfare functions in the 19th century. It is, therefore, appropriate to name economic liberalism and its theoretical treatment of the production factor 'labour' as a culturally significant feature of English development (Biernacki, 1995). Its proponents have also left their mark on the Anglo-Saxon vocational training system due to their essentially ambivalent response to the role of the state. For liberal thinkers, the state's *raison d'être* is guaranteeing individual rights, but it has no economically interventionist mandate. In line with such thinking, both forceful ideas and 'genuine' sociohistorical 'drives' influence the shaping, re-crafting and the reformability of vocational training. Comparison of the German and the English history of vocational training offers much evidence to support this conclusion.

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4. Apprentice strikes in British metalworking, 1919-69: attributes and interpretation

Paul Ryan

4.1. Introduction ([2])

An interesting attribute of the modern histories of both apprenticeship and industrial relations in the UK is the high strike propensity of metalworking apprentices. Between 1910 and 1965, they launched a series of strikes that ranked alongside adult ones in both magnitude and frequency, and were conducted for the most part independently of adult ones. Eight of these apprentice actions were sufficiently extensive, large and protracted to be termed strike movements, in that they spread from district to district, drew in many thousands of young people and lasted for several weeks. They were mostly launched in support of demands for higher pay scales for junior male workers in general, and apprentices in particular.

The phenomenon of the apprentice strike has been largely ignored, both at the time and subsequently, in research on industrial relations, industrial training and vocational education alike ([3]). Interest has been confined largely to social history ([4]). This paper argues that the apprentice strikes constituted an important feature of industrial conflict during the period and exerted a potentially powerful influence on the evolution of industrial apprenticeship.

An apprentice strike is not, however, simple to interpret. At one pole, it may be viewed sociologically as a manifestation of youth exuberance, part of the long tradition of apprentice larking about and rioting. At the other, it may be interpreted from an economic standpoint as a serious interruption of economic activity, imposing damage on both employers and apprentices themselves. This view is termed here the 'real damage' one.

Continuing with an economic perspective, the very idea of an apprentice strike may be paradoxical. Any threat by apprentices to strike might be empty, were its prospective damage confined to the apprentices themselves, in that during a strike they would earn and learn less while their employers enjoyed a temporary cut in payroll costs. This interpretation – here

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([2]) This paper is a shortened and revised version of the paper presented to the Florence Conference. I would like to thank: Wolf-Dietrich Greinert, Thomas Deissinger, Georg Hanf, David Lyddon, Alan Macfarlane, Alan McKinlay, Alastair Reid and Keith Snell for encouragement, comments and suggestions; the Engineering Employers' Federation and the Department for Education and Skills for unpublished information; and the Modern Records Center (Warwick), the Public Record Office (Kew) and the Mitchell Library (Glasgow) for help in locating archive materials.

([3]) E.g. Knowles (1952), Williams (1957), Cronin (1979), Durcan et al. (1983), Sanderson (1994).

([4]) Knox (1984), Croucher (1982), McKinlay (1985, 1986), Fowler (1995). See also Gollan (1937) and Frow E. and Frow R (1983).

termed the 'empty threat' one – is clearly compatible with a sociological emphasis on the youthful letting off of steam.

This paper argues that, given the heterogeneity of British metalworking apprenticeship, both interpretations have relevance. At the same time, a range of evidence points to apprentice strikes as having had serious effects on employers, and thereby contributing to a sea change in apprenticeship-related wage structure, which in turn promoted the decline of apprenticeship activity. Apprentice strikes contributed also to the further erosion of the distinction, both *de jure* and *de facto*, between apprenticeship and regular employment. The embedding of apprenticeship in industrial relations that occurred during the period (Ryan, 1999) owed much to apprentice activism. The casualty was any prospect for apprenticeship to develop into part of vocational education, as has occurred in much of continental Europe.

4.2. Patterns

Industrial conflict is measured along three dimensions: number of strikes, number of strikers, and strike duration. As strike activity varies by time and place in different ways across these dimensions, all are relevant to the description of apprentice strikes. A fourth dimension, which has the merit of combining all three, is working days lost, or striker days.

This paper focuses on a specific subset of all strikes: 'principal' (i.e. large) disputes, monthly published reports of which indicated throughout the period the primary categories of employee involved ([5]). An apprentice strike is taken here to be a principal dispute in which the primary or sole class of employee directly involved was reported as 'apprentices', or 'apprentices, boys and youth' (e.g. 'engineering apprentices' for May 1939) ([6]). The period 1919-70 saw 16 such disputes in engineering and shipbuilding. Most occurred during three subperiods: the post-war slump (1921-22), rearmament and war (1937-44), and the 1960s. All appear to have satisfied the criterion eventually established for a 'principal' dispute, i.e. at least 5 000 working days lost.

The quantitative importance of apprentice strikes can be gauged from their share of principal disputes in metalworking as a whole, as shown in Figure 1. In most years apprentice strikes constituted only a small share of principal disputes, particularly in terms of the number of disputes. In some years, however, they featured prominently, notably in 1937, 1941, 1952 and

([5]) Detailed data on participation in principal disputes are available only from 1925.

([6]) All youths, including apprentices, are treated here as employees, despite the formal legal differentiation of contracts of apprenticeship from those of employment (service). The marginal content of that difference, both *de jure* and *de facto*, became increasingly marginal during the period (Hepple and O'Higgins, 1981).

1960, when they accounted for at least one-third and as much as nine-tenths of working days lost (in principal disputes in metalworking) ([7]).

Table 1 describes the eight of these principal disputes that may be termed strike movements, in the sense of involving more than one firm, and usually more than one district, and either continuous or near-continuous strike activity from start to finish (apart from prior token strikes). An apprentice strike movement occurred on average every seven years during the five decades. It saw an average of 18 000 youths spend 10 working days each on strike during a period nearly six weeks long, involving the loss of 180 000 working days.

The apprentice movements mostly started in either the Clyde (Glasgow) or the Manchester areas and then typically spread to the other one, and often to other districts too. The 1937 and 1960 movements travelled the furthest, taking in Northern Ireland and parts of the Midlands (Coventry) and the South (London), as well as the traditional industrial heartlands of central Scotland and northern England. The participants in these movements were mostly male manual (trade) apprentices. Other categories of young worker, including labourers, trainees, non-manual apprentices and females, participated on several occasions, but only as small minorities ([8]).

Apprentice strike movements were no novelty at the start of the period. In 1912, 15 000 apprentices had struck, for an average of 18 working days each, in pursuit of a wage rise to compensate them for the recent introduction of national insurance contributions (Knox, 1984). But the phenomenon did not outlast the 1960s, and the timing of its extinction potentially informs the problem of its interpretation (Section 4.5., below).

The evidence points to engineering and shipbuilding apprentices as a moderately strike-prone employee category. Their propensity to industrial action has been largely forgotten, even though the strike-proneness of metalworking as a whole has been widely recognised.

4.3. Context, attributes and strike demands

The key attributes of metalworking apprenticeship during the period from an industrial relations perspective were the weakness of the distinction, both legal and practical, between apprenticeship and regular employment, the weakness of the contribution made by apprenticeship to vocational education, the complexity of the relationship between apprentices and trade unions, and the increasing integration of apprenticeship into industrial relations.

([7]) All apprentice strikes involved the engineering industry, and most shipbuilding as well. Metal manufacture was also affected in 1952, but construction, which also employed many apprentices and young workers, appears never to have been involved.

([8]) Manual male apprentices accounted for 97 % of the 5 470 young workers who participated in the 1952 movement in federated Scottish engineering firms (EEF case A(7)2).

4.3.1. Context

By 1919 the engineering and shipbuilding industries had already adopted industry-wide (national) collective regulation of employment relations, involving an employers' federation (the Engineering and the Shipbuilding Employers Federations, respectively) and national trade unions and their federations (notably the Amalgamated Engineering Union and the FEST/CSEU respectively). Collective organisation was, however, voluntary, and far from comprehensive on both sides of the industry ([9]).

Although wage rates continued to vary by district, by 1919 changes were negotiated at sectoral level in both industries. Moreover, sector-wide procedure agreements in principle channelled disputed issues through a series of joint conferences, from works (factory) level through district level to national level. Only if the negotiators failed to agree at all levels did either side become formally free to take industrial action (Sharp, 1950).

Trade unions were entitled to request special conferences at national level in order to raise issues of industry-wide import. Between the wars the engineering unions attempted frequently to do just that for apprentices, as the latter remained outside procedure: employer representatives insisted that apprentices (and other youths) be exclusively their own charge, within a bilateral paternalistic relationship. The implication was the rejection of third party intervention by trade unions. The unions sought repeatedly the right to negotiate for young workers, a claim that the EEF refused even to discuss until forced by the 1937 apprentice strike movement to concede a procedure agreement for non-indentured junior manual males. That agreement was extended to all apprentices only in 1964, again following an apprentice strike.

By then, however, the industry-wide disputes procedures had been weakened. The processing of local issues by 'procedure' had been weakened during the First World War by the growth of factory-based shop steward organisation, workplace bargaining and unofficial strikes. Those developments were reversed by the unions' defeats in two sector-wide lockouts in 1922-23, and by the prolonged interwar slump. From the mid-1930s, however, workplace activism revived, often in defiance of both procedure and union officials. By the 1960s, the engineering industry could plausibly be depicted as undermining formal, industry-wide regulation by informal workplace bargaining. The principal symptoms were unofficial strikes, conducted outside formal procedure, and wage drift, with earnings rising more rapidly than minimum wage rates, as a result of local supplements ([10]).

([9]) Union membership density in the metal trades, which included iron and steel production, exceeded 50 % in 1920 but fell back to less than 25 % by 1932 and fluctuated between 50 and 60 % during 1945-70 (Bain and Price, 1980; p. 50). Membership density (by establishment) amongst engineering employers was estimated by Marsh (1965; p. 248) at 80 % among large firms (2 000 plus employees) but less than 10 % among small ones (less than 100 employees).

([10]) Donovan (1968), Hinton (1973), Croucher (1982).

4.3.2. Attributes

Apprentice strikes dovetailed in key ways with the wider industrial relations context. All were unofficial and unconstitutional, i.e. they were launched without official trade union approval (and sometimes in defiance of official instruction) and without prior recourse to any sectoral disputes procedure (though junior workers were not covered by the latter until the victory of the 1937 movement).

The disputes were notable for their timing, extent and duration. The 1941 and 1944 strikes breached, at two critical junctures in the war effort, the legal prohibition of industrial action and the associated requirement for compulsory arbitration (Croucher, 1982). More generally, as Figure 4.1 suggests, the timing of apprentice actions during the period was statistically unrelated to its adult counterpart. As to extent, the major apprentice strikes were multi-employer and multi-district (albeit not strictly industry-wide). Standard all-employee, multi-employer disputes involving adult employees were usually launched from the top by national officials, but apprentice movements were promoted from the bottom by ad hoc apprentice strike committees. The strikes continued for a matter of weeks, not just hours or days, although individual apprentices and factories were often involved for only hours or days.

The unofficial status of apprentice strikes partly reflected the weakness of the links between unions and young workers, most of whom were not members of unions, at least at the start of the dispute. Some youth disputes were, however, sanctioned retrospectively by unions' executive committees, if only *de facto*, through the decision to grant or withhold strike benefit, as by the AEU in 1937, 1952 and 1960.

Apprentice strikes showed a pattern of limited and volatile participation, with a high share of non-strikers and a high turnover of strikers during the dispute. A local employers' association reported during the 1952 strike that 'everything is very fluid and no sooner do you get a number of lads back in one factory than another set of lads go on strike somewhere else' ([11]). Such conditions appear to have been the norm. Fully one-third (32.7 %) of the 7 900 trade apprentices in federated engineering firms in Scotland took no part in the 1952 strike ([12]). In the eight strike movements during the period, the average participant was out on strike (allowing for non-working days) for only one-third of the overall duration of the movement (Table 1, columns 6 and 9).

Similarly, most of the apprentice organisations formed to promote and conduct the strike proved ad hoc, localised and ephemeral. At the same time, the organisational achievements during 1937-42 of the Clyde Apprentices' Committee were impressive. When union premises were not made available, meetings were organised variously at factory gates, on bombsites and in public parks, and strike headquarters established in the premises of Trades Councils, of other unions and of the Labour Party, and even (in Manchester in 1960) in a coffee house.

([11]) Manchester Engineering Employers' Association letter to EEF, 24.3.1952 (EEF case A(7) 275).

([12]) EEF case A(7)2.

Mass meetings of strikers, often held in public parks or on wasteland, and closely monitored by the police, played an influential part.

The strike was typically spread from district to district by apprentices themselves, travelling on foot, by bicycle, by motorbike, and even, in 1964, by aeroplane. The familiar tactics of mass picketing and the abuse of non-strikers – but rarely physical violence – were widely used to increase participation.

Finally, apprentice strike movements were promoted to some extent by left-wing politics. The importance of the contribution of young Communists to the strikes of 1937-44 is indicated by the political affiliations of many apprentice leaders (Fishman, 1995). The left-wing contribution was not always helpful to the cause, however. The weakness of the 1964 strike, as reflected in limited participation in Manchester and a weak response on the Clyde, reflected in-fighting between rival Communist-led and Trotskyite-led strike committees ([13]).

4.3.3. Strike demands

The primary demand of apprentice strikers throughout the period was higher pay, for junior males in general, and apprentices in particular. Only in the 1944 anti-conscription dispute did pay fail to feature. Despite widespread criticism of training quality, improved training remained a secondary issue.

The dominance of pay amongst apprentice demands increased during the period. The three post-war movements pursued claims that involved pay only, whereas those of 1937, 1939 and 1941 had focused on a wider set of issues, as expressed by the Apprentices' Charter formulated by the Clyde strike committee in 1937. The Charter called not only for higher pay and district-wide age-wage minimum pay scales, but also for apprentice rights to both part time technical education (under day release) and union representation, and for a 'reasonable' proportion of apprentices to journeymen (adult craftworkers). Although demands for improved training featured in all three strikes, they disappeared thereafter, as also in union claims on behalf of apprentices in national bargaining.

In the case of unions, the bias towards 'pay only' claims for apprentices may have reflected the difficulty of enforcing such clauses in collective agreements, given the difficulty of monitoring work-based training (Ryan, 1994; 1999). For apprentices, interest in training content did not actually vanish after the war. The AEU's annual Youth Conference regularly passed at least one resolution calling for more or better apprentice training. Unofficial apprentice organisations also showed some interest; a youth right to paid day release for technical education featured in the revised version of the Apprentice Charter proposed by a National Apprentices' Conference in Glasgow in 1952 (CAYC, 1952).

([13]) EEF case Z65/68 (52); Clyde Shipbuilders' Association case TD 241/12/359.

Nevertheless, apprentice strike leaders set their sights primarily or only on higher relative pay ([14]). Their choice of priority may have a simpler explanation than in the case of national union claims. Taking a short-term perspective, apprentices may have preferred 'more pay now' to 'more skill now and (maybe) more pay later' ([15]).

4.4. Interpretation

How seriously should apprentice strikes be taken? Like student strikes, they may have simply represented outbursts of frustration, energy or political activism that caused employers – much like educational institutions faced by student strikes – inconvenience but no serious damage. In that case, apprentice actions would be of interest for the sociology of youth, but should be confined to the footnotes in histories of both industrial relations and vocational training. Alternatively, apprentice strikes may have imposed serious costs on both parties, and should accordingly feature in mainstream histories of both fields. Economic theory, the attributes of apprentice disputes, and training practices all potentially inform the choice between the alternative interpretations.

4.4.1. Economics of bargaining and training

The possibility that apprentice strikes had little economic effect is at first glance consistent with both bargaining theory and the economics of apprenticeship. The central issue in bargaining theory is the damage that workers can effectively threaten to impose on their employers, relative to the losses they can expect to suffer themselves in the event of a dispute (Muthoo, 1999). In work-based training for skills that are valued by other employers beside the one providing the training, economic theory predicts that the employer who provides training will bear part of its cost by paying trainees more than the value of their net output during training (Stevens, 1994a; Acemoglu and Pischke, 1999). An apprentice strike then increases the employer's profit, in the short-term at least, as it reduces apprentice payroll costs by more than the value of apprentices' net output. It also makes apprentices worse off, as a result of loss of earnings while on strike. Under such conditions, the strike threat is empty. The employer should simply shrug it off, and even respond with a more credible threat – to fire any apprentices who go on strike ([16]).

([14]) Other apprentice demands concerned conscription, representation rights and the transition to skilled status, all of which proved marginal and ephemeral.

([15]) Thus James Hunter, Secretary of the Clyde Apprentices Committee in 1937, told the Court of Inquiry into the 1941 strike that the strikers had indeed wanted improved training, but 'the question of training was – not absolutely washed out, but when the committee came to the conclusion that the primary demand of the apprentices was the question of a wage increase, we concentrated on that' (PRO file LAB 10/509).

([16]) These results apply when competition for skilled labour is imperfect (oligopsonistic). Under perfect competition (general skills), the employer incurs no training costs (Becker, 1974) and therefore cannot be damaged by an apprentice strike, apart from any costs of rescheduling work during the dispute.

Apprenticeship training may, however, operate differently. If employers possess market (oligopsony) power over apprentices rather than over skilled employees, they can pay their apprentices less than their net marginal product during training. One way to do so is to pay low wages and provide little training, e.g. by offering no off-the-job instruction and restricting on-the-job training to specialised semi-skilled production tasks. The employer then exploits the apprentice rather than investing in his or her skills.

Under such conditions, an apprentice strike threat is potentially serious. An apprentice strike now involves not only lower output, depending on the ease of replacing youth by adult labour, but also lower profits: even were it easy to replace apprentice strikers by adult workers, the latter would be more expensive, even for given output. An apprentice strike then damages the employer ([17]).

Economic theory does not indicate whether the 'empty threat' or the 'real damage' interpretation of an apprentice strike is the more appropriate, but it does establish the conditions under which each is potentially relevant. Evidence can therefore be sought from the attributes of both apprentice strikes and training programmes.

4.4.2. Apprentice traditions

Some attributes of apprentice actions point toward the 'empty threat' interpretation. First, there is the potential link to the apprentice traditions of licensed absence from work, skylarking and riotous behaviour in medieval and early modern Britain (Lane, 1996). Under industrial apprenticeship these traditions appear to have converged on the Shrove Tuesday (*Mardi Gras*) 'holiday' ([18]). Thus, as late as 1950 apprentices in a large modern factory in Oldham were allowed to leave work at 10 a.m. in order to spend the rest of the day as they wished without loss of pay. They were actively encouraged to leave work by ritual teasing and 'blacking' by adult workers of any apprentice who proved slow off the mark. Employers had long tried to suppress such practices, and had enjoyed some success during the war, but the resilience of these traditions is suggested by the Oldham case ([19]).

Second, the timing of apprentice strikes is suggestive. Five of the eight actions started within six weeks of Shrove Tuesday ([20]). The sample is small, but the marked seasonality of youth actions may reflect the influence of tradition. Alternatively, it may simply be that of pent-up hibernal youth energy.

([17]) The potential sources of oligopsony power over trainee labour include involuntary unemployment, employer collusion, imperfect apprentice information about training content, and low rates of collective organisation and bargaining coverage (Ryan, 1994; Malcomson et al., 2000).

([18]) 'The day was usually kept as a holiday; games of football were common, together with throwing at cocks, and all sorts of horseplay took place in schools, universities and among apprentices' (EB, 1970).

([19]) PRO file PIN 62/348.

([20]) Two of other three strikes were prompted by an external shock: postwar wage cuts (1921), military conscription (1939). One left-wing faction attempted to postpone the autumn 1964 strike until April 1965.

Third, apprentice strikes were often marked by youthful exuberance. Jimmy Reid, Secretary of the Clyde Apprentices' Committee during the 1952 strike, later recalled that the apprentices had 'organised all sorts of fantastic stunts' ([21]). The 1960 strike was spread in Manchester by a 700-strong apprentice procession, marching around the district, singing and shouting, following the 'storming' of the gates and the apprentice school at the Metropolitan-Vickers factory ([22]).

Though much more needs to be known about the links between apprentice strikes and apprenticeship traditions, these attributes favour the 'empty threat' interpretation, in which the strikes should have had little or no economic impact.

4.4.3. Training attributes

The other attributes of the strikes and apprenticeship, point mostly towards the 'real damage' interpretation. The list starts with the attributes of apprentice training itself.

Training for craft and technician occupations in metalworking depended throughout the period primarily on apprenticeship. The content of apprenticeship varied by time and place. Legally, it involved a fixed-term contract under which the employer undertook to teach the relevant trade, provide continuous employment and pay a training wage, the apprentice to serve faithfully, protect trade secrets, etc. In practice, however, it typically involved only an informal verbal contract, and not a written contract or an indenture. Various attributes point towards a low average quality of training. Training practices were mostly limited to informal on-the-job training in practical skills: only a minority of apprentices received technical instruction, even after 1945 ([23]). In interwar engineering, the exposure of apprentices to layoff in downswings was similar to that of skilled adults; apprentices actually outnumbered journeymen (skilled craftworkers) in some districts; and apprentices were commonly laid off on completion at age 21, when they became – more or less – entitled to adult pay rates. As late as the 1960s, more than two-fifths of engineering apprentices worked under payment-by-results, paid at piece prices lower than those received by adults. Some employers did sponsor all-round training, and even include technical education, but the practice had not become widespread, despite the post-war recommendations made by the EEF and the SEF to member firms to provide day release to all apprentices less than 18 years old ([24]).

Under such conditions, it was not surprising that employers were regularly criticised – by apprentices, trade unions, educators, public commentators and even some employers

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([21]) EEF case A(7) 275.

([22]) 'Apprentices storm works: singing 700 hold up traffic', *Manchester Evening News*, 29.4.60.

([23]) In 1925, only 21 % of employers gave their apprentices time off for technical education and only 2 % had a works training centre or employed specialised instructors to train apprentices (Ministry of Labour, 1928; Vol. 6, p. 38 et seq.). See also Williams (1957), Liepmann (1960) and Sanderson (1994).

([24]) EEF cases A(7)330, A(12)36, Z67(590); Gollan (1937), Elbaum (1989), Ryan (1986, 1999), Sanderson (1994), Hart (2001).

themselves – for using apprentices as cheap labour, at the expense of their vocational preparation ([25]). Nevertheless, government did little about apprentice training until the end of the period. Pre-1939 Governments largely ignored the issue. Wartime and post-war Governments showed more concern, but opted for collective self-regulation by joint bodies of employer and employee representatives. Poor results led to the creation from 1964 onwards of the Industrial Training Boards, empowered to tax all employers of skilled labour and to subsidise those who provided training, but their effects started to come through only at the end of the period (Senker, 1991; Marsden and Ryan, 1991).

Concerning pay, apprentice wage rates were, until 1937, determined locally and unilaterally by employers. Consistent with the oligopsony interpretation (above), in both sectors local employers' associations recommended maximum apprentice wage scales, specified as percentages of the locally negotiated minimum wage rate for skilled workers. The maximum rates payable under those scales were low: in the five largest local associations in engineering in 1936, 20 % of the adult craft rate at age 16, rising to only 45 % at age 20 (typically the first and last years of apprenticeship respectively). During the interwar years many firms paid their apprentices even less ([26]).

During the period, therefore, apprenticeship training was sufficiently heterogeneous to contain pay and training practices compatible with both the 'empty threat' and the 'real damage' interpretations of an apprentice strike. The situation of the majority of apprentices was, however, more consistent with the latter than with the former.

4.4.4. Effects on and reactions of employers

Systematic evidence is not available concerning the effects of apprentice strikes on output and profits, and what evidence there is proves mixed.

In some cases, little damage appears to have been done, particularly in factories at which only a minority of apprentices participated, or the action lasted only a few hours or days, or part of the time lost by strikers involved day release spent at technical colleges. Limited damage is also suggested by the tendency of some employers to describe apprentice strikers in paternal, tolerant and even affectionate terms, as in 1921 when two Clyde shipbuilding firms that had had 'a large number of apprentices on strike' reported that 'with the exception of a few lads' all had accepted the wage cuts that had triggered the strike and returned to work ([27]). A light touch can also be seen in the informal meeting and 'sing-song' in the canteen with which the factory manager at Metropolitan-Vickers in Manchester persuaded a column of 1 200

([25]) Employers' use of apprenticeship for cheap labour suggests a strategic preference for the intensification and cheapening of labour within existing methods of production rather for the production of high quality products by highly skilled labour (Zeitlin, 1983; 1990; Gospel, 1992).

([26]) Surveys of members by the Clyde Shipbuilders' Association showed that in both 1924 and 1933 'a large majority of firms were paying below the maximum rates' (CSA file TD 241/12/231).

([27]) NWETEA Circular Letter 21-408, 11.10.1921.

protesting apprentices to stay in during the 1937 strike, and even in the management decision at a Birkenhead factory in 1952 to turn the fire hoses onto an apprentice meeting ([28]). Such features point more to the 'empty threat' than to the 'real damage' interpretation of apprentice actions.

Nevertheless, damage could be caused – and often was. The leading instances are the 1941 and 1944 strikes, which held up urgent war production. The Government set up a Court of Inquiry to help settle the 1941 dispute because 'essential government work was delayed by these stoppages' ([29]). The services of 18-20 year old apprentices were then of particular value, given that many were required to train and supervise the female dilutee workers on whom the expansion of war-related output depended. Less dramatic but still marked effects were also visible in some peacetime strikes. In both 1939 and 1952, e.g. press reports suggested growing effects on output as the strike proceeded ([30]).

The scale of the damage depended partly on the reactions of adult workers. Just as the effects of an adult dispute could be offset by the use of non-striking apprentices ([31]), so during an apprentice strike employers might seek to use adult employees to compensate for the loss of apprentice labour ([32]). Adult workers might, however, resist and even help the striking apprentices. Adults' options when it came to sympathy action included the blacking of apprentice work, i.e. refusal to complete work that had been started by apprentices or would normally be done by them, as widely reported in Glasgow in 1952, e.g. Adult employees might also boycott apprentices who refused to go on strike, or even put pressure on them to go out, as in Sheffield in 1960. Finally, they might, themselves, strike in support of the apprentices, as on the Clyde in 1937 and 1952.

The extent and effects of sympathetic action by adults are difficult to gauge. The EEF received from its local associations many reports of blacking at factory level, some of it encouraged by trade unionists, both shop stewards and full-time officials, but the representativeness of those reports is not clear. Sympathy strikes by adults were rare, brief, and less than solid, as notably in the case of the one day strike on the Clyde in April 1937, in which only one half of adult employees participated ([33]). A strike by 600 adults at two Glasgow firms in 1952, called in

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([28]) Leeson (1973; p. 159), Frow E. and Frow R. (1983).

([29]) *Ministry of Labour Gazette*, June 1941, p. 117; PRO file LAB 10/138.

([30]) *Manchester Evening News*, 3.6.1939, 20.3.1952.

([31]) Non-striking apprentices and foremen had helped employers to win the 1922 lockout in the engineering industry (Ryan, 1986).

([32]) Knox (1984, p. 32) concluded from an earlier (1912) failed apprentice strike movement that 'apprentices had only irritational value as disrupters as long as the adult workers remained at their benches'.

([33]) Half (49.8 %) of the 54 739 adult manual males employed by members of the Glasgow district engineering and shipbuilding employers' associations participated in the 16 April 1937 sympathy strike (*Minute Books*, North West Engineering Trades Employers' Association, 21.4.1937, and Clyde Shipbuilders Association, 22.4.1937).

response to the suspension of apprentice participants in the initial token strike, did shut down one of the firms ([34]).

The effects of apprentice strikes depended also on the employers' own reactions. Although firms tended to dismiss apprentice strike threats, once a strike movement got under way most employers proceeded cautiously, fearful of extending it, particularly by provoking sympathy action by adults. Employers' associations typically suggested to members undergoing an apprentice strike that they refuse in principle to negotiate with any unofficial strike committee, and also with union officials until a complete return to work had taken place. But they also advised firms to avoid any exemplary punishment of apprentice strikers. In 1960 the EEF advised members to write to apprentices and parents to remind them that 'participation in the strike is a breach of the Apprenticeship Agreement, rendering the Agreement liable to termination.' Beyond making that vague threat, firms were advised only to refuse to pay strikers for time spent at college on day release during the dispute, and to extend periods of service to reflect time lost while on strike ([35]). In some strikes, including that on the Clyde in 1960, firms were explicitly urged not to allocate apprentice work to adult employees and not to discipline apprentices when they returned to work ([36]).

Some employers ignored their associations' advice, notably by taking the hard line expected under the 'empty threat' interpretation and suspending or firing their striking apprentices. In Manchester in 1952, R. Broadbent & Co. sacked the seven of its eight apprentices who had joined the strike. Such reactions tended to backfire, in contradiction to the empty threat scenario. In the face of the Broadbent firings, the local apprentice strike committee refused to recommend a general return to work until the firm had reinstated all seven strikers. The firm climbed down one week later, and the strike committee voted within 24 hours to end the strike ([37]). Similarly, in 1960, the suspension by some Clydeside firms of apprentices who had participated in the initial token strike had, within three days, precipitated an estimated 90 %-solid indefinite strike across the district ([38]).

The efforts of employer representatives to secure a return to work were usually focused on union officials, whom they typically pressed urgently, at both national and district levels, to encourage or order such a move. Such exhortation, taken early and, on that occasion, welcomed by district officials, helped hamper the spread of the 1964 strike from Manchester to Glasgow ([39]).

In sum, the evidence suggests widespread employer concern over the implications of apprentice strikes for output and profits, particularly when the dispute proved prolonged,

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([34]) *Evening Citizen*, 8.2.1952

([35]) Circular Letter 119, 9.5.1960 (EEF case A(7) 330).

([36]) CSA, *Circular Letters*, 1960, #60-156.

([37]) *Manchester Evening News*, 19.3, 21.3, 27.3.1952.

([38]) NWETEA letters to EEF, 21.4, 24.4.1960 (EEF case A(7)330).

([39]) EEF, *Circular Letters*, 1964 (#253,254) and 1965 (#25); CSA case file TD 241/12/359.

when adult workers were drawn in, and in wartime. In other cases, employers showed only limited concern over the actions and antics of apprentice strikers. Pending more evidence on the issue, a provisional conclusion might be that the 'real damage' interpretation has considerable relevance to apprentice strikes as a whole, even if the damage done to most employers was limited by partial and volatile apprentice participation and the reassignment of apprentice work to adults.

4.4.5. Effects on pay structure

A final pointer towards the 'real damage' interpretation of apprentice strikes is evidence that most of them achieved their objectives, at least in part. Although all eight movements ended with a return to work – whether coordinated by the strike committee or simply as a result of the decisions of individual strikers – on the same conditions, district or national, as before the start of the strike, that did not necessarily indicate failure. The four largest strikes, those of 1937, 1941, 1952 and 1960, saw work resumed on the understanding, conveyed to the apprentices by union officials, that employers would soon thereafter resume stalled national negotiations with the unions on their claim for higher apprentice pay ([40]).

The effects of apprentice strikes, with their orientation towards increased pay, should therefore be visible in changes in apprentice pay structures. As Figure 4.2 shows, after the mid-1930s, seven increases in age-wage scales more than doubled the percentage rates payable at all ages: e.g. the rate for an 18 year old apprentice rose from only 30 % of that of a skilled adult in 1937 to 67.5 % by 1970. An apprentice strike movement, combined with national negotiations by trade unions, preceded most of these increases in relative pay rates.

The correlation between apprentice militancy and increased relative pay is far from perfect. The strikes of 1939 and 1944 failed to elicit any concessions. Nor can the scale increases of 1943 and 1970 plausibly be attributed to any prior apprentice action. However, the scale increases that followed five strikes – those of 1937, 1941, 1952, 1960 and 1964 – can be partly attributed to apprentice activism.

4.5. Conclusion

A neglected aspect of the histories of industrial relations and vocational training in the UK is the high strike propensity of engineering and shipbuilding apprentices. During the five decades considered here, apprentices undertook eight strike movements, drawing thousands of young males into conflict with many employers in a variety of districts for weeks at a time.

([40]) The 1939 and 1944 strikes both failed partly because they were directed against conscription-related Government decisions, taken under near-war and war conditions respectively.

The interpretation of these strike movements is not straightforward. From one perspective – termed here the 'empty threat' interpretation – they continued a historical tradition of youthful exuberance and licensed misbehaviour but lacked economic implications. From that standpoint the strikes are of interest for historical sociology, but not for industrial relations, economics or vocational education. From the alternative standpoint – termed here the 'real damage' view – the disputes represented serious industrial conflict, with implications for industrial relations, industrial training and education alike.

The heterogeneity of circumstances and practices in metalworking apprenticeship during the period means that support can be found for both interpretations. At the same time, various strands in the evidence – on training practices, effects on production, employer responses, and effects on pay structure – suggest that the strikes involved real conflicts of interest, and often caused real damage to employers. A final consideration is the disappearance of apprentice strikes after the 1960s, which suggests that, once the engineering training boards (ITBs) had raised training standards, the apprentice strike threat had finally become an empty gesture.

The wider implications of apprentice strikes lie outside the scope of this paper, but some can be noted in closing. The cumulatively large increase in age-wage scale rates to which they contributed removed from apprenticeship its traditional stigma as cheap labour. They also helped to destroy the self-serving sham that was the employer's insistence on its unilateral responsibility for the apprentice. Their implications for vocational training were less direct but less favourable. The upward trend age-wage scales increased the relative payroll cost of apprenticeship, creating an incentive to employers to shrink their apprenticeship programmes, thereby contributing to the decline of apprenticeship ([41]).

The importance of apprentice activism was recognised obliquely, as its heyday came to an end, by a union leader who generally showed it little sympathy. Sir William Carron, AEU President, remarked in negotiations with the EEF in 1963 over the unions' renewed claim for higher apprentice pay scales that:

'… it might be a coincidence, or it might not be a coincidence, but on each and every occasion, so far as we can recall, when apprentices have felt themselves impelled to take this course, something has been done about the problem which was not done prior to this kind of thing happening' ([42]).

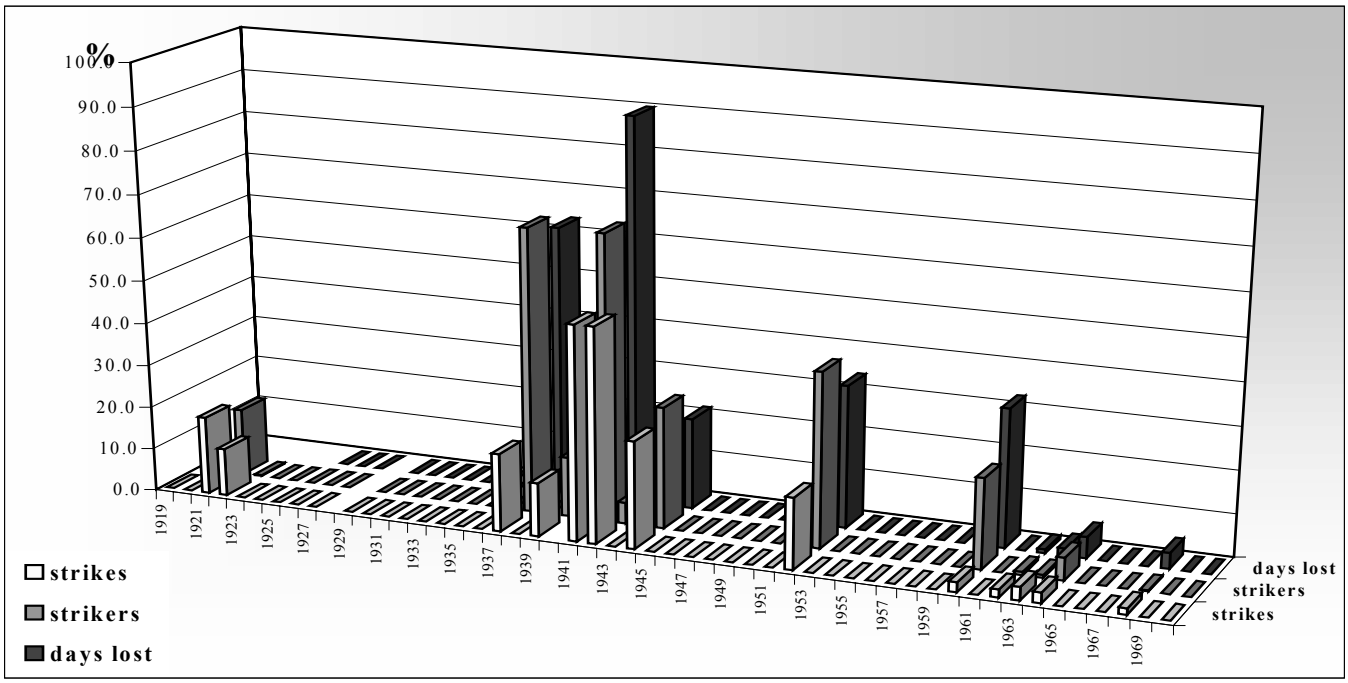
His allusive terminology may well have reflected the discomfort that apprentice activism induced on both sides of the negotiating table, but his tribute to apprentice activism rang true.

([41]) Lindley (1975), Marsden and Ryan (1991), Stevens (1994b), Gospel (1995), Ryan (2001), Ryan and Unwin (2001).

([42]) EEF, *Minutes of Central and Special Conferences*, 31.10.1963.

Annex: data sources

Figure 4.1: Youth shares of strike activity, principal disputes only, UK engineering and shipbuilding, 1919-69 (%)



Source: Ministry of Labour Gazette, monthly reports (1919-24) and annual summaries (1925-70).

Principal disputes in engineering and shipbuilding by category of:

- workpeople involved (apprentices, boys and youths; others):
- number of strikes;
- number of strikers;
- working days lost.

Figure 4.2: Attributes of apprentice strike movements, UK, 1919-69

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Year	**Period**	**Sectors**	**Districts involved [g]**		**Duration**	**No of strikers**	**Working days lost**	
		(day. month)		**Outbreak**	**Participation**	**(calendar days) [e]**	**('000)**	**Total ('000)**	**p.c. [f]**
1	1921	27.6-4.7;28.9-12.10	E, S	Manchester Clyde	Manchester Clyde	33	6.5	72 [a]	11 [a]
2	1937	27.3-4.5; [b] 6.9–30.10	E, S	Clyde Manchester	Central Scotland, N. Ire, N. England, Coventry, London	94	32.5	406	12
3	1939	18.5-3.6	E	Clyde	Clyde (only)	16	2.2	19	9
4	1941	28.2-5.4	E, S	Clyde	Central Scotland, N. Ire, Manchester	37	25.1	220	9
5	1944	28.3–12.4	E, S	NE Coast (Tyne)	NE Coast Clyde, Hudd	16	17.0	150	9
6	1952	10.3–2.4 [c]	E, S, M	Clyde	Scotland N. England, N. Ire	24	16.4	194	12
7	1960	20.4-16.5 [c]	E, S	Clyde	Scotland, N. Ire, N. England, Coventry London	27	36.9	347	9
8	1964	2.11 -25.11 [c]	E	Manchester	N. England Clyde	23	6.0	26	4
	Mean [d]					34	17.8	179	10

NB: Sectors: E, engineering; S, shipbuilding; M, metal manufacture. Where sources differ, Ministry of Labour estimates are preferred.

Source: Annex; Croucher (1982); EEF and SEF archived case files

[a] average time on strike assumed to be 25.7 % of dispute duration (unweighted average of 1937-64 strikes)

[b] excludes one day sympathy strike by adults on Clydeside

[c] excludes prior token strikes lasting one day or less

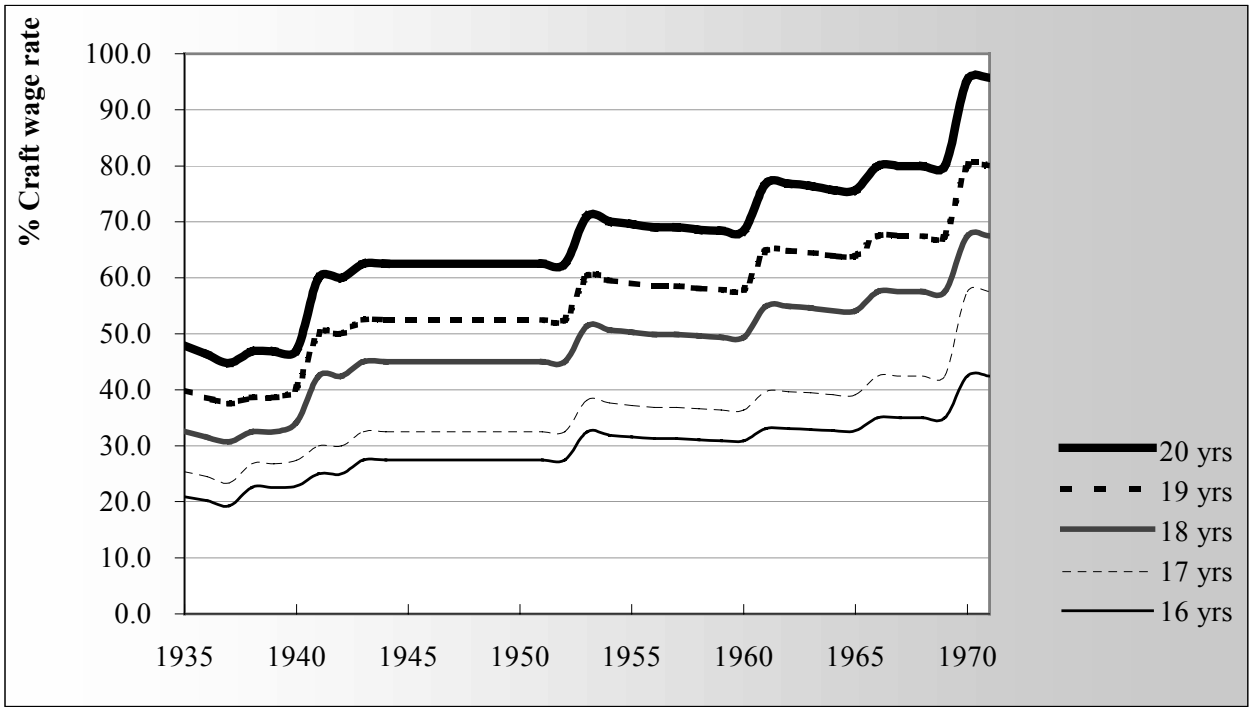
[d] unweighted arithmetic average

[e] from col (2)

[f] (8)/(7)

[g] Clyde: Glasgow and west central Scotland; Central Scotland: same, plus Edinburgh and Dundee; Scotland: same, plus Aberdeen; N. England: South Lancashire and South Yorkshire; N. Ire: Belfast.

Figure 4.3: Apprentice age-wage scale rates, UK engineering (EEF), 1935-71



Source: Ministry of Labour and National Service, Time Rates of Wages and Hours of Labour, annual.

Wage rates of apprentices and craft workers.

- Craft rates: weekly minimum consolidated time rates for fitters, except foundry workers, April: 1951-67, average of district rates for large districts (Manchester, Birmingham, etc.); 1967- : minimum national rate.

- Age-wage scale rates by age: apprentice fitters, except foundry in EEF member firms, April: 1935-41, estimated from locally recommended apprentice maximum rates in the five EEF Associations employing the most apprentices (NE Coast, North West [Glasgow], Manchester, Birmingham and London); 1941-50, scale rates in 1941 and 1943 EEF/AEU wage agreements; 1951- : age-wage scales, mechanical engineering.

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5. Vocational training in French schools: the fragile State-employer alliance

Vincent Troger

A feature of the system of vocational training in France today is the extent to which that training is provided in State school and colleges. Two types of vocational education and training (VET) provision – the *lycées professionnels* (vocational lycées) and the technological streams of the general lycées – are the destination for almost half of the young people in France coming to the end of compulsory schooling: one million go on to these options, compared with a million going on to the academic streams within the lycées. In contrast, relatively few youngsters of the same age – approximately 300 000 – are accepted for apprenticeship training in the workplace.

The purpose of this paper is to describe the thinking that led to this constellation, starting at the end of the 19th century. The first part outlines the main trends in the history of vocational training since the French Revolution up to the major reforms of the 1960s. The second is a more detailed analysis of what has happened since then.

This brief analysis shows that the system of vocational training of young people, in the form specific to France, has been built up only gradually in response to the problems that arose in similar terms in every industrialised nation. It highlights the decisive role of the special historic situation in the 1950s and 1960s that led to General De Gaulle coming to power, and with him, the leaders and elites who brought with them a particularly interventionist and centralising vision of the role of the State. In this respect, France's exception to the general trend was also an exception within France's own history since World War I.

5.1. Technical and vocational education from the French Revolution to the Fifth Republic

The history leading to the contemporary organisation of vocational training for young people in France starts with the abolition of corporations – in other words, guilds – in 1791. The disappearance of this traditional setting for organising apprenticeship training triggered off what was called a 'crisis of apprenticeship', one that was to last throughout the 19th century and up to the First World War. In fact the term described three different situations:

(a) the decline of traditional apprenticeship training in craft trades, in line with the decline of those trades themselves. This is still a topical issue today: the sectors that have preserved the traditional apprenticeship arrangement, such as the food trades, hotel and catering and part of the building industry, still complain about the shortage of apprentices;

(b) the deterioration in the working conditions of young people, and sometimes of children, who were exploited in the industries using manual labour, essentially textiles and mining;

(c) the shortage of skilled labour in the more modern industries, i.e. mechanical engineering and, from the end of the 19th century, electrical engineering.

The exploitation of child labour and the shortage of skilled manpower were the focus of concern for the political and economic elites throughout the 19th century. They responded in two ways: by developing primary education to teach and protect children, and by starting up technical schools and evening classes. Up to the late 1870s, France was not very different from other leading industrial countries in this respect. Many evening courses, either private or provided by philanthropic associations, workplace schools such as those set up by the Schneider or De Wendel factories, municipal schools (Paris, Le Havre, Lyons, Nantes, etc.) and schools financed by trade organisations (Besançon), offered technical training at varied levels. International exhibitions attracted several international congresses on technical education, especially at the end of the 19th century, providing an opportunity to show how more or less similar schemes were being introduced in Germany, Great Britain, Belgium, Russia and even South America. One of the common features of those initiatives was the low level of involvement of the State and the vital role performed by private and municipal bodies (Charlot and Figeat, 1985).

But two events were to bring about a lasting change in the status of vocational training for young people in France in the last quarter of the 19th century.

The first was the arrival of the Republicans in power in 1879. To stabilise what was initially a fragile regime they put their faith in compulsory schooling, with the aim of educating French youth in the spirit and values of the Third Republic and counteracting the Catholic church's hold over elementary education. But the Republicans had a problem: how to control working class youngsters, especially boys, once they had come to the end of compulsory schooling at the age of 13 and up to the age of military service at 18, or until marriage in the case of girls. Violence among working class youth was not a new issue: from the start of the century successive governments had been concerned with the problem. They feared that the youngsters would fall prey to idleness and crime or to revolutionary ideas. Initial vocational training was thus seen as a way of maintaining order among these young people while meeting the needs of industry and trade.

This project was to provide a solution to the concerns of some of the employers, those at the head of the more modern companies. Mechanical and electrical engineering were at the height of a boom, with the development of the petrol engine and the electric motor and the consequences for road vehicles, aircraft, the navy and railways. As a result they needed skilled manpower in domains calling for new and hard-to-find skills. These sectors were also strategic, since they supplied the armed forces with equipment at a time when the first great world conflict was looming.

Part of the Republican political elite and some of the employers were to form an alliance and create what historians in the English-speaking world who have studied this question have called a lobby ([43]). This was to work towards establishing a vocational training policy with two objectives (Pelpel and Troger, 2001).

The first was the development of technical schools funded jointly by the State and by local authorities. The schools selected from among the best pupils in elementary school those whose social origins meant that they would opt for a short period of training leading straight to stable occupations. They trained highly skilled workers for industrial concerns, who then rose rapidly to become foremen or skilled technicians, the best among them acquiring the status of engineers (Legoux, 1972).

The second objective was to bring in legislation to regulate the training of blue- and white-collar workers and to ensure that those employers bearing the cost of apprenticeship would not be at a disadvantage compared to others not making the effort to train their workers. For example, a diploma attesting occupational skills, the *Certificat d'Aptitude Professionnelle* (CAP), was created in 1919 (Brucy, 1998), theoretical training courses were made compulsory for apprentices, and in 1925 an apprenticeship tax ([44]) was levied on enterprises that did not train apprentices.

The latter initiative was directly inspired by what was happening at the time in some of the German *Länder*, and especially in Alsace-Lorraine, which had reverted to France in 1918.

Overall, this policy continued to be inspired by liberal thinking. The technical schools were devoted to training an elite of highly skilled workers, while the laws on the CAP and the apprenticeship tax, which applied to the training of a majority of workers, were essentially in the nature of incentives. Apprentices were not under an obligation to sit for the CAP, and the conditions for exemption from the apprenticeship tax were not very stringent. A head of technical training stated in 1923 that the State saw itself only as the 'consultant engineer to private initiative'. The same official drew extensively on the German example and developed a policy of enticement for enterprises and employers' association, with the essential aim of establishing an active partnership with these parties. Before the Second World War, French policy on vocational training, therefore, had not yet evolved towards a more original model. Policy on schooling in the Third Republic continued to have only a marginal influence, and efforts were essentially directed towards encouraging employers to take more responsibility, by explicit reference to certain German schemes.

The first objective was successfully achieved: by the eve of the Second World War, several dozen technical schools were catering for nearly 100 000 pupils, a school population almost as

([43]) This lobby has been described in particular by two British historians, Roger Fox and George Weisz, (Fox and Weisz, 1980).

([44]) This tax, calculated as a proportion of each enterprise's wage bill, is still levied today and represents a not insignificant source of funding for many vocational and technical education establishments.

large as that of the lycées. The second objective, on the other hand, was not attained at the same time. Very few apprentices enrolled for the vocational courses or sat the CAP.

It was the failure of the second objective that was to lead to the creation of a second type of vocational school, what are now called *lycées professionnels*, with the aim of training not technicians or foremen but shop-floor and clerical workers. During the Second World War, the Vichy Government had set up training centres to take in unemployed people from the working classes and inculcate in them a Pétainist ideology. In 1944, these centres were taken over by the new government and, with the support of the employers in the metallurgical industry, represented by a powerful employers' association, the *Union des Industries Métallurgiques et Minières*, they became public vocational education establishments (Pelpel and Troger, 2001). This time, there were two factors motivating the agreement between the State and the employers: post-war manpower shortages, since the generations now arriving in the labour market reflected the low birth rate in the first half of the century; and the need for national reconstruction after most of the country's infrastructure had been destroyed by bombing.

This agreement also reflected a change in social and economic relationships in French society. With the benefit of the prestige it had acquired by its active participation in wartime resistance, the French Communist Party exerted a strong influence at the time. This, combined with the influence of Keynesian theory on a large section of the new Government elite, became a justification for State intervention in every sector of social and economic life and was the reason for the adoption of a planning policy. A model of centralised and State control of vocational training started to gain ground in French society, turning back to absolutist, imperial times. Although the concept of the welfare state was spreading throughout Europe at the time, in educational matters it was to be on a wider scale in France than elsewhere.

From this date on, there were two parallel categories of public-sector technical schools in France: one providing training for those who would go on to work as middle management in enterprises, the other training future blue- and white-collar workers.

Up to the 1960s this system worked very well. It provided employers with shop-floor and clerical workers and with junior managerial staff who could be put to immediate use on leaving school. This meant that enterprises did not have to fund and organise the training effort themselves. The system offered students a rapid route to recognised qualifications, at a time when post-compulsory school education was still not very well developed. A historian has called the vocational education of the time a 'lifebelt thrown to the working class'. Technical education or vocational education diplomas had little competition from other diplomas in the labour market and, because of this, such education was highly regarded among ordinary people.

5.2. The devaluation of technical and vocational education

In 1959, General De Gaulle returned to power and embarked on a policy of modernisation in France. From the educational viewpoint, this policy was based on the assumption that there should be investment in human capital and therefore that the school population should be proportionately higher. From 1959 to 1975, there was to be a series of reforms pursuing a twofold objective. The first was to defer the point at which individuals made their final career choice by raising the school-leaving age for all: the culmination of this objective was the comprehensive school and a school-leaving age of 16. The second was to expand scientific and technical education: the scientific baccalaureate became a highly valued secondary education diploma, there was a proliferation in engineering schools and technical and vocational education was developed.

It should be pointed out that this policy was implemented in the context of a centralising concept that reinforced the trends that had already become apparent over the previous years. Two instruments were typical of this concept, and they differentiated France from other countries in this field: the school record card and a nomenclature of job levels. The school record card, first introduced in 1960, required families to choose a school according to where they lived. The nomenclature of job levels drawn up by the *Commissariat Général au Plan* – the Government economic advisory board for planning – in 1965 established a close correlation between the different levels of school diplomas and the various levels of qualifications in the labour market, in such a way as to channel the flow of pupils from secondary, technical and vocational education to meet the requirements of employers. There was nothing exceptional in the French policy of raising the level of schooling among the population at the time, since the pattern was the same in every other industrialised country, but the way in which it was implemented confirms the special nature of the French system, under which the State constantly strengthened the forms of centralised control and standardisation.

At first, technical and vocational courses benefited from these reforms, since they expanded to the point they have reached today, accounting for half of all lycée pupils. But very soon they also started to suffer from several side effects that were rapidly to transform them into what came to be regarded as a second-best stream of the French educational system.

The first factor was demographic. With the arrival in the labour market of the baby-boom generations at a time when few people in the older generations were reaching retirement age, it automatically became harder for young people to enter the working world from the late 1960s on. Far more people were seeking their first jobs than there were jobs released by retirements. The slowdown in economic growth following the oil crises of 1973 and 1975 considerably aggravated the problem: the resulting unemployment, combined with the relative scarcity of jobs created by retirement, made it very difficult for young people to find work.

Simultaneously, another process more closely linked to the development of the school system was to have adverse effects on technical and vocational education. The proliferation of

engineering and commercial colleges and the development of university-level technological education meant that enterprises and the administration could increasingly look to these sources for the future managerial staff and senior executives they needed. The effectiveness of this system, however, had a negative effect on the technical and above all vocational diplomas acquired in technical education, by making it increasingly difficult for skilled blue- and white-collar workers to gain access to more senior jobs through internal promotion ([45]). Increasingly, middle-ranking or higher-level jobs were being taken directly by graduates from the engineering and commercial colleges or the universities. When combined with the automatic effects of population trends, this process gradually created a bottleneck in internal workplace promotion, in a way creating competition between the internal recruitment market (promotion) and the external recruitment market (the hiring of young diploma-holders). To opt for technical and vocational education meant taking the risk of being locked into lower-ranking social status for the remainder of one's existence.

From the late 1970s, despite the rise in the number of people in technical and vocational education, this became the 'second-best' stream of schooling (Troger, 1996). As a result, families systematically tried to avoid the streams that might keep their children down to a lower-level working status, and a majority rejected guidance suggesting that this direction be taken, especially vocational education. Youngsters threw themselves into the race for diplomas, with the obvious multiplying effect. The more diplomas there were, the more each individual felt that a more advanced diploma should be sought.

Because of this, the intake of vocational education schools now consisted only of pupils who had reached the school-leaving age but had failed at school, whereas the technological streams took the pupils who, at the end of their secondary education, had not reached a high enough standard to continue their general education in the humanities, science or economics. There were only rare exceptions to this process: the courses preparing young people for careers still held in regard, such as the hotel and catering trades or applied arts for industry (industrial design). The situation has changed since the 1950s, when vocational education was relatively selective and took good or average-level working class pupils: today its intake consists of the group of youngsters who have encountered setbacks in their general school education.

This changing pattern of recruitment, however, has conflicted with another trend, the changes in the skills required in the labour market. Since the early 1980s, production of goods and services has been increasingly influenced by the demand for quality. The organisation of work is less determined by the material constraints of production, and increasingly by consumer demand. Commercial and marketing departments now dictate requirements to the production departments, a situation that is a reversal from 30 years ago. Public-sector services, which are highly developed in France, refer less to 'users' and more to 'clients'. For shop-floor and clerical workers and for junior and middle managerial staff this means that they are expected to have new competences in addition to essential technical skills. They are required to

([45]) In 1971, there was a law making it compulsory for employers to fund their employees' continuing training. But surveys have shown that it was mainly the managerial staff who benefited from such training.

communicate better, to adapt quickly to new situations, to master elementary computer skills, to take over responsibility for some of the customer relations work, etc.

Because of this, technical and vocational education has been forced to bring about a minor internal revolution. It has adapted its teaching methods to these new demands at a time when the educational standard of their pupils has been in decline. This evolution is evident in two fields.

The first has been the development of alternance training (Agulhon, 2000). From now on, all pupils in vocational education and some of the pupils in technical education will spend part of their period of schooling in work placements, which are taken into account in awarding their diploma. This applies in particular to a diploma created in 1985, the *baccalauréat professionnel* or vocational diploma. It has helped to narrow the gap between the training delivered in technical and vocational education and apprenticeship training, since apprentices receive theoretical training as well as working in their enterprise. Serious thought is also being given to combining this training as often as possible in the same establishments, which might be called *lycées des métiers* (trade lycées).

The second area of change has been the development of thinking on the content of training, taking into account the changing requirements of employers. What are called 'job reference' documents have been drawn up together with the representatives of employers and employees' unions, defining the set of competences sought by employers in each trade (Eckert and Veneau, 2001). These *réferentiels d'emplois* are then converted into *réferentiels de formation*, or 'training reference' documents that are used as a basis for implementing teachers' educational methods. These references are often criticised for being too detailed, which sometimes makes them difficult to apply to the letter. However, there is no doubt that the new approach has breathed fresh life into teaching methods in technical and vocational education and has helped to bridge the gap between the standard attained by pupils and the level of the skills they need to acquire.

In conclusion, I would say that technical and vocational education has today become a sort of 'safety valve' for the French educational system. It takes over half of French youngsters who have more or less failed in the comprehensive school, and its teachers have displayed imagination, determination and patience in offering them the training and additional education that will help them to obtain a diploma and enter the labour market on the best possible terms. In this, they are rendering service to the employers by relieving them of most of the cost of training.

Over the past few years, this system has been criticised partly for its cost and partly for its relative slowness in reacting to the changing demands of the labour market. Today, these criticisms are muted, first because technical and vocational education has achieved progress in its practices. Also, the model of apprenticeship, which has developed significantly in certain sectors in competition with school-based training, has nonetheless reached a certain limit: most enterprises and the French Administration have not acquired a true 'training mindset', unlike what has been happening in Germany. As a result there are often problems with taking

on apprentices, as there are with the placements of young people from vocational education. This is why we now feel we should be moving towards a sort of compromise: initial vocational education and training will no doubt continue to be provided in the school for a long time to come, but its practices will tend to move closer to those of apprenticeship, without making such heavy demands on enterprises as does traditional apprenticeship.

5.3. Conclusion

The methods of regulating the relationship between training and employment that have been in force since the early 1960s are probably changing significantly, in a way returning to the initial situation in the Third Republic. From a model in which the State control over training itineraries and methods of certification prevailed, the aim being the standardisation of resources, there is now a gradual return to more flexible forms of regulation. These are characterised by the diversification of training procedures and certification and by allowing employers, private initiatives and regional political bodies to perform a greater role. In this respect, France is undoubtedly coming closer to the approach to these issues adopted in Europe. Nevertheless French companies – unlike their counterparts in Germany – have long grown accustomed to relying on the initiative of the authorities to meet their training needs. Paradoxically perhaps, the effects on those companies of a return to a more liberal concept of vocational training as imposed by the European VET objectives will be all the more painful.

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6. Development of disparate structures of Dutch and German vocational education

Dietmar Frommberger, Holger Reinisch

Comparing the origins of vocational education and training (VET) gives an overview of the similarities and differences of the various systems. It also offers the chance to describe the different structures, to understand their diverse historical backgrounds and to gain insight into the reasons for these differences between European States. Comparative historical research in VET has hitherto been neglected, particularly in academic circles; few satisfactory findings are available. The following exposition, dedicated to filling this gap, draws on research conducted by the authors, though space restrictions dictate that only a summary sketch of results obtained in the historical comparison of the two chosen countries may be presented here. For further reading we recommend the quoted sources. Initially we focus on the development of vocational education in the Netherlands. The history of German VET can only be outlined. For further information on this subject we refer readers to the article of Deissinger in this volume.

6.1. Historical development of VET in the Netherlands

The outline of developments in initial and continuing training examines the tenets offered in *After the abolition of the guilds in 1798* (Wolthuis, 2001). This is analogous to the thesis that the diverse organisation of VET, and with it the differentiation between nation-States, was born of the 'crisis in vocational training' (Stratmann, 1967), i.e. with mercantilism, the fall of the feudal system and the perceived and/or actual dissolution of the guilds' occupational order.

The final blow to the Dutch Guilds was the French occupation; the Batavian Republic became the Kingdom of Holland in 1806, and in 1808, a French *département* under the rule of Napoleon's brother, Louis Bonaparte (Wiskerke, 1938). Although Napoleon's Waterloo soon returned independence to the countries now known as Belgium and the Netherlands, the structural transformation leading to deregulation of the trades – by virtue of the abolition of their hegemonial institutions – was already under way, and a change of policy was not effected (De Vries, 1984).

A historically reconstructed quest for explanatory indices of nation-specific VET structures reveals the significance of the 'intermediary power'. While in 19th and 20th century Germany a corporative body had managed to reassume a policy-making position (Section 6.2), interventionary powers in other nation-States such as the Netherlands were crushed. The French suppression of forms 'of effective intermediation between citizen and State' according to Schriewer (1986), represents the most extreme expression of the pan-European

confrontation with the dichotomy between nation-States and traditional, occupational fraternities. Dutch history is very much akin to French history in this respect.

The lack of implementational power of such interventionary authorities in VET-related policy has been associated with the development of school-based vocational training. This presumes that the existence of these interventionary powers elsewhere offered conditions propitious to work-related and experience-related VET or vocational training based partially in employment. Equally, it hypothesises that systematic, scientifically based school VET was not given due consideration. Stratmann (1988, p. 22) tries to explain why the full-time school system of VET established itself in such countries as the Netherlands (in contrast to Germany). He states that Germany's VET sector has always taken the prerogative of autonomy, despite the government's interventionalist rights, and thereby resisted all formal attempts to localise VET in schools.

Space considerations prevent a more extensive discussion and elucidation of the various VET systems' origin and development in Europe (see the somewhat broader comparison focusing on England: Frommberger, 2001a). Furthermore, little research has been conducted, and too little comparative history research findings are available, to permit an admissible deductive conclusion. For this reason we shall limit ourselves to a portrayal of major VET developments in the Netherlands, and subsequently contrast them to those in Germany, in order to formulate a few comparative hypotheses.

The failure to reanimate the guild structure in the Netherlands (Goudswaard, 1981; p. 10), necessitated alternatives to fill demand for skilled workers. Up to 1860, when belated Dutch industrialisation took off, this demand was filled either by foreign migrant workers (Brugmans, 1958; p. 88 et seq.) or diverse vocational training institutions such as the *industriescholen, werkscholen* and *avondtekenscholen* (Goudswaard, 1981; p. 91 et seq., 104 et seq. and Frommberger, 1999; p. 121 et seq.). In some regions, primarily in rural areas (e.g. in Drenthe), there were further initiatives to reinstate and systematise company-based VET, at least with regard to the duration of training, wage levels and compulsory evening school attendance (Santema and Maandag, 1991; Bruinwold Riedel, 1907).

Between 1860 and 1890 (North, 1997), the massive increase in demand for trained workers was accompanied by a great rise in educational facilities and VET opportunities. The founding of full-time vocational schools was doubled, particularly of those known as *ambachtsscholen* (Van Harderwijk, 1910). The establishment and operation of these craft trade and commercial technical VET schools was originally the work of various private foundations and interest groups such as *Maatschappij tot Bevordering der Bouwkunst* and *Maatschappij tot verbetering van den Werkenden Stand*; only in the 1870s did parishes, towns and provinces contribute to their upkeep. State subsidies increased towards the end of the 19th century as the imperial government decided to promote private schools, particularly denominational schools.

The *ambachtscholen,* a success story which closely resembled the German provincial trade schools of the day (Onnen, 1900; p. 148 et seq., Frommberger, 1999 for greater detail), offered an alternative to learning a trade through apprenticeship well into the 20th century.

These VET schools espoused qualifying artisans as their goal and also taught general subjects such as *schrijven, rekenen, taal- en stijlofeningen, algemene en vaderlandse geschiednis* and *aardrijkskunde* (writing, arithmetic, language and style exercises, general and Dutch history and geography), which were intended to be of general use in the pursuit of a trade.

Methodology was of great importance to the *ambachtsschool* from the early stages. The balance of theory and practice in both the didactic curriculum and the didactic methodological classes was particularly relevant to establishing school-based VET. The *ambachtsschool* walked the tight rope between commercial utilitarianism and the exigencies of theory-founded VET.

The *ambachtsscholen* won a recognised position in the Netherlands addressing a critical need for a new form of VET, which was aggravated by the lack of progress made in apprenticeship training. However, *ambachtsschool* training provision was never intended to replace the crucial practical on the job experience in a trade.

'A craft is not easily mastered. A sound foundation is laid in school, but the young hands who leave school at about the age of 16 still need more practice and experience. They are, however, well in advance of their peers who exclusively trained on the job, not only in their workmanship. but also in their theoretical knowledge of their subject.' (Van Harderwijk, 1910; p. 219) ([46]).

As the need for comprehensive, systematic VET grew, it became axiomatic in the Netherlands that a school-based form of occupational training was the most appropriate way to fulfil future requirements. Moreover, the *ambachtsscholen,* which constituted the cornerstone of school-based VET in the Netherlands, were endorsed by the parliament and government of the day, as well as by craft and trade bodies (Goudswaard, 1981; p. 197 et seq. and *passim* for discussion of the *ambachtsschool*).

A further significant step in the shaping of VET in the Netherlands was the foundation of the *Burgerdagschool,* which included extended general education and further postponed working life by two years. *Burgeravondscholen* operated along similar lines, but accommodated the need of the majority to work during the day by giving its theoretical instruction in the evening. Whilst the *Burgerdagscholen* failed in 1885, the only school still operating then was one in Leeuwarden, Frisia, (Goudswaard, 1981; p. 241 et seq.), the evening counterpart had considerably more success. They recruited at the already established *Tekenscholen* and *Industriescholen,* let their trainees attend school while holding jobs, and oriented themselves, contrary to the legislature's intention, towards specialist and industry needs (Meppelink, 1961; p. 76 et seq.).

Burgeravondscholen resembled the German Further Education schools. Onnen noted this similarity:

([46]) Authors' translation.

'Particularly in Germany, specialist training is organised in an entirely different manner than is common here. There the workplace is the primary site of training. The master craftsmen are subject to many regulations, as they are here, and it falls to the artisans to train their future colleagues. There are some accompanying theoretical day schools and numerous further training schools throughout the land. These further training schools, which can be subdivided into general and trade schools, are remarkably similar to our *burgeravondscholen*. They give exclusively theoretical instruction, and the classes take place in the evening and on Sunday morning. The subjects taught are generally the same as those offered by our *burgeravondscholen.*' [...]*'* (Onnen, 1900; p. 148 et seq.) ([47]).

Like the German further education schools, the Dutch *Burgeravondscholen* catered increasingly for the career interests of their trainees. Job-related material increased significantly despite the initial general education function of these establishments (Steyn Parve, 1872; p. 979 et seq.). This was the only way these Dutch schools could attract their clientele. The strategy, stressing sector-specific training, was therefore the same in both countries. In the case of the Netherlands, we cannot ascertain any function akin to that of the occupation-oriented further education schools in restabilising the social order within the imperial power structure as could be seen in Germany (Stratmann, 1992).

The *Burgeravondschool* remained an important institution for part-time studies among Dutch jobholders. In 1919 it lost its official general education function and was integrated by law into the VET system with the *Nijverheidsonderwijswet* (Second Industrial/Technical Education Act). The *Nijverheidsonderwijswet* of 1919 made the field of school-based VET into a government responsibility. Van Gelder (1919) is credited with publishing the first complete overview of trade education and training facilities in the Netherlands. His work, appearing early in 1919, addressed the *ambachtsscholen,* the *tekenscholen*, the *burgerdagscholen*, and the *burgeravondscholen*. In addition the *Leerlingswezen*, the *bedrijfs-* or *fabriekscholen* and *vakscholen* are also detailed. The last two categories were trade and job-specific schools preparatory to employment in large enterprises or sponsored by a given trade, respectively.

Van Gelder (1919), however, only concerned himself with the description of technical and trade-based training. His portrayal of VET thus ignored teaching in the flourishing commercial schools. Although this may seem peculiar to contemporary observers, the consensus of the era was that the demand for business managers was broadly filled by the already extant *hogere burgerscholen*, which were also expected to furnish general education as part of their brief (Idenburg, 1960; p. 227 et seq.). Although a number of less innovative commercial schools such as those in Amsterdam, Dordrecht, Maastricht and the first commercial university, founded in 1913 in Rotterdam, existed at the time, their advocates did not consider them VET institutions but rather liberal art schools. This position was strongly endorsed by the national *Vereniging voor Handelssonderwijs*, founded in 1899. Its official organ, the *Maandblad voor Handelssonderwijs*, vociferously argued against their provision of

([47]) Authors' translation.

VET (Hoksbergen, 1975; p. 9; Sleumer, 1938; p. 62; Bartels, 1963; p. 50 et seq.). The tendency to rank commercial training schools among general education establishments continued in the 20th century. By 1963, the *hogere burgerscholen* had finally been 'subsumed' into pre-academic training and general secondary education.

The first Dutch national VET law did not, therefore, include the commercial schools (de Groot, 1930; p. 24): The *Nijverheidsonderwijswet,* finally ratified in mid-1919, stipulated conditions for VET in the Netherlands and drew a demarcation line, at least in legal terms, between general and vocational training (for more information on the *Nijverheidsonderwijswet* cf. Frommberger, 1999).

Apprenticeship training integration into education increased the prestige of in-company training. An independent standardised programme was formulated and the preceding, often regionally limited apprenticeship scheme (viz. Drenthe) was replaced by a nationwide system. Nonetheless, school-based training remained more popular than in-company training:

'*In die streken, waar geen voldoende ambachtsonderwijs kan worden gegeven* [...]' here the concept of *ambachtsonderwijs* includes school-based instruction, it is therefore apparent to what degree in-company training was subsidiary '[...] *moeten wij alles doen om het sporadisch hier en daar bestaande leerlingwezen aan te moedigen*.' (de Groot, 1930; p. 19) ([48]).

Despite this restriction, the 1930 Minister for Education, Art and Science's statement in favour of standardising VET is clear:

'Apprentice training is underdeveloped in our land. With this statement I do not wish to belittle the many people in Drenthe and in West Frisia who have contributed laudable achievements in this field, but it is undeniable that with these exceptions apprenticeship training has not thrived in the rest of the Netherlands, and where it has blossomed, growth has been modest and the limited fruits have been meagre.' (de Groot, 1930; p. 18 f) ([49]).

In the 1920s, apprenticeship training was virtually limited to crafts and cottage industries. Dual training only became popular after World War II. It remained, however, subsidiary, as full time vocational schooling became available throughout the Netherlands. In the mid-1960s, formal integration of vocational and general education was instigated by a law unifying and governing secondary education, the *Mammoetwet* (Frommberger, 2001a *passim*). It was only in the mid-1980s that strong criticism of the bias in school-based vocational training surfaced. This eventually led to the objectives of the 1996 law on VET and adult education which defined and merged the curricula and organisation of school-based and in-company vocational training.

([48]) 'In the regions where there is no satisfactory trade training, we must do our utmost to encourage such sparse examples of apprentice training as we find.' (Authors' translation.)

([49]) Authors' translation.

Since then, Dutch young adults taking a non-academic form of VET can choose between a 'work-based route' and a 'school-based route'. Both variants adopted the same curricular criteria and the qualifications were equivalent in terms of their relevance to the labour market and the access right to Further Education (Frommberger, 2003).

6.2. Historical development of VET in Germany

Whenever and wherever there is talk of German VET, the so-called 'dual system' is always a prominent feature of the discussion. The 'system of simultaneous training in enterprises and vocational schools' (*Deutscher Ausschuss für das Erziehungs- und Bildungswesen 1964* [German committee for education and training]) is to this day the predominant path from school life to working life. Foreign observers of German VET are astonished that a substantial number of German companies and public institutions employ their own human resources and tangible assets to train apprentices. This high financial outlay does not confer an exclusive right to the trained worker, as the training enterprises and institutions are obliged by law to adhere to a nationwide curriculum. For this reason, instruction is not oriented to corporate or institutional knowledge and skills, but to groups of more generally applicable skills, the various combinations of which are recognised occupations, *Berufe*. At the end of this process a trainee has every chance of taking employment elsewhere and under better conditions.

Despite the value of the dual system for the transition of young people from compulsory schooling to working life, the almost exclusive concentration of outside observers on this system creates a distorted image of VET in Germany. The very term 'dual system' is misleading. It might suggest that the training in school and enterprise is of equivalent value in terms of time spent and training given, and not only that they take place simultaneously. Indeed, training in enterprises dominates, occupying between 70 and 75 % of training time (see also Kutscha, 1990; p. 289 et seq.; Deissinger, 1998; p. 81 et seq.).

Discussion of form and structure of training schemes for 16-20 year olds still overlooks the fact that training within the dual system may be the most important part of the system in quantitative terms, but it remains only part of the entirety. Expressed in numeric terms, in 1999, for example, there were in total some 3.3 million scholars and trainees between the ages of 16 and 20 (Gebbeken and Reinisch, 2001; p. 287 et seq.). Approximately 23 % of these attended a grammar school in the hope of qualifying for university admission. A further 6 % were in full-time education at advanced vocational schools ('vocational grammar schools', 'higher technical schools') so as to qualify for admission to a university of applied sciences. Around 30 % of 16-20 year olds thus chose the 'first' path, the academic route preparatory to higher education, in 1999. More than 50 % of young people in this age bracket took the 'second' path of a dual system traineeship, generally lasting three years, leading to a qualification as a journeyman in a craft, blue-collar worker in industry or skilled white-collar worker for business and administration.

In addition to the 'work-based route' within the dual system, there is a third path generally involving two-year full-time attendance in a vocational school. This pathway within the German system is largely unknown outside Germany, although in 1999 almost 21 % of the age group in question attended one of these secondary full-time vocational schools or *Berufsfachschulen*. It must be mentioned that not all of these schools offer recognised vocational qualifications; they are predominantly attended by pupils who failed to find a training place within the dual system. The number of places available in the dual system is still insufficient to offer everyone a requested place. There is, however, a whole range of vocational full-time schools which offer certificates not available elsewhere, i.e. not within the dual scheme. These typically include such predominantly female professions as nurse, kindergarten teacher, and laboratory assistant in the medical and chemical fields. These occupations have never been integrated into the dual system, so that for years there has been a narrow, but for young women significant, path to a skilled occupation via non-academic schooling (cf. also Feller, 1997).

It is particularly remarkable, and for foreign observers almost incredible, that pupils virtually repeat the whole of upper secondary education. Almost 20 % of those young people who, by dint of 12 or 13 years of school, had gained the right to university or polytechnic education, either initially or never take up such a place, but opt for a vocational training course within the dual system. The most popular programmes provide training in the commercial sector, banking and insurance, information technology and media communications, logistics and tourism.

Apprenticeship training, that is to say workplace training within the dual system, is therefore the most popular German pathway from school to job, and this view is shared by employer and trade unions alike. To understand this situation we must take the history of the dual system into account. The institutional, legal, economic and cultural foundations of these schools were laid in the last 20 years of the 19th and the first 20 years of the 20th century (Greinert, 1993; Stratmann and Schlösser, 1990), but apprentice training in the workplace draws upon an older tradition. The guilds of craftsmen and small merchants in almost all medieval towns developed this training system in the 14th and 15th centuries across Europe. The Guilds lost their enormous social and economic significance with the demise of feudalism and in the period of proto-industrialisation in the early 19th century (Deissinger, 1992; in this collection for the UK. For France: Schriewer, 1986; Oerter and Hörner, 1995. For the Netherlands: Frommberger, 2001b; Wolthuis, 2001).

The eclipse of the German guilds after the Napoleonic Wars was not permanent. Thanks to the *Handwerkerschutzgesetz* (Craft Trade Workers' Protection Act) of 26 July 1897, many features of traditional vocational training systems were revived (Greinert, 1993; p. 41). Chambers of handicrafts were founded as lobbies for interest groups of self-employed workers in these trades, as were *Innungen,* (guilds) with compulsory membership for all master craftsmen and journeymen in a jurisdiction. The chambers of handicrafts were assigned the essential role of passing regulations on apprenticeship training. Reconstituting trade craft bodies makes the classical model of apprenticeship to a master craftsman a paragon of

'German vocational training' (Abel, 1963, p. 42). This also indicates the enduring impact of such bodies on German vocational training.

The Craft Trade Workers' Protection Act may be considered a keystone of social and commercial policy-making evolution in the German empire and its predecessor. This policy trend established itself in the years after the Reich's foundation in 1870. Previously, that is to say since the deregulation of private enterprise and the abolition of mandatory guild membership in Prussia in 1811, the governments of the various German states showed little interest in VET for craftsmen, merchants and the growing number of industrial workers. They instead concentrated their financial and political activity on compulsory school education and the expansion of higher education. Universities and institutions of higher education for architecture and, later, for finance and commerce, were founded and financially supported to meet the increasing demand from public administration and enterprise for highly qualified specialists. Middle management schools for industry and business proliferated, largely thanks to private initiatives that were promoted and financially supported by the State (Grüner, 1967; Harney, 1980; Reinisch, 2001; Schiersmann, 1979).

Also, largely due to private initiatives, schools for apprentices were opened for instruction on Sundays and during the evening.

These schools were both 'repetition schools', since the material covered and supplemented the reading, writing and arithmetic of primary education, and purveyors of applied vocational training, teaching such subjects as technical drawing for the craft sector and double entry bookkeeping to trainees in administration. Known as 'further training schools' or 'Sunday schools', they were the predecessors of today's vocational schools attended by trainees during dual system training. The typical German form of vocational training in craft trades, now widely known as the dual system, came about with the Craft Trade Workers' Protection Act of 1897 and the almost simultaneous introduction of compulsory accompanying school attendance for craft trade apprentices.

There is no single reason why the German Empire, and its attendant politically and economically conservative circles, set store by the application of social and economic policies furthering the craft trades. Relevant historical research draws attention both to the economic and commercial motives for German improvement in economic competitiveness by means of improved worker training (Harney and Tenorth, 1986), and to the socio-political function of this measure. Both the craft trade leadership and, in particular, the future workers in craft trades were to be drawn into the conservative camp and thereby turned against the politicised and union-affiliated aspect of the industrial workforce bolstering the dominant social order (Greinert, 1975; Stratmann, 1992). In this sense, the traditional environment and conditions of working life were means of optimising the socialisation and political integration of the apprentice. The further training schools supported this process. Teachers at these schools were able to satisfy the professional interests of their pupils by teaching appropriate techniques, and to take occupation-related training as a stepping stone from which civics might be taught. This indoctrination was a significant departure from the curriculum of the 'further training

schools'. The repetition and elaboration of elementary teaching was replaced by occupational training and civics as course focuses. The combination of occupational and political instruction is still a central characteristic of the *Berufsschule* curriculum.

After the transition from the further training school to the vocational school and the legally guaranteed return to master-supervised apprenticeship at the beginning of the 20th century, there were two developments of significance to the VET configuration.

Even before the First World War, employers in the growing metal, electronic and chemical industries encountered the problem that, given the political monopoly of the craft trades, they could not meet demand by training their own workers. In this situation the association of industrial employers adapted the form of classical craft trade training and created industrial workplace training that shaped the new type of qualified personnel, the skilled worker, as a counterpart to the artisan journeyman. Like the journeyman, the skilled worker was to complete a training period, normally three years, and also to attend part-time vocational school with concluding examinations. This model was later adopted in other fields such as commerce, finance, insurance and transport, etc.

The basic characteristics of the dual system remained unchanged until 1969. Only the Vocational Education and Training Act of 1969 led to the limitation of autonomous regulation of training conditions among employer associations, chambers of handicrafts, and chambers of commerce and industry. This essentially legalised what was hitherto common practice. There was, however, one important exception: the unions were accorded equal executive powers in any matter involving the workers and VET. In line with this, bodies of employers and workers decide together with the responsible federal authority on creating new training occupations or changing existent ones. Here the focus is on curricular change. Currently 400 such training occupations exist. They are binding for both the trainee and the training establishment. A similar model is also applicable in vocational training schools. Due to the federal structure of Germany, however, the resulting curricula are not determined at a governmental level but, rather, by the constituent *Länder*.

This brief view of the dual system of vocational training in Germany indicates that there are many 'dualities' within the German VET system, and not all of them are between workplace-based and school-based training. A plethora of unsolved problems results from this pluralism. This, however, changes nothing in regard to the predominant position of workplace-based VET. The fact is accepted by businesses, government, political parties, unions and, last but not least, young people in Germany.

6.3. Conclusion

In conclusion, the following may be said about VET structures in the Netherlands and Germany ([50]).

Traditionally, the majority of young people opting for vocational training in the Netherlands do so within the framework of a full-time vocational training school. Theoretical and broad vocational knowledge is thus predominant, as is the continuing of general education in the occupation-oriented curriculum. Parallel to this system, the alternative form of VET in the workplace accompanied by vocational training school attendance has established itself in some regions. Occupation-specific education of the younger generation in the form of 'post-compulsory education' was given primarily in schools as a State responsibility to shelter young people from the working world for as long as possible.

In Germany the majority of young people taking VET do so within the dual VET system. The work place is thus the mainstay of vocational learning. The responsibility for VET is primarily determined by employers and, ultimately, by the social partners. Full-time school vocational training only dominates isolated branches. In these cases it is considered a subsidiary solution.

The historical and comparative perspective raises three questions.

Why did occupational and in-company training establish itself as the training form in Germany beyond the realm of artisanry to include the technical and commercial fields? Why did the Dutch form of standardised workplace training for all businesses not become universal? And why did full-time school-based VET not attain a dominant role in Germany as it did in the Netherlands and most other European countries?

The development of the various VET systems offers some tentative answers to these crucial questions. There is, however, a lack of solid historical research dedicated to systematic investigation and comparison of various single aspects of the problem, and there is still a paucity of relevant source analysis pertaining to workplace training strategies for the Netherlands and for other European countries.

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([50]) It is reiterated that the following conclusions are extremely brief. For more detailed discussion, cf. Frommberger (1999).

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7. The dynamics of vocational training innovation in Switzerland

Philipp Gonon

Switzerland tends to be left on the sidelines in the international debate on educational reform and rarely receives a mention in comparative international studies carried out in vocational training research. Only one British study, that by Bierhoff and Prais (1997) attempted to compare some work-related aspects of primary school teaching and vocational training in Switzerland with those in UK, although even they tended to focus on the situation in Canton Zürich. A more recent study of German-speaking countries by Rothe (2001) makes some comparisons between Switzerland, Austria and Germany but his analysis is not entirely systematic. Yet the surprising scope of reform undertaken in Switzerland over the past few years would justify taking a closer look at the situation there and the dynamic pace of reform compared with other countries. This article hopes to make a start on this.

7.1. Vocational training as a system

There are a number of reasons why so few comparative international studies take Switzerland into account. One is the fact that, traditionally, little attention has been devoted to vocational training policy in Switzerland itself; another is that its presentation to the public abroad has been little more than rudimentary. Vocational training research, too, has been largely neglected and has only recently gathered impetus.

The picture presented by Swiss education and training is complex and constantly changing. Understanding it calls for considerable knowledge and expertise, particularly if one wishes to gain an overall view of more than one area covering all parts of the country.

Switzerland tends frequently, and over-hastily, to be classified as having adopted the German vocational training model, with no regard for the western (French-speaking) and Italian-speaking parts of the country. As a result, use is often made of the term ‘dual system’, which in Switzerland itself is used mainly when different types of learning environments – school and firm – are combined in a vocational training system. At first glance this might seem to hold few problems but closer scrutiny demands clarification. Whereas, historically, vocational schools were intended as a means of supplementing the training provided by employers, they gradually increased in status. The 1870s saw the concept of plurality of training environments gaining ground in order to put greater emphasis on the value of work-based training (Gonon, 2002b).

Greinert especially sees a system of vocational training not just as linking different learning environments but as a somewhat more complex construct. He distinguishes between

Germany's dual system of vocational training and bureaucratic, state-run systems or purely market-oriented training models. He qualifies vocational training in German-speaking countries as a 'state-controlled market model' (Greinert, 1993). His description of the development in the case of the Federal Republic of Germany also holds good in general terms for Switzerland.

'The dual system [...] is not the outcome of conscious planning and development but has come into being as an integral whole by a complex historical process. For a long time on-the-job training and the instruction provided by the vocational schools evolved more or less independently of one another, only becoming intentionally linked to form a systematic route to a qualification – the dual system – at a very late date' (Greinert, 1993, p. 19).

Swiss vocational training is similarly not the result of a forward-looking initiative and planning process; it only came into being in the course of the 1930s when attendance at a vocational school was made compulsory for all apprentices (Tabin, 1989).

Moreover, apprenticeship training in Switzerland does not only cover areas where qualifications pose difficulties. What Greinert (1999) refers to as the 'traditional corporatist' model of German-speaking countries, that puts emphasis on the occupation, is also significant in its social and innovation policy dimension.

The concept of system was born out of a historical, political and reform-driven debate. However, the relatively loose connection between vocational school and work-based training and the lack of coordination and cooperation with the rest of the education system has resulted in its nature as a system being denied by some involved in vocational and industrial training; the use of the term 'dual system' is regarded as confusing. Instead some, such as Deissinger, regard a person's occupation as structurally and functionally the decisive 'hard core'. He sees this and what he refers to as *Beruflichkeit*, which might be translated as the 'occupational essence', as the organising principle – and not the system – in German vocational training. A category 'occupation' which has come into being, as he says, as a function of typically national historical factors and a cultural shaping of the relationships between training and employment has ensured that a specific design of framework of economic policy and organisation corresponds with a curricular shaping of vocational qualification (Deissinger, 1998; p. 254).

Occupation and/or the duality of learning environments and typically national modes of control come up against their limits when a country allows different forms of vocational training to coexist. This is exactly what has happened in the case of Switzerland.

7.1.1. Vocational training as a subsystem of education

A different approach is to consider vocational training as a subsystem of social education contributing to the differences coexisting within the education system. We can refer to vocational training as a system insofar as it exists as an independent functional system

alongside others and – to use the terminology of systems theory – relies on operational linkage and structural coupling. Vocational training also offers 'typical patterns of modern society with its functional differences' (Luhmann, 2002; p. 116).

Vocational training seeks to create a sound basis for a subsequent career (idem, p. 719) in a specific sector of the employment system. It is a phase of a person's life with a lasting socialising and educating effect renewable in the course of continuing training and adult education (idem, p. 101). From the 'occupational point of view' certain abilities, skills and attitudes are delivered and working and intermediate levels coupled (Harney, 1990; p. 226).

Work and occupation were incorporated into the education system as relevant points of reference at the beginning of the 20th century and led to a new concept that Schorr calls 'general education taking account of the economic system' (Schorr, 1996; p. 154) referring to the fact that building on occupational skills guarantees the ability to learn. On the basis of knowledge (and skills) the individual achieves other ways and means of directing the course of his future career (Luhmann, 2002; p. 97) and hence of extending his radius of action (idem, p. 100).

The economic system is relevant here in that the question of appropriate work following training, thus an employment system, is of central importance. It is the 'discrepancy between long-term career planning and short-term fluctuations in the economy and its incalculability' that gives rise to the paradox of two conflicting principles between which the education system and its vocational training subsystem oscillate, namely specialisation and generalisation. Because of this conflict, the education system is ripe for reform in any historical situation (idem, p. 125 et seq.). Moreover, it can react to unpredictability by the very fact of this self-generated uncertainty.

Defining vocational training as a subsystem of the education system has the advantage that we are not obliged immediately to differentiate between its widely diverging, regional, cantonal and international features. Switzerland, in particular, has a number of hybrid forms extending beyond linguistic frontiers, such as the institutionalised arrangement of school education in combination with work-based training, with a view to providing access to higher education, vocational or otherwise, as well as to employment.

The fact of its incorporation within the education system, plus its versatility in the sense of leading to a qualification and providing access to both employment and higher education, shows the Swiss vocational training system to be surprisingly dynamic.

7.2. Educational reform through improvement

Like most education systems, the Swiss system requires stability and continuity. Generally speaking, a cautious attitude is adopted as regards innovation, so that far-reaching changes have little hope of realisation. During the 1960s the advocates of comprehensive schools and

those wishing to increase the proportion of pupils obtaining the *Matura* equivalent of the German *Abitur* found progress hard. Plans announced for reform, therefore, tend not to have the aim of radically changing the status quo but of improving on it (Gonon, 2002b; p. 321 et seq.). To date Switzerland stands out as the European country with the lowest proportion of students going on to university in any academic year and one of the highest proportions of young adults achieving a vocational (skilled worker) qualification. Upper secondary education is consequently divided into two streams, a vocationally oriented one attracting most pupils and a general education stream which, though expanding, is levelling off in the region of 20 % of the total figure. Until just on 10 years ago general and vocational education were separate and this basic architecture, whose rigid separation probably makes it unique in Europe, has even today been little challenged. Only when the vocational *Matura* qualification was created in 1993 was a stronger link forged between vocational training and general education committed to an academic curriculum (Kiener and Gonon, 1998).

7.2.1. Federalism and particularity as drivers for reform

Switzerland is one of the few countries that does not have a national ministry of education. Efforts in this direction during the 19th century failed and all matters connected with education are one of the main responsibilities of cantonal government. The sole exception is vocational training, which for historical reasons is firmly linked to the running of the national economy. Education in Switzerland, therefore, has marked regional or cantonal features and one often hears references to the country's 26 education systems, in line with the number of its cantons. Vocational training, however, is governed by national legislation. Because of the disparities still existing in vocational training, the 1978 law on vocational training in force until a short time ago was a framework law that allowed considerable scope for ministerial orders, implementing regulations and cantonal provisions. In the German-speaking part of Switzerland the dual system – or in fact the triad system if one considers the three learning environments of workplace, vocational school and training centre serving a number of firms – has become firmly established. However, the predominant vocational training model in the French- and Italian-speaking parts of the country is the technical college, offering a combination of technical and general subjects (Wettstein, 1994). The new law on vocational training, which came into force in 2003, essentially holds to this arrangement. The same cantonal features and characteristics, varying with the branch of industry or region concerned, are also to be found in adult and further education. It is in this area of tension between federalism and the need for nationally uniform structures to provide a common basis for communication and mobility that Swiss education policy is situated. Arriving at a consensus by the typically Swiss procedure of *Vernehmlassung*, whereby all interested parties are informed of the content of draft legislation and given the opportunity to make comments and proposals before it comes before parliament, is an important element in national education policy. A variety of models and solutions make it possible to view varying cantonal features as experiments being conducted in a sort of large laboratory as a basis for decisions on further innovation. That, at least, was how Switzerland's first major comparative educationalist,

Marc Antoine Julien de Paris, saw the situation as far as the cantons were concerned (Gonon, 1998).

7.3. Early vocational training in Switzerland

In the 19th century, factories did not provide training for skilled or semi-skilled occupations. When the upsurge in industrial activity and free trade resulted in plummeting volume sales due to a lack of competitiveness, firms took a long time to realise that they needed to enhance the quality of their products to withstand foreign competition, partly by improving the skills of their workforces through their training provision.

The road to the reform of vocational training was long and arduous. In the late 1820s the *Schweizer Gemeinnützige Gesellschaft* (SGG) – a public benefit organisation – was already discussing social and political participation and integration and further training in what were known as further training schools. Business and industry and local trade associations and the then *Schweizerischer Gewerbeverein* or Swiss Association of Trades that existed between 1849 and 1864 all came down firmly in favour of protectionism. Only after 1870 did business and industry become more open to training reform, mainly at the instigation of the *Schweizerischer Gewerbeverband* (Swiss Trade Association) that was founded in 1879. The concept of apprenticeship that still largely influences vocational training today became established in the 1880s. Like primary schooling, it was influenced by the introduction of a recruitment examination for teachers in 1875 and also took over some elements of the examination material. On-the-job apprenticeship training was to be supplemented in the further training schools – later known as vocational schools – by the teaching of civics and the revision and development of subjects taught at primary school. Specialist subjects, particularly drawing and occupational subject-matters, were also to be included in the curriculum. The decision of the federal parliament in 1884 to subsidise vocational training establishments laid the foundations for vocational training. In addition to the government-run training workshops and full-time schools, it opened the way for the development of the dual training system based on two training environments, the firm and the vocational school.

Industrial organisations and political parties unanimously demanded State intervention to preserve the traditional apprenticeship served under a master and to modernise education following compulsory primary education. They called for assistance for further training schools and for new institutions such as specialist training schools and training workshops to be set up. These, unlike the training given by a master, would provide basic vocational training in the classroom. The list of demands also included assistance for craft trade museums, regulation of vocational training at national level, and supervision of teaching.

Not until 1930 was federal legislation passed requiring a valid apprenticeship agreement for industrial, craft and commercial occupations and making a formal qualification dependent on vocational school attendance. Other legislation regulating vocational training for industrial and craft trades was introduced in 1963 and 1978. The amendments made were designed to

underpin and expand vocational training while retaining its existing variety. The dual training model predominant in German-speaking Switzerland owes its existence to the efforts of a number of bodies ranging from occupational organisations and the government to schools, manufacturing firms, parents and apprentices. It proved so successful that it continued to exist – with modifications and with an increasing amount of classroom instruction – well into the age of large-scale industry and services.

7.3.1. The third learning environment: the synthesis of learning and work

We shall look in more detail at one innovative concept and its current dynamic. This is just one of the elements that help to ensure that vocational training continues to be modified, diversified and pluralised through the involvement of several protagonists.

The new Swiss law on vocational training expressly refers to the third learning environment as a means of combining the advantages of on-the-job training and classroom learning. Hitherto, so-called 'third' learning environments offered introductory courses for young people beginning their vocational training. The importance of these is now recognised in the 2003 law (*nBBG*, 2003), which provides for them to be used for other types of training as well.

School and workplace can be regarded as radical alternative learning environments. Should people learn at the actual workplace? Or should they learn everything they need to know at school? Previous discussion centred on whether to transform school as an institution, to put it at the service of the world of work as against transforming the workplace into a place of instruction. Both concepts can be used empathetically or be read as criticism. It was the repeated movement between school and workplace that ultimately led to realisation of the potential of a third learning environment.

7.3.2. Working at school: Pestalozzi, Fellenberg and others

It was during the age of enlightenment that Campe, the German educator and author of children's books, wrote a pamphlet entitled *Concerning a number of disregarded or unused means for promoting industry, the population and public prosperity*, in which he proposed that every schoolhouse should have two rooms allocated for instruction (Campe, 1786; p. 10). In so doing he was repeating the demands of other educators of the period. One room was to be devoted to teaching while, in the other, a person with the appropriate skills would teach 'all kinds of handwork – knitting, sewing, spinning, etc.' The children would switch from one room to the other. This would put an end to idleness and at the same time direct pupils' inherent urge to be active into useful channels. Those desirous of forming industrious people should set up workshops in schools, thereby contributing to people's development and stimulating activity in crafts, arts and science (idem, p. 17). Campe, however, was not mainly concerned with the qualifying skills that could be acquired while working with machines and in farming. He simply believed that the character of industrious people, indeed of a whole

nation, could be reshaped by teaching sensible, clever, skilful, hardworking and honest people how to work.

Like many other educators of his time Campe was an advocate of industrial schools. The word 'industry' as used here should not be understood only in its modern sense but as having a meaning close to that of the Latin *industria*, that of diligence and determination.

The educator of the period best known today, Pestalozzi, was another advocate of such industriousness in his early writings (Pestalozzi, 1927). In his novel *Lienhard und Gertrud*, written for 'the people', the children are described as knitting, sewing and spinning cotton. Instructed by their mother they work as they do at home for the sake of morality. '*Freude bey der Arbeit, Munterkeit im Genuss der Bedürfnisse und in der Erfüllung der Pflichten des Lebens*' (Joy in work, a cheerful enjoyment of needs and fulfilment of life's duties) and '*Gewinnst der Gewerbsamkeit*' (gain from industriousness) are the consequence (loc. cit., Vol. 5, p. 151). Education in Pestalozzi's view should impart more than mere knowledge. In this he knew himself to be in agreement with Fellenberg, who on his school estate of Hofwyl, used work as a means of inculcating a moral sense as well as providing training in agriculture, man's first form of work (Guggisberg, 1953).

According to this view, individual happiness is bound up with usefulness to society. Its advocates regarded educating young people to be industrious as important both for work and society. Inventiveness and being accustomed to farm work were fused conceptually together.

In all these schemes and transpositions it was life in the family home, the farming household, that, by complementing or replacing traditional school instruction, helped to equip pupils with useful knowhow while nurturing the virtues of enterprise and a constant willingness to innovate for the good of the community as a whole.

School had to become more like farming, domestic economy, the craft trades or work in industry that was then emerging. At least according to leading educationalists at the beginning of the 19th century, it needed to become a place of work. This way of thinking persisted into the 20th century, when it was defended by so internationally respected a personality as Kerschensteiner (Gonon, 2002a). The converse view – that the workplace should be made a place of education – underlay the reforming efforts of some educationalists and politicians towards the end of the 19th century.

7.3.3. The workplace as school: Schäppi, Bendel, etc.

As early as 1845, Zschokke, in a novel entitled *Meister Jordan oder das Handwerk hat goldenen Boden* (Master Jordan or craft work has a golden base) described how, instead of despising school instruction, perceptive craftsmen sought to build on it in order to work intelligently (Zschokke, 1893).

As he saw it, it was not school reform or reorganisation of the education system that was needed when new ways of training people for work were being considered, but raising the status of the craft trades. Towards the end of the 19th century, therefore, interest in Switzerland became focused on apprenticeship training. According to the Winterthur teacher Hug, writing in 1881, those wishing to improve the economic situation of the craft trades and small-scale industry also needed to keep an eye on what he termed 'the social question'. But raising the educational level would not be achieved solely through teaching in primary schools. The training firms gave to apprentices was also in need of reform, as were the further training schools that had already been set up on the basis of local initiatives. Also needed, however, were specialist craft-related courses at suitable institutions, specialised vocational schools, craft museums and training workshops (Hug, 1881; p. 23 et seq.).

In training workshops 'methodical working, versatility and continuing instruction' could be used to avoid the shortcomings of masters' workshops (idem, p. 31). Hug referred to the reports of the economist Karl Bücher in his 1878 publication *Die Lehrlingswesen und die gewerbliche Bildung in Frankreich* (Apprenticeship and craft training in France). Since Hug considered well organised training workshops as the ideal for craft apprenticeships (p. 31 et seq.) but felt their general introduction to be impractical, he emphasised the need to revise workshop instruction. Since there was little room for state intervention, it was up to the guilds to ensure that their members voluntarily attended courses enabling them to become well-trained masters.

Boos argued along similar lines, although he placed more stress on reforming apprenticeship training in firms through the introduction of examinations to be validated by a central chamber of trade and commerce and through appropriate legislation (Boos, 1881; p. 46 et seq.). Examinations at the end of a period of apprenticeship and the award of prizes for work produced by apprentices would act as incentives to firms to systematise their training. The apprenticeship examinations should not, as previously, consist entirely of producing a piece of work to qualify as a journeyman; instead they should involve specific questions to ascertain a candidate's knowledge of the craft or trade as well as the most important aspects of what was taught at the further training schools (p. 49). General knowledge and drawing should, moreover, be taught during the daytime and not in the evening when workers were tired.

Those critical of the situation in the crafts and trades at the time wanted more emphasis on training young recruits. The traditional master/apprentice relationship was no longer considered so effective in terms of the instruction provided. The craftsmen themselves were lacking in teaching skills, and in some cases even in craft skills, while mechanisation and division of labour militated against systematic instruction. At the same time, severe competitive pressure was being exerted by large industrial firms at home and abroad, leaving little time for people to master a trade thoroughly. Schäppi was among those who realised that the strict but beneficial discipline that had existed among members of a guild was gone never to return. And even the apprentice's life as a member of the master's family, which did much to enhance his training, had become a rare exception.

‘Nowadays a master endeavours to shape the apprentice into a useful worker as quickly as possible. The relationship between the two is rather loose, it is a relationship of a paid worker to his employer and no longer one of training’ (Schäppi, 1882; p. 7).

In a thorough analysis published in 1883, Bendel, the director of the Industry and Crafts Museum in St Gallen, stated his opinion that, in future, training in industry and the craft trades would have to be carried out largely by firms, but also in schools and museums in order to ensure its currency. Isolated reforms offered too little prospect of success. What was needed was a concerted effort by all concerned and particularly financial assistance from federal government (Bendel, 1883; p. 76). He also listed a series of measures that would serve to underpin on-the-job training.

7.3.4. Pluralisation of vocational training

In this brief historical account we have tried to show the motives underlying the ‘third learning environment’.

Campe, Pestalozzi and others wanted to reform school education because it was too far removed from the needs of the economy and out of reach of poor people. Industriousness, therefore, was a political and economic reform project of the age of enlightenment to be carried out in schools. Zschokke, Schäppi and Bendel in their turn criticised the outdated instruction being provided by firms and the limitations on trade and craft production methods imposed by the guilds. They wanted more legislation and training to remedy the situation at the end of the 19th century and ensure competitiveness by helping apprentices acquire practical skills and general knowledge.

The tasks of the third learning environment emerge from all this as follows.

It was a project for reform aimed at bridging the gap between informal learning, mainly on the job, and formal school learning. The third learning environment can thus be defined negatively on the basis of the shortcomings of school and industry. In positive terms it seeks to combine the advantages of learning on the job with those of systematic instruction. This has organisational, curricular and didactic aspects. Organisationally the third learning environment bears similarities with a school or sheltered area away from day-to-day production work; it may be a training workshop. In curricular terms work-related knowledge and skills are systematically organised and conveyed in theoretical and practical stages. Methodologically the emphasis is on practical, work-related instruction and learning that leaves sufficient room for trial and experiment. The tasks of the third learning environment can be defined as introducing trainees to work of a certain complexity away from the actual production location. This permits greater tolerance of errors which can then be usefully reflected on (Dewey, 1997).

Introductory courses for those starting out on their apprenticeship remain an important aspect of the third learning environment, which also provides an opportunity to go more deeply into a subject or to order know-how already acquired in a work context and to put theoretical knowledge into practice. Work towards qualification can progress more carefully and systematically. Experience gained on the job should be consolidated by repetition and reflection in a sheltered environment. Finally, the third learning environment can take on tasks in continuing and further training, retraining and subsequent qualification. The most promising opportunities of a third learning environment lie in the awareness of acquiring a learning culture.

7.4. Conclusion

Vocational training remains heavily influenced by the type of occupation concerned. This holds good even though the new law on vocational training talks less about occupation and more about work organisation (instead of occupational organisations) and about educational ordinances rather than training regulations. The term 'dual system' only partly takes account of vocational training as it is today in that several learning environments and agents are now involved and Switzerland in its administrative variety boasts a plurality of forms of vocational training and training environments, institutions and links between them. The education system with vocational training is embedded in a political system of small-scale, cooperative federalism.

It is these characteristics that permit wide-ranging experimentation in educational innovation to exist with plurality of work- and classroom-based forms of learning and their combinations, heavily influenced by regional and cantonal tradition. Probably the most interesting trend is the growing incorporation of vocational training into the state education system which, since the 1990s, has been lent impetus by the creation of a vocational *Matura* qualification and the involvement of different agents from the general education and vocational training spheres. This development provides access to higher education as vocational training is now directed more towards general and more cantonally influenced education policy. As a result, since the 1990s cantonal vocational training offices have been increasingly taken out of the realm of economics departments and brought under the education authorities.

Switzerland's surprisingly high level of experimentation and innovation in vocational training in recent years is largely due to greater openness to developments abroad and the state education system. The call to make vocational training more attractive and flexible and for greater transparency of structures and forms of learning has altered Swiss vocational training. The price of greater attractiveness has been the sacrifice of some of its typical characteristics.

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8. Can European policy draw on models of vocational education?

Anja Heikkinen

8.1. The influence of the history of vocational education and training on policy

Studies of the transformation of vocational education and training (VET) in Europe focus on systems, even when they are based on sector-specific, often technical, perspectives ([51]). VET is seldom considered as an internally complex field composed of different sectors or as an outcome of wider educational, political and social programmes. Greinert (1993) has presented probably the most elaborated and utilised typology of VET systems, in his description of a market or liberalist model (UK, US), a bureaucractic or school model (France, Italy, Scandinavia), a dual model (Austria, Germany, Switzerland). Deissinger (1995) has tried to improve the paradigm by introducing, against the output factors of the VET system, input factors called qualification styles with their three structural and functional dimensions:

(a) political and organisational regulation frameworks for vocational training ([52]) processes (*ordnungspolitisch-organitorische Rahmen des Qualifizierungsprozesses*);

(b) didactic-curricular orientation of vocational training processes (*didaktisch-curriculare Ausrichtung des Qualifizierungsprozesses*);

(c) the place of the vocational training process in the context of socialisation (*Verortung des Qualifizierungsprozesses im Sozialisationszusammenhang*).

As an example of qualification styles, Deissinger charaterises Germany, which represents:

(a) cooperation of State and industry in giving competing regulations;

([51]) One aim of this chapter is to question universalising interpretations of occupational work and vocational education. Even if there is little space to go deeper, one could notice that in the Finnish discussion, vocational education has come to have much wider meaning – including all branches of industry, most levels of occupational hierarchies, etc. – than in other countries in Europe. The concept of VET school or school-based VET has referred to all occupational fields, although recently the terminology has shifted towards the dominating European VET discourse (Heikkinen, 1995; Heikkinen et al., 1999, Heikkinen and Kuusisto 2000, Heikkinen and Henriksson 2002).

([52]) Deissinger's concept of 'qualification', based on Beck, means knowledge, abilities and attitudes of a person in relation to demands of a (certain) work-place. It 'describes how far the capacities of an individual facilitates/enables them to meet or fulfil the necessary functions' (of an occupation).

(b) aims and contents of training oriented towards complex qualification profiles (occupational principle, *Berufsprinzip*);

(c) pedagogical relevance of socialisation in VET, which mediates between general schooling and employment and establishing a learning environment separate both from school and employment.

Researchers in different national cultural contexts have been strongly influenced by German interpretations. Even if Greinert (1999) has renamed his models into classical systems of vocational education, the value of these typologies as theoretical constructions is overshadowed by the tendency to apply them as models for interpreting realities ([53]), when countries are compared.

The model approach tends to use history in an a-historical way by taking certain moments of the historical process as unquestionable starting points for comparison. The aim of this chapter is to show the need for a historicising approach in cross-cultural discussions on VET – i.e. questioning the emergence and transformation of meanings and functions that it may have. In starting this it may be important to study times when VET was confronted with other forms of education. Debates on the nature, length and universality of compulsory or primary education and on reintegration of people into employment and education, related to transformations in economy and society, repeatedly provide a revealing platform for discussions about the distinctiveness of different forms of education. In this context, continuing education (*jatko-opetus*, *Fortbildung*, *fortsättningsskola*, *fortsettelse/framhaldsutdanning*) refers to institutional solutions and pedagogical definitions about education and training related to people's entrance (typically from initial/compulsory education) into employment and society. Even if nowadays it is considered as age-bound student flows or pathways through education, pedagogically continuing education has been concerned with participation in social, political and occupational life.

By recognising and making visible certain entities, phenomena, changes and continuities as being relevant in vocational education, researchers help to define work and education at subnational, national and supranational levels. Traditionally, history and education have been the national(ist) disciplines, promoting building of nation-States, national cultures and industries. In the making of the European economic, educational and research area, they may continue as promoters of programmes of building Europe of a certain kind. The following sections discussing continuing education in Finland, Nordic countries and Germany, primarily since the late 19th century, do not aim at presenting (correct) pictures of the development of VET. With the lack of cross-cultural research, they remain reflections on a few culturally typical characterisations of VET from a restricted Finnish point of view.

([53]) Miller argues in his analyses of the culture of virtualism, that there is no demand for abstractions and models of reality in order to understand and shape it. On the contrary, there is a market for abstractions, which replace rather than model the phenomena they purport to represent. Research and researchers increasingly adopt a consultative approach in legitimisation of managerial governance, which has the power to modify reality according to the abstractions, by which politicians wish to interpret it (Miller, 2002).

8.2. Continuing education in Finland

Finnish research on continuing education has been overshadowed by the interest in transformation of the binary system of 'folk school' and gymnasium into a unified system of comprehensive education. Studying the latter together with VET would open up new insights into the complex functions of education in general. While the popular-democratic conceptions of Finnish vocational education are widely ignored, the focus here is on relations between 'folk education' and vocational education, although they both increasingly had to compromise with academic education.

The development of Finnish VET had a kick start after the wars between France, Russia and Sweden-Finland, when Finland became an autonomous grand duchy of the Russian empire in 1809. For decades, society was reorganising and developing basic structures of economy, education and governance. The first efforts in a large country with few factories and schools, with a mostly self-sustaining, poor rural population, were holistic programmes (Heikkinen, 1995; 2000a; Heikkinen et al.,1999). For a long time, the same networks were responsible for all initiatives in the developing industries and education. The focus of emerging VET was on more efficient and rational farming and healthy living and on the creation of industrially enlightened civil servants and leaders for the country. It was indicative of the connection between State and industry that the first schools for crafts and industry (1842 Act on training craftsmen and manufacturers and the 1847 Act on technical real-schools) were established by the Board of Manufacture, one of the first national boards with the explicit task of promoting vocational education. The Act was based on initiatives from the crafts sector and the schools had a clear vocational mission.

Organising 'folk education' remained the duty of the Lutheran church, homes and municipalities until the 1860s. The differences between rural communities and towns were large until the gradual liberation of trade and industry from the 1860s. However, the first non-religious inspectors of 'folk schools' were appointed in 1861 and the independent Board of Schools Affairs (which means Education) was established in 1869. The national decree on 'folk schools' in 1866 was an outcome of a wider Fennoman([54]) programme on 'folk enlightenment', which was motivated by economical and practical aims, especially concerning the rural population.

The debate on relations between VET, 'folk education' and continuing education increased significantly during the 1880s. Despite the politicised nature of the Finnish popular-democratic enlightenment – connected to the language struggle between Swedish and Finnish – it was more pragmatic and vocationally oriented than in other Nordic countries. The activation of the Fennoman movement motivated some bigger towns to start more systematic teaching of general subjects, home economics and handicraft in continuing classes. The 1879

([54]) The Fennomans were the most important political movement in the 19th century Grand Duchy of Finland. After the Crimean War, they founded the Finnish Party and intensified the language conflict attempting to raise the Finnish language and Finnish culture from peasant-status to the position of a national language and a national culture.

Act on liberation of trade obliged employers to release employees under 15 to attend school in the evenings. Depending on the region, this could mean either continuing classes in the 'folk school' or the school for crafts and industry. Education was considered to have two different aims (*Teollisuushallituksen*, 1888). First, it was to provide all children with general education and education for citizenship, which was also the prerequisite for vocational training, and this is what the decree on continuing classes meant. Second, the Trade Act referred to school-based vocational education, which aimed at providing occupational knowledge and support for learning at work. Some civil servants and crafts associations suggested obligatory attendance at schools for crafts and industry until the age of 21, but with little consequence. The few crafts had little influence, and industrial workers none, in the industrial Finland project, whose main focus was in developing Finnish engineers (later foremen and skilled workers) through full-time VET.

While the emerging VET institutions in the late 19th century increasingly integrated the promotion of different areas of industry to the agricultural/farmers, industrial and welfare Finland projects, the paradigms of VET started to diverge accordingly. All parties had their headquarters in the expanding national governance. One of the main proponents of continuing education from the 1890s until the 1920s was Mikael Soininen (Johnsson, 1906), head of the Teacher Seminar, inspector and head of the Board of Education ([55]). His prime concern was education for the nation and from this perspective he considered all forms of education. In his article, written after the reform of general election rights 1905, he summarises his educational programme.

'On reaching adulthood, every young man and woman has to vote about the fate of the country […] Where is s/he going to get all the knowledge and maturity for judgement, which is required? Where is s/he going to get comprehension from the structure and needs of the society, in order to become able as its legislator and governor? […] These are the real challenges for the survival of our nation. The most natural response to them should be the expansion of popular education in such a way, that it can provide guidance needed in these matters […] Social science, which is so important for our nation during these times, must be taught after the 'folk school'. For that reason we need some kind of continuing education after initial school years. But this is not the only reason, why continuing education is needed […] Technical drawing and other preparatory instruction for different industries has become quite usual for urban youngsters in all countries; the rural population needs general instruction in the basics of rational, up-to-date agriculture; future farmers' wives should have education in the affairs of the household; everybody should know the basics of general health-care, including many special areas, which are deeply related to the physical and ethical livelihood of the nation' (Johnsson, 1906).

Between the 1880s and the 1910s, the promotion of the Finnish economy and industries and provision of education happened parallel to Finland projects. The consensual defence against

([55]) Mikael Soininen (Johnsson, 1906) belonged to the progressive Young Fennomans and was active in promoting the Finnish cooperative movement and developing the 'folk school' into a 'school for life'.

pressure from Russification was channelled through shared efforts to develop national industries and education. Along with new branch departments and boards, a great number of schools, institutes and advisers in all branches of industry were established. The proponents of distinctive VET, especially in the Ministry of Trade and Industry, and developers of 'folk school' and continuing school in the Ministry of Education, managed for some time to collaborate in planning national reforms for post-compulsory education. Jalmari Kekkonen, the pioneer and inspector of VET in crafts and industry (1908-32), suggested that Continuing school could serve as preparation for apprenticeship schools, replacing evening or part-time schools and followers of the schools for crafts and industry, which in towns had been substituted by full-time vocational schools for boys and girls since 1899. The inadequate apprenticeship schools could thus be improved into real vocational schools instead of being substitutes for continuing school. The mission of vocational schools was to promote the development of occupations; they had to be practical and authentic workplaces, but dominated by pedagogy (*Teollisuushallituksen*, 1923; Heikkinen, 1995).

However, tensions between the Finland projects were activated after the Russian revolution, the establishment of the independent nation-State and civil war. Consensual reform plans from the turn of the century were implemented in the 1920s in a completely new political and economic situation. The contrasts between urban and rural areas, life forms and industries, became visible, the popular movements started to split into communist, social democratic and agrarian parties and the confrontations between workers and employers moved to the national level. Also the act on universal obligation to attend 'folk school' was prolonged till 1921 ([56]). The act stated the obligation to attend ('folk') continuing school for two years after compulsory schooling, if the young person did not continue her/his studies in some other school. It was crucial whether vocational schools could be considered as other schools. Once the 'folk school' had become established and the political and labour market associations were established beside the popular-democratic movements, the divisions between citizenship education, academic education and vocational education became institutionalised. Advocates of the comprehensive continuing school, conceiving themselves as the followers of the Fennoman programme of universal citizenship, defended it as a general, practical school for the majority of the age group (except grammar school students) and as education for citizenship. Many proponents of farmers Finland saw continuing school also as an alternative to initial VET in rural communities, because of the difficulties in providing full-time vocational schools for peasantry. The opponents, the proponents of VET for crafts and industry, defended the distinctiveness of vocational education against education for citizenship and academic education and emphasised its vital link to industry. In urban municipalities, VET schools were favoured as substitutes for continuing schools until the 1940s.

([56]) However, the preparatory schools in towns and first classes of gymnasium, i.e. middle school, maintained their status as substitutes, until the 1950s and the 1970s, respectively.

Between the 1920s and the 1940s there were repeated initiatives from the Ministry and Board of Education and Teacher Seminars about developing continuing school into practically oriented general vocational school, which would substitute the former institutes of lower VET (Salo, 1944). They partly connected to a wider political cleansing and domestication of administration, increasing the power of rural and popular parties and associations, which at that time were holding positions in the Ministries of Education and Agriculture and had close links to the 'folk education' movement (Heikkinen et al., 1999). The proponents of women's VET – beside crafts and industry, also in rural industries (agriculture, animal husbandry, household economy) – strongly protested against suggestions of transferring only female branches of VET into continuing school and under the governance of Board of Education. However, there were controversies among proponents of continuing school as well, personified in 'folk school' inspector Alfred Salmela, its most aggressive advocate between 1926 and 1964. In his programme of patriotic, universal 'folk education', the aim of continuing school was, in the first place, to guarantee education for citizenship, then to give occupational guidance and finally to provide practical and occupationally oriented education. Salmela only accepted the gymnasium as an alternative for intellectually talented children (Kailanpää, 1962).

His programme was seemingly successful. Continuing school became obligatory for applicants for other schools in 1943 and in the 1958 reform it was renamed into School for Citizenship (Kailanpää, 1962). The period between the 1930s and 1945 was the peak for continuing school, especially in rural areas, where the enrolment rate could be 140 % compared to the age group ([57]). The victory was short (Jauhiainen, 2002): the popularity of gymnasium and middle school exploded and vocational education had taken off and gained national recognition in modernising Finnish VET. Reform of comprehensive schools and the system of school-based VET, also integrated to the welfare Finland project, were just about to be implemented.

8.3. Continuing education in Nordic countries and Germany

In order to show the potential of reflections on continuing education for cross-cultural research on VET, this section makes a few comments about developments in Germany and other Nordic countries. The attempt is biased, since there is copious literature on the topic in Germany, compared to marginal interest among Nordic researchers. In Germany, the debate of continuing education (*Fortbildungsschule*) ended into its transformation into vocational school (*Berufsschule*). In contrast, in no Nordic country did the initiatives and discussions, even if different from each other, lead to this solution.

([57]) The enrolment rate is an indicator of the meaning of continuing education as a promoter of political, economic and social participation. VET schools, continuing schools and 'folk high schools' were recruiting different age cohorts, also adults, until universal education system started to take effect. Paradoxically, despite educational reform and raising educational expectations, the quota of poorly educated seems constant.

In Germany, the crucial dispute about continuing education concerned urban, male youngsters. Apprenticeship training, controlled by the craft and industry, was still the dominant form of vocational education in the period of rapid industrialisation, urbanisation and migration of late 19th century. In many regions, attendance at general – often-religious – continuing school had already been obligatory for young people. Because of the erosion of familial forms of upbringing, the integration of occupation and citizenship was endangered among small entrepreneurs and workers (Greinert, 1990; Stratmann, 1990; Wahle, 1994). Furthermore, industrialisation threatened the prevailing social, economic and political order: big, export-oriented industry undermined the status of crafts and industrial workers represented a danger of socialism and revolution. However, was that instead of crafts and industry, vocational schools were initiated by the alliance of primary school teachers and politicians (*Deutsche Verein fur das Fortbildungswesen*, founded 1892-96), supported by educationalists, accepted by industrialists and gradually also by the crafts sector. In striking contrast to other cultures, in Germany the educationists – such as Georg Kerschensteiner and Eduard Spranger – made the effort to develop a genuine pedagogical alternative for VET, which would solve this problem. Being vocational, continuing school became a politically (legally adopted) and pedagogically legitimate alternative in secondary education. The crucial point in the stabilisation of vocational schools was that, in connection with apprenticeship, it became part of compulsory education after primary school. However, the price was the dominance of apprenticeship practices in VET led by industry or corporates/chambers and the supportive and general nature of vocational schools in relation to occupation and industry. The religious and bourgeois conceptions of female *Beruf* as citizen and *Hausfrau* geared women's VET into a system of full-time, educational vocational schools, diverging from the male apprenticeship-dominated system (Mayer, 1998). Being the heir of continuing school has had a long-standing impact on the role of the vocational school in German vocational education: as a school of (occupational) citizenship, it has remained cross-occupational and general, compensatory to the civic and academic forms of education for citizenship rather than becoming a distinctive component in developing occupational identity and qualifications.

Despite differences, the Nordic approaches to continuing education were all influenced in the 19th century by the distinctive Nordic enlightenment, a popular-democratic movement with its principle of *folkelighed* (Slumstrup et al, 1983; Gudmunssen, 1995; Jarning, 2002). However, as in Germany, Denmark and Norway, religion had a greater influence on the definition of female occupations and education. It has been argued that especially in Norway (Korsnes, 1997; Michelsen, 1991; 1998) the popular education movement hindered the development of technical institutes, which would integrate technology, theory and practice and would serve national industry. The politically most influential popular-democratic movements maintained a focus on agricultural education.

In Norway trade, craft and manufacturing industries developed quite independently from rural industries (Sakslind, 1998; Gudmunssen, 1995). In the technical sector, part-time schools for apprentices (*laerlingskoler*, *tekniske aftenskoler*) were maintained by local crafts and manufacturer associations. Gaining national independence, first from Denmark, later from Sweden, was a shared interest among the State, church and popular-democratic movement.

'Folk enlightenment' and societal participation, promoted through 'folk schools' and 'folk high schools', were fundamental from this perspective. While the gymnasium maintained its superior status, it increasingly became geared to preparing or complementing academic education. According to Michelsen (1998) female teachers were initiators in developing specific vocational continuing schools in Norway, as part of the bourgeois-feminist movement. Female teachers had organised themselves separately from male teachers, who were primarily from agrarian backgrounds. During the 1910s to the 1930s women tried to establish an obligatory, practical Youth school (*ungdomsskole*) to continue 'folk school' based on pedagogical ideas of *Arbeitsschule* in the style of Kerschensteiner. As it was seen as part of women's emancipation and professionalisation, the initiative received minor attention from crafts and industry and no support from the State. It never became a real predecessor for institutionalised vocational education (*yrkeskoler*), while the crafts defended their apprentice-training system and the labour-movement prioritised development of the comprehensive school (*enhetsskole*). Initial VET remained divided into fragmented local part-time schools loosely controlled by industrial associations and into a State-controlled school-based system. The dominance of educational programmes promoting political and social participation remained strong and lead to the creation of comprehensive upper secondary school during the 1970s.

In Denmark, the liberation of trade and industrialisation since the middle of 19th century took place largely as a grass-root process, integrating peasantry and crafts in small towns. The expansion of agro-industry, the cooperative movement and regional self-governance went hand in hand with industrialisation. The popular-democratic movement and *folkelig* enlightenment promoted continuity in collective and cooperative social and productive activities. The crafts and technical associations took the leading role in vocational education and in establishing the first technical institutes (*tegneskoler* which developed into *tekniske skoler*) (Laegring, 1985; Moeller, 1991; Hentilä et al., 2002). The emergence of a new type of small *stationsbyer* along the railways from the 1870s, adjusted rural crafts and industries to the guild traditions of *koebstader* and became crucial in establishing VET schools for apprentices until the 1940s. Initial VET became part of wider concept of popular (community-based) education, which integrated political, industrial and educational aims. The same networks initiated the expansion of vocational schools, as well as later of work camps/youth schools and production schools, as the various forms of 'folk education' (Laegring, 1985; Mayer, 1999; Slumstrup, 1983). The technical associations, representing occupations and controlling school inspection and vocational teacher training, controlled the State subsidies for technical education. The national Council for Vocational education (*Tilsynet med den tekniske Undervisning for Håndvaerkere og industridrivende*), established in 1916, recruited half of the members from working life as well as those from the State. However, occupation-specific schools have remained subsumed into the apprenticeship system controlled by the social partners. The establishment of Youth Schools (*ungdomsskola*) from the 1930s represented a change in conceptions of VET: it was not initiated by crafts or local actors, but by national policy-makers. Its target group was specified as 14-18 year olds and its aim was to combat social problems and unemployment. The employment political function of the school was indicated by its integration into other initiatives like technical

schools and work camps as voluntary alternatives for young people who had finished their compulsory education. It was the duty of the municipalities to establish schools for boys and girls to prepare them for work in most common occupational fields.

Both in Sweden and Finland crafts remained marginal compared to export (metal and wood-processing) industry and rural industries. Popular-democratic movements united small farmers, rural workers and the land-less people with industrial labourers and had gained strongly political character (Kettunen, 1998; Hellspong and Löfgren, 1995). The Nordic social-democratic ideology and the idea of comprehensive school were most influential in Sweden since the beginning of the 20th century. The Swedish concept of *folklighet* may even, in its later social-democratic versions, be influenced by the heritage from a military super-power State, big export industry and large land-owning gentry. In Sweden, popular education was considered the right and duty of the State, which had the mission of developing citizens for the nation-State, into which vocational training was subsumed (Boli, 1989; Lindgren, 1997). Instead of becoming craft and industry-led institutions, evening schools for apprentices/trainees (*Söndagsskolar* which developed into *Lärlingsskolar*) were maintained by municipalities and supported and controlled by the State (Larsson, 1995; Englund, 1986). The National Board of Education (*skolöverstyrelse*) was established for grammar schools in 1904, but since 1918 it included a department of VET for trade, crafts, industry and home economics. Initial VET became increasingly developed through workshop schools as part of State-supported, full-time municipal school-system (*praktiska ungdomskolar* which developed into *verkstadskolsystem*). The initiatives were socio-political in combating unemployment and migration of labourers, but they were also supported by modernising industry, which preferred technological training and more advanced skills than the experiential learning in the evening schools could provide. Other branches of VET were linked to their branch administration, but since the department transformed into National Board of VET (*yrkesskolöverstyrelse*) in 1943, they gradually became integrated into vocational component of comprehensive education.

The Swedish approaches indicate the emerging self-conception of the social-democratic State as having a privileged and progressive perception of people's educational needs. This may be one reason for the lack of interest in the occupational functions of school: 'As a matter of fact, social democracy has not been interested in school as such, but only in how it has functioned as an instrument in reforming society' (Lindgren, 1997; p. 2). However, arguments are also given about the importance of general education, initiated bottom-up by the agrarian people (especially prosperous farms) because of utilitarian and pragmatic reasons, not because of top-down implementation of mass schooling for citizens of a democratic nation-State (Lindmark, 1996). The proportionally wider bourgeoisie in Sweden also had more interest in gymnasium education, especially in the transmission of patterns of family-life in separate schools for girls. Comprehensive education was a springboard, when VET was integrated in the 1960s into a unified system of education, including administration and teacher training (Swedish Government, 1962). Norway and, to lesser extent, Denmark accompanied Sweden during the 1960s and the 1970s in expanding the idea of comprehensive education to upper secondary level, even if the internal streaming of pathways continued. In Finland the

initiatives on youth school since the 1970s were never realised, and the distinctiveness of VET as a form of education, despite its school-based organisation, was retained.

In Denmark and Finland vocational education became a real alternative to continuing education: in Denmark as an integration of apprenticeship and school, controlled primarily by industry itself, in Finland as State governed schools, controlled by industries through State and by networks of representatives of industry, occupations, civil servants, schools and teachers. While popular-democratic ideas were dominating all Nordic educational programmes, the struggle against integrating vocational into comprehensive post-compulsory school was strongest in Finland. Furthermore, though German continuing education transformed into separate systems of dual vocational and academic education, the principle of occupational citizenship seems to have become equally important in Germany and Finland.

8.4. Continuing education and models of VET

The Nordic political and research discussion on continuing school has almost exclusively concentrated on the relations between gymnasium/middle school and 'folk school' and on the unification of compulsory school through its academisation (e.g. Rinne, 1984; Jauhiainen, 2002; Jarning, 2002). Therefore, it has been attractive to adopt system-functional paradigms on models of VET, which have originated from Germany and circulated and reformulated in Europe. Following the paradigmatic German interpretations, research tends to consider VET from the perspective of 'regulation, systems and institutions' (Luhmann, 2002). Legislation, financing and organisation into interest groups are criteria for recognising and differentiating school-based and work-based education and learning. In addition, crafts and manufacturing industry become standards, because of their crucial political and economic role in the making of the German nation-State and economy. Work and its occupational forms have become exclusively defined as male *Beruf* in the manufacturing industry. The analyses of VET interest groups concentrate on the role of *Mittelstand*, on organising workers/employees and companies/employers into social partners negotiating their interests on VET. Finally, the role of State is reduced to a separate, bureaucratic player in the tripartite interest struggle on regulatory power and financial obligations.

The first criterion makes it understandable why Nordic researchers tend to copy such universalising models: the focus on systems and institutions has enforced their exclusive interest in 'folk' school, gymnasium and university, which all have been organised and discussed as national issues under church or State governance ([58]). However, the development of Finnish (or Nordic) VET in relation to continuing education may raise questions about the universality of adopted models. In the formation of VET, schools were no more separate than the State from cultural, political and economic movements, with their different well-articulated aims and objectives concerning the future.

([58]) And as part of their personal history, are closer to their life form and self-concept as well.

In the Finnish case, since the 19th century VET has been embedded in the projects competing for developing industries, occupations and governance, which potentially would become national and constitute a system (Heikkinen, 1995; 2000a; 2000b; Heikkinen et al., 1999). The school-based character of VET was important precisely in its potential to promote industries and the occupationalisation of work. Even with varying power and influence, the projects were operating through administration: the ministries, departments and boards became the headquarters for their articulation and stabilisation. The promotion and governance of VET remained integrated in the promotion of industry in branch-ministries until the 1970s (Annex 1 shows the position of VET in national governance). The State was engaged in different programmes promoting industries and politics. For example, the main contributors to the debate on continuing education – the followers of the Fennoman movement representing agricultural Finland and the proponents of industrial Finland – channelled their political and economic projects through the Board of Education and Ministry or Board of Trade and Industry respectively.

Moreover, the Finnish word for occupation used to be *elatuskeino*, meaning means of livelihood (later in the 19th century *elinkeinoammatti*, meaning occupation as a means of livelihood, nowadays *ammatti*). For most of the population this meant, until the 20th century, all kinds of tasks, which were recognised as necessary for independent life, in the totality of an agrarian household. At the individual level, *elatuskeino* could be a craft, office or service. Even in later conceptions of wage-labour and the individual worker, the collective aspect of occupation remained important. For example, wage-work in a factory could be conceived as a family occupation, and other members of the family, especially women and children, could substitute or support the person actually contracted. In the agrarian household as a collective enterprise, women in particular could change tasks and roles (Heikkinen, 1995; 2001; Peltonen, 1992; Apo, 1995). In Swedish, *yrke* (occupation) substituted the earlier holistic expression *näring* – activity for livelihood or nutrition in rural household – and started to refer to specialised and individualised work (Hellspong and Löfgren, 1995). Despite the increasing importance of occupational work, the Nordic concepts can hardly be substituted by the concept of (male) *Beruf*.

In Norway and Sweden, education for the household was more closely linked to general education and female citizenship than other areas of VET, which indicates greater similarity to German concept of the female *Beruf* (Michelsen, 1998; Mjelde, 2001; Mayer, 1998). In Finland, household and home industry were dominantly conceived as occupational parts of the totality of rural work, later as distinctive occupations. Home industry was not only female work: potentially it was mediating between the subproject of crafts in the projects of both industrial and farmers Finland. Other important inputs for Finnish conceptions of work and occupations originate from nursing and social work. They have amalgamated popular conceptions of care in holistic production-consumption of agrarian households and the androgynic concept of skilled work as occupation with the bourgeois idealisation of femininity with its exclusive occupational dispositions. In Finland the principles and forms of female-dominated occupations and VET have become comparable with the male-dominated. Therefore, the schooling paradigm in women's VET did not indicate its integration into, but

occupationalisation of work and differentiation from, education for citizenship as in all VET. The success of the project of industrial Finland since World War II promoted technical work and occupations as ideals for all VET, but not without impacts from other occupational branches (Henriksson, 1998; Heikkinen, 2001) ([59]).

The concept of middle class should also be historically and culturally contextualised: an educationally open concept of *Mittelstand* could support understanding the development of VET as a mediator between varieties of upper and lower social strata in different nation-States. Linked to this, the concept of social partners has historical importance only in Denmark and does not even exist in the Finnish language. Often Nordic researchers claim that the development of (technical) VET was hindered, because the 'middle-class' was forced to compromise with the popular-democratic movements, rooted in agrarian societies with their socio-political programmes (Heikkinen, 1995; 1996; Korsnes, 1997; Kettunen and Rissanen, 1995; Kettunen, 1998; Michelsen, 1998). The programmes of industrial and educational modernisation had to recognise and respect them and adjust to their needs and aims. However, at least in Finland and Sweden, crafts, small enterprises and shopkeepers never became a quantitatively or qualitatively crucial societal group nor made up a *Mittelstand* in the German sense. On the contrary, from farmers, industrial and service workers together with civil servants became the typical Nordic nations of middle-class, with minor interest in craft or small entrepreneurship.

In 19th century Germany the central political role of small crafts and trade as a counterweight to industrial workers and unions had to be adjusted to the growing importance of the large export companies, which operated at the nation-State level. This was reflected in the tripartite governance and organisational solutions of VET. Only in Denmark, with its small towns and strong cooperative movement and domination of agro-industry and domestic manufacture instead of big manufacturing export industry, was a *Mittelstand* integrating the traditions and interests of agriculture and crafts developed (Moeller, 1991; Hentilä et al., 2002). In Finland, the collaboration of the large wood-processing and metal industries with the politically important small farmer-*Mittelstand* was facilitated by the State; in Norway local politics and administration was crucial in negotiating the development of the nationally fragmented industries of sea fare, trade, fishing and wood-processing. In Sweden domestic and export markets have both been important for national economy. Big farms, big industry and traditional (military) gentry facilitated the development of a strong consensual State, which promoted the ideology of a collective *Mittelstand*: the Swedish 'folks home' where all citizens become middle-class. In Nordic *Mittelstand* solutions, comprehensive experience and

([59]) One important factor, which is marginally discussed in comparisons, having influence in differentiating the conceptions of the occupational form of work especially during the 20th century, has been the role of immigrant or guest labour. Narotzky (1997) emphasises the importance of cheap migrant labour for industrial development in Germany and France, and compares it with the implications of colonial slavery and cheap labour for the emerging divisions of work in countries like Spain, Portugal and the UK. It was remarkable in Sweden and Germany still during the 1960s and the 1970s. The more universal principle of occupational form of work and vocational education in Finland may thus partly be due to the homogeneity of the people both as workers and citizens.

citizenship were primary, intellectual and technological progress secondary in educational reforms.

Instead of social partnership, Norway, Finland and Sweden developed legalistic patterns of negotiating work and VET at national level. The specific Nordic version of social democracy adjusted itself to the agrarian, free peasantry tradition. Kettunen (1995) has shown how, from the beginning of the 20th century, it was typical for Nordic countries to integrate the concept of collective industrial labour to the ideals of an independent farmer and owner of one's work, opposing these with the capitalist employer. In Finland this phenomenon was more influential, because citizenship was traditionally rooted in the status of the farmer. This became visible in the internationally exceptional mobilisation of labour movement around rural workers, crofters and landless people. The politicised nature of industrial relations after national independence and civil war (1917-18) pushed negotiations towards national legalistic, corporative regulation of work conditions. As in Sweden and Norway, the representative, consensual negotiations between Finnish employers and employees at local and national level have become interconnected and moderated by the public sector.

The governing patterns in VET have been more continuous in Germany than in Nordic countries (Deissinger, 1993). Denmark has resembled Germany in maintaining strong links between industrial, technology and vocational education policies. In other Nordic countries the negotiation systems and actor-networks in different policy areas seem increasingly to have separated (Korsnes, 1997; Larsson, 1995; Heikkinen et al., 1999). Finland resembles Germany in having looser links between VET and the ministries or departments of church and education. While Norway and Sweden were pioneers in creating a comprehensive upper secondary system in Europe, their lower level vocational schooling gained a more prevocational character than in Finland. Consequently, in Norwegian and Swedish education recognition of VET and practical learning became weaker and of lower in esteem than in Denmark and Finland.

8.5. Political implications

The constitutive role of educational researchers, including historians, has developed over a period when culture, society and nation-State have become more or less synonymous and overlapping (Wagner, 2001). However, increasingly their interpretations and narratives are being used in varieties of transnational projects of VET. Which stories and mappings of the world are going to have currency in transnational discourses and with which consequences? What could be the alternatives for universalising models of VET in transnational or cross-cultural research on vocational education?

Psychological and didactic approaches have always been attractive to educationalists and researchers, because they enable decontextualised and universal interpretative frameworks. There seems to be continuity in the psychological approach to different forms of education, which are based on psychological differences among learners and learning. Whether it is

abilities, attitudes and dispositions or motivation, the form and mode of education should be adjusted to the individual characteristics of the learner. Another attractive alternative are sociological and system-functionalist approaches, which consider different forms of education and their institutionalised modes in relation to societal and economic hierarchies and statuses. It provides an opportunity to compare the functioning of educational pathways and institutes across societal and economic systems, identical with nation-States ([60]).

However, what are identified as systems of VET may represent the hegemonic, victorious cultural programmes which, especially since the World War II, have been joint constructors of nation States, national economies and industries. Therefore, commitment of researchers and policy-makers to certain models, derived from certain, selected systems of VET, may support promotion of certain new hegemonic programmes of VET, now as joint constitutors of transnational policies, economies and industries. A nonconformist alternative could be to deconstruct the emergence and transformation of national 'systems' as outcomes of competition between cultural programmes of VET, carried out by individual, collective and meta-collective actors striving at certain subnational, national and supranational aims. The cultural approach propagated in this paper, conceives education as joint constitutor of culture as projects or programmes at personal, collective and at societal levels. The differentiation of education is due to the complexities of cultural projects, where individual growth processes and life-courses, transformation of collective life forms and societal formations intersect. In most European reflections on education, only polarisation between academic and vocational forms of education are discussed. The Nordic history of education, however, reminds us of the importance of a more complex view, where the different forms of education are considered from the perspective of individual and collective growth processes, in relation to their political functions (Heikkinen, 1995; Heikkinen and Sultana, 1997). This demands historicising and contextualising reflections on the interdependences between actors, cultural programmes and conceptions of education in subnational, national and transnational frameworks.

The debates on continuing education can be considered as confrontations between main forms of education, which are transforming in relation to each other. In the Finnish context, one basic form of education emerged as popular or citizenship education. It materialised as initial education in 'folk schools' (comprehensive) and as 'folk enlightenment' in adult education institutes. The basic pedagogical idea in 'folk education' has been the promotion of participation in the life of the family (households), community and nation-State. In the holistic

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([60]) Does the characterisation of 'models of VET' do justice to Weber's idea of idealtypes? Korsnes has pointed out that Weberian idealtype is an ideational picture that is not historical reality, and absolutely not the real reality, and that is even less suited to serve as a form into which the reality *qua exemplar* can be classified, but rather is meaningful as a purely idealistic boundary-concept that reality is measured by in order to clarify certain significant components of its empirical substantiality, which it is compared with. Such concepts are images, consisting of interrelationships that are constructed by application of the category of the objective possibility, that by our reality-oriented and trained 'imagination' are judged as adequate (Korsnes, 2001). However, could it also be that Weber struggled between political expectations about developing classifications of (mapping) the world and his engagement in understanding the world as complex and controversial transformations? Could idealtypes represent a compromise, apology and excuse for developing politically exploitable interpretations?

conception of life, participation has included work and occupations. Another form of education can be characterised as academic education in gymnasia and universities. The guiding pedagogical principle has been to promote participation in, and production of, bodies of knowledge, organised into disciplinary structures and practices. It implies transcending and overcoming the boundaries of specific forms of life, also occupational life. Still, academic education has also included ideas of citizenship and occupation (profession), which considers the good of the people, communities and nation (or nations) from a more universal perspective. Vocational education can be distinguished as a third form only in relation to the previous ones. It has come to focus on participation in the world of work, in an occupationally structured society, through specialised skills, technical expertise and trade, which constitute people's occupational identities.

A shared historical tendency, which can be recognised cross-nationally, is the penetration of academic education into all other forms of education. However, the imperatives of economic relevance and manufacturing of proper characters for globalising markets may furnish this instrumental version of academic with distorted versions of vocational and 'folk education'.

Annex 1

Figure 8.1: Students in apprenticeship training (1875-80: certificates) compared to school-based VET in all branches

	Apprenticeship contracts	Students in schoolish VET	Percentage of apprenticeships in VET
1840	1 741	~1 000	–
1875	220		
1880 (a)	125	~4 000	–
1924 (a)	250	15 400	1.6
1930	1 179	20 312	5.5
1960 (a)	3 159	53 196	5.6
1970	2 687	98 706	2.7
1980	5 157	137 908	3.6
1990	7 235	162 535	4.3
1993	10 025	199 525	4.8
1995	12 719	203 134	5.9

* 1879, 1923 and 1992: Trade Acts/Acts on apprenticeship; the 1960s: influence from reform of apprenticeship programmes in the 1950s; until the 1960s apprenticeships were formally recognised mainly in crafts, manufacturing and retail; since the 1980s apprenticeship is primarily adult education, which can take place in most occupational branches. In the 1990s comparisons are difficult, since half of the previous VET were transformed to HE as polytechnics (AMK institutions).

Source: Heikkinen, 1995, 2000a; Heikkinen and Sultana, 1997; Heikkinen et al., 1999

Figure 8.2: Schools and students in school-based VET from the 1840s until the 1910s (registered, supported)

	1840		1850-60		1870-80		1890		1910	
	Sch	St	Sch	St	Sch	St	Sch	St	Sch	St
Schools for agriculture	1		1	30	8	200	14	362	39	1 066
Schools for forestry					1	10	1	10	5	170
Schools for animal husbandry							2	8	40	531
Schools for dairy farming					2	30	20	185	7	123
Schools for horticulture	1		1	15	1	15	5	30	5	63
Schools for home economics							10	100	25	843
Commercial schools	1	50	1	50	2	120	7	450	30	1 975
Schools for seafaring	3	90	3	90	6	150	7	156	6	170
Schools for home industry					4	80	58	3 173	109	2 065
Vocational schools	15	700	23	1 900	32	2 500	35	1 286	62	3 714
Technical schools			3	70	5	625	7	689	13	1 588
Nursing schools							1	9	2	30

Sch = schools
St = students

Figure 8.3: Transformation of Finnish continuing education/school

Periods	Initial stage 1870s-1920	Difficult years 1921-1944	Practical school 1945-1957	Civic school 1958-1970	Comprehensive 1970-	Intermediate (Integrative) education 2000-
Legal Status	Education Act 1866: Recommendations on continuation	Education Act 1921: school obligation, in different schools with different curricula	Education Act 1943: obligatory attendance of continuation school	Education Act 1958: civic school as part of tripartite secondary education; civic, middle, VET schools	Education Act 1970: unification of lower secondary education	Education Act 1998 and recommendations: special education and counselling part of lifelong learning
Pedagogy	Ethical and political education for citizenship	Struggle between occupational and citizenship education	Distinctive mission as practical and educational youth school for less-gifted	Individual-psychological and societal legitimisation of different curricula	Equal opportunities, individualisation, 'practical subjects' in curriculum	Distinctive special pedagogy and counselling in VET
Relation to VET	Component in wider projects of Finland and Finnish industry	Controversy among educational actors: VET school as potential alternative for compulsory school	VET schools developing distinctive pedagogy and mission Peaceful co-existence of civic, vocational and academic education	Competition with academic lower secondary, VET remains separate	Comprehensive school precede VET schools, controversy between vocational and academic upper secondary	Preparatory and compensatory measures for lower VET
Students	Majority of young, 'victims' of Civil War 1918-	Rural youngsters, girls in towns	Rural youngsters, urban working class, 'victims' of World War II	Rural and less gifted youngsters		Poor and demotivated learners, primarily male youngsters

Source: Heikkinen, 1995; Heikkinen and Henriksson, 2002; Heikkinen and Lamminpää, 2002; Jauhiainen, 2002.

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9. The production school concept as Europe's first didactically guided vocational training model

Johannes Meyser

9.1. The production school concept and modernisation

As a vocational training concept, the production school principle combines learning and work, theory and practice, qualifications and sales-oriented production in a targeted manner. This training precept originated in Europe. It has a long, if interrupted, tradition, but is still very modern.

It was first established in France during the 18th century as a form of didactically conducted vocational education and training, and, as industrialisation grew, was systematically developed to meet the increased demand for qualified skilled workers. It was directly influenced by the evolution and transformation of industrialisation, the structuring of appropriate production processes and their logistics and by European society modernisation.

The French schools were extremely influential during the establishment of vocational training institutions in Europe. Similar production schools were founded in almost all countries during the 19th century. In the early 20th century they lost their prestige in some countries and were partly replaced by other forms of skilled worker training. Towards the end of the century, however, the production school model saw something of a revival and is still an applied form of vocational training (Meyser, 1996).

Although production schools continue to train skilled workers within the context of international vocational training schemes, (Greinert and Wiemann, 1993), advanced industrial nations see them as the solution to higher training and educational policy expectations and also as a means of sponsoring those disadvantaged by modernisation through change in production techniques and economic conditions.

The production school concept is still thoroughly contemporary and a topic of current debate (Kipp et al., 2000).

9.2. The *Écoles d'Arts et Métiers* in France

The evolution stages of French production schools generally correspond with those of early industrialisation in France. The schools were the result of a programme to support trade. This 19th century programme involved economic policy in a much broader sense than the term is used today, for its aim was to create a new middle management elite for factories and to establish internationally competitive industry.

9.2.1. Phase I (1780 to 1803): vanguard of vocational training according to the production school principle

Even under the *ancien régime* attempts were made to introduce the 'English method' in agriculture and manufacturing by means of training measures. Innovations were introduced, machines and technicians imported, and the first steps to disseminate this new knowledge through vocational training were taken.

In accordance with these new objectives, the Duke François-Alexandre Frédéric de La Rochefoucauld-Liancourt (1747-1827) developed the project of founding a school in his duchy at Liancourt (vicinity of Compiègne/Oise) in 1780. This was to offer both theoretical and practical training. The pupils were exclusively army orphans and the sons of soldiers. The practical instruction took place in workshops and was given by master craftsmen from the duke's Dragoon regiment (Day, 1987). La Rochefoucauld employed the method of 'relay instruction', involving 'elder' pupils passing on the knowledge they had accumulated to new pupils (Artz, 1966; p. 185).

After visiting the institution – which in the interim had been transformed into an *École Nationale* and been moved to Compiègne – in 1800 Napoleon ordered that henceforth it should train *sous-officiers pour l'industrie*, *contremaîtres pour les manufactures* and *chefs d'ateliers*.

9.2.2. Phase II (1803 to 1815): rise of the *Écoles d'Arts et Métiers*

In 1803 this school was changed into an *École d'Arts et Métiers* in which founders, turners, joiners and cabinetmakers, instead of blacksmiths, smiths, saddlers and military tailors, were trained for work in State-owned factories (Dreyfus, 1903; p. 374).

This first commercial and technical school was moved to Châlons-sur-Marne in 1806, and a second one was founded in Angers in 1815. These schools, now the *École Nationale Supérieure d'Arts et Métiers* (ENSAM), are still to be found there on their original premises.

These specialised institutes, complete with production workshops, were soon among the best European vocational training establishments of their time. Products manufactured by pupils were 'in part supplied to the State, in part sold to private individuals keen to acquire such wares' (*Denkschrift ...*, 1879; p. 29). The profit was sufficient for the workshops to support

themselves. La Rochefoucauld, who in the interim had become General Inspector of Schools, wished above all to promote industry in France. For this reason the manufactured goods were not to threaten private companies and were sold at around the same prices as typical workshops charged.

9.2.3. Phase III (1815 to 1850): consolidation of the *Écoles d'Arts et Métiers*

The insecure and vacillating political situation after 1815 often posed a threat to the existence of the *Écoles d'Arts et Métiers*. In the ensuing years, however, a series of reforms were enacted. The schools' militaristic focus shifted, and the crafts orientation turned now towards the training of mechanics and engineers for industry. The Ministry of Trade simultaneously took over responsibility for the schools from the Ministry of the Interior. The idea of assigning them to the Ministry of Education was never entertained.

French industry was also in increasing need of management personnel and soon the growing number of applicants to the schools in Châlons and Angers could not be accommodated. A third *École d'Arts et Métiers* therefore opened in Aix-en-Provence in 1843.

The existence of the schools was later threatened in the years after the 1848 revolution. In 1850, members of the National Assembly called for the closure of the schools. Industrialists and academics were questioned, and the careers of school alumni investigated. The schools' supporters prevailed; it was concluded that the schools were 'indispensable' as they trained qualified workers who were 'of great worth as skilled workers, mechanics, machine operators, designers and industrial engineers'. It was maintained that the loss of these schools would be 'an indescribably heavy blow to national industry' (*Annuaire* ..., 1851; pp. 16-55). The existence of the *Écoles d'Arts et Métiers* was thus secured.

9.3. A new European vocational training concept

The *Écoles d'Arts et Métiers* were innovative in offering practical vocational training in workshops. 'Learning by doing' was adopted, from the traditional model of apprenticeship to the level of a master craftsman. For the latter, however, it was subject to didactic objectives. The dominion of economic exigencies in all forms of vocational training thus ended. Establishing training workshops not only necessitated a change of training venue, but also permitted an unprecedented break with the real conditions of the workplace. For this reason, France may be considered home of the systematic, pedagogically guided, practical and theoretical apprenticeship tuition. This was also the first time that didactic criteria were selected and applied to practical vocational training objectives. From the outset production was tailored to training interests. Certain company-based practices were replaced, minimised or highlighted. The aim was to create a systematic vocational training process. Training programmes were developed for the workshops and for specialist theoretical instruction.

The training course lasted three years. Entrance examinations were conducted, minimum standards for acceptance were set and the age of course entry specified at between 15 and 17. At the same time, trainer professionalism increased. While in the early days of the production schools its trainers were invalids, soldiers and manual workers, the *Écoles d'Arts et Métiers* now employed engineers, master craftsmen and academically trained teachers.

The schools trained 300 pupils a year. In the workshops the principle of 'onsite training' prevailed, while in the classroom technical drawing, applied mathematics and occupational knowledge were taught together with the general curriculum. The workshops were equipped with steam-driven engines and were superior to the average facilities of modern French companies. Practical instruction was given in four studios (for forging, casting, engine fitting and model building). Each had a workshop director, up to three foremen and one or two trained workers who assisted in training pupils.

By way of 'in-house production', tools and instruments for the various school workshops were manufactured. These included such implements as compasses, vices, spanners, draw plates, files and plane housings. The pupils then built pieces for machine tools and steam machinery and, finally, foundations for heavy machinery, large cogs and cylinders for steam-driven engines which they then assembled.

The pupils were responsible for both making and finishing the parts. Each student would take charge of a work team. This was to prepare them for the role of supervision. At the end of training a student was expected to be able not only to use and maintain tools, implements and machinery, but also to understand their construction and function. Additionally, they were expected to instruct other workers (*Archives Nationales*, 1863).

France had thus developed and implemented the first systematic, didactically structured vocational training concept in Europe.

9.4. Contextual origins of the production school concept in France

The development of production schools as training establishments for skilled workers is closely related to the multifaceted modernisation of French society. Here we can identify five key factors.

9.4.1. Late development of French industrialisation

Catching up with England, the more industrially developed nation at the time, to avoid loss of power was a significant motive for the early foundation of the French production schools. The intention was to encourage technical and economic expansion to reduce the English lead and to compensate for the delay in industrialisation. If we take the share of global industrial production as a criterion for improvement, we can see that in 1750 England's foothold in the

market, 1.9 %, was only about half as large as France's 4 % share. By 1800, England had not only caught up with the French but was taking an increasing lead. In 1880 England's share of the market was 22.9 % to France's 7.8 % (Kennedy, 1991; p. 237). The French lacked an adaptable market, low transport costs, business and technical skills, steady cash flow and a social and political climate that would favour mobility of personnel and resources. There was a need for much stricter State intervention. As a consequence of the debate on the function of the English 'practitioners', who were responsible for industrial progress and the accompanying economic advantage which rendered training schemes in England superfluous, the vocational training schools with their accompanying workshops evolved in France. Specific training modes thus became a new production factor.

9.4.2. Deposition of the guilds

The increasing fragmentation of both production methods and the social system led to the dwindling significance of guilds in the late 18th century. Their internal dissolution and their final abolition, sanctioned by the French Revolution, was a stimulus for new organisational and institutional concepts of vocational training. Since all intermediaries between the State and individuals had been removed (Schriewer, 1986), and as the traditional craft-trade training forms were not competitive, the State was itself obliged to develop and realise new concepts of vocational training.

9.4.3. Technical and scientific progress

Entirely new machinery and materials were increasingly employed in production. This required an unprecedented and growing supply of vocational and technical training which could no longer be furnished by experience alone and *en passant* during practice. In the early 19th century the onus was on applying new, didactically guided training concepts which replaced simple learning by imitation. The application of science to technology, in which France was by this time world leader, led to the application of such values to vocational training, systemisation and the inclusion of theory in vocational instruction. At the same time a structured, practice-based form of training was proving more and more indispensable. The foundation of the *Écoles d'Arts et Métiers* fulfilled both requirements. The subsequent transformation of early production schools into State-run technical institutes could take its lead from the established colleges for engineers (*École Militaire*, *École des Ponts et Chaussées*, *École des Mines*, *École Polytechnique*).

9.4.4. The philanthropic movement

Efforts to instigate pedagogical reform in the late 18th century were mostly influenced by the Enlightenment, which stressed humanistic ideals and a scientific world view. Reason, criticism, freedom of thought and religious tolerance were to replace the absolute authority of Church and State, moral prejudice and corporate privileges. This involved, for the first time,

recognising the individual and the social potential of systematic education. The philanthropic, utilitarian and industry-oriented concepts laid particular stress on the degree of 'common utility' of a thus-educated individual and explicitly referred to the fields of work and occupation.

La Rochefoucauld drew on the growing German philanthropic tradition of pedagogical development (Basedow, Salzmann, Trapp, Campe, Pestalozzi, Simon, Iselin, Schweighäuser). His emphasis on a clear vocational pedagogical approach exceeded even this conception. However, the essence of his intentions to promote integration may be seen in the inclusion of the socially disadvantaged (such as military orphans) in society by means of vocational training. The socially integrative function of production schools is still partly apparent, particularly in Danish institutions.

9.4.5. Personal influence of La Rochefoucauld

The tenacity, rigorousness and influence of La Rochefoucauld over almost half a century was one of the most significant factors in the development of the *Écoles d'Arts et Métiers*. As a member of the French nobility, incumbent in top political positions, he was able to provide huge support for the founding of the schools. He had contact with the leading figures of the day (including Young, Voltaire, Diderot, d'Alembert, Condorcet, Quesnay, Turgot) and thus had access to contemporary findings and thinking in agriculture, philosophy, sociology, education and economics, which he wished to disseminate in France. In England he gained familiarity with modern production methods and machinery and visited factories for days on end. On returning from the US he introduced smallpox immunisation in France and reformed the prison service. He learned about pedagogical and philanthropic concepts on his travels in Germany and Switzerland.

La Rochefoucauld left a lasting impression on commercial and technical development in France and its territories, and was instrumental in the fight against poverty and in improving training and social conditions in France. He created an extensive welfare system for his workers, which included support for the unemployed and the old and free medical care (Day, 1987; p. 70). In cooperation with Benjamin Delessert he created the first savings bank of France and was the first president of the *Caisse d'Épargne et de Prévoyance de Paris* (Primault, 1988; p. 120). His endeavours thus even shaped the accumulation of capital, which was a vital prerequisite for industrialisation of the country. His vocational training programme was hence part of an extensive system of progressive measures.

9.5. Objectives and realisation of the production school concept in Europe during the 19th century

During the 19th century, production schools appeared throughout Europe within the context of State-promoted free enterprise and the decline of the guilds. The rise of industry, the growth of national markets and an increase in international competition led to symptoms of decay among the old production and qualification systems. Craft-trade apprenticeships were no longer appropriate to the times and were in a serious state of crisis. This lent strength to the foundation of production schools. Three motives were decisive:

Motive	Function of production schools
Crisis anticipation	Social integration
Stabilisation of commerce	Skilled worker training
Industrial development	Training of a technical elite

These three motives for the founding of production schools adopted their own practical expression, which in turn generated typical structures that can still to be found in modern production school approaches.

9.5.1. Production schools as crisis anticipation

Production schools had the general effect of combating unemployment and poverty among large sections of the population and of integrating people disadvantaged by modernisation into society. To these ends, schools for weaving, basket-making, wickerwork and lace-making, etc., were founded, all of which were designed to promote ‘household diligence’ and ‘household industry’.

9.5.2. Production schools and the reform of craft-trade training

These institutions chiefly intended to stabilise threatened craft trades by providing them with qualified personnel. Such training centres were created for training artisans such as cordwainers, carpenters, smiths, ironmongers, and watchmakers. They also supported artistic crafts and particularly rare professions such as musical instrument construction, ivory and artistic carving, coral and meerschaum-working, glass-blowing and pottery, etc. Such institutions, like the ones mentioned above for combating poverty, established themselves more solidly in regions where the infrastructure was weak and industrialisation could hardly be expected even in the long term.

9.5.3. Production schools and elite training

Production schools of this kind were 'model enterprises' equipped with the latest machinery and appliances and intended as examples to encourage development in industrial plants. They converged in areas with insufficient technically and organisationally progressive businesses. They were intentionally created where significant technological and structural change in production methods were required and where a more traditional training approach could not meet demand. They were generally designed to train several hundred pupils a year.

They grew up in economically active regions or their vicinity. In these areas it was possible to recruit workers, acquire contracts, find employment for former pupils as foremen and to optimise the technological and organisational practical influence of the school. Such methods most successfully fulfilled the goal of accelerating industrialisation with the help of the production schools.

9.6. Production schools and power hierarchies in Europe

The State had a direct interest in technological training in the 19th century, and considered it a sign of national, military and economic prowess. In the competition between European nations it was undoubtedly a goal of government influence (Flora, 1973). The French production school concept had enormous impact on other European countries. Like France, powers such as Russia, Austro-Hungary and Germany, were at risk of losing position to England (and France in its wake) if they should fail to introduce training measures. The relative tardiness of the individual countries can be noted and observed under the criterion of economic strength and in State interaction within European political and military power structures (Lundgreen, 1973; p. 38). Shares of world industrial production between 1830 and 1900 are given here as means of comparison (Kennedy, 1991; p. 237):

(%)

World industrial production	1830	1900
Great Britain	9.5	18.5
Russia	5.6	8.8
France	5.2	6.8
German States/Germany	3.5	13.2
Austria-Hungary	3.2	4.7

During industrialisation, the balance of power swayed in favour of Great Britain. The relatively stable 'pentarchy of European powers that had existed since 1815' had crumbled (Kennedy, 1991; p. 299). Russia, France, Austria and, to a lesser degree, Germany were called to develop training schools with training workshops as a substitute for the missing industrialisation. This would promote self-sufficient industrial growth and ensure the future of these countries as major powers.

9.7. Production schools and instructional workshop method

In the second third of the 19th century, Victor Karlovich Della-Vos (1829-1890) developed the so-called 'instructional workshop method' at the Moscow Imperial Technical School. Linking workshops with technical schools in the form of factories was already familiar, largely thanks to the *Écoles d'Arts et Métiers*. These had already been established in Moscow. However, the complete separation of basic training from the realm of production for these purposes was completely innovative (Ploghaus, 2003). This facilitated almost complete and hitherto unknown application of didactic objectives to vocational training (cf. the essay by Wiemann in this volume). Learning goals could be determined precisely and more easily monitored. Specialised training, however, mainly took place via the actual production of process.

Combining the instructional workshop method or basic and specialist vocational training permitted exceptionally effective workshop instruction. The production and sale of goods manufactured by pupils had hitherto been a natural procedure, and this practice continued after the introduction of the instructional workshops method. The production school principle and the instructional workshop method are therefore closely related.

9.8. The spread of production schools in the 19th century

The instructive method with its stress on training in productive workshops along the lines of the French model and the affiliated instructional workshop method (*Méthode Della-Vos*) were presented to a wide international public at the 1873 World Exhibition in Vienna. The World Exhibitions in Philadelphia in 1876 and Paris in 1878 also gave considerable attention to vocational training and contributed to the dissemination of the production school concept and the instructional workshop method. Indeed, by 1920, specialised institutes with workshops had been founded everywhere in Europe where industrial potential was to be accompanied by such measures.

France founded new commercial and technical production schools after the loss of the war against Germany in 1870/71. By the early 20th century an extensive school-based vocational training system on several levels was in place. These numbered the six *Écoles d'Arts et Métiers*, four *Écoles Nationales Professionnelles* and 70 *Écoles Pratiques*. We must also mention the 450 *Écoles Primaires Supérieures* in this context, which generally only furnished basic commercial and technical education (Day, 1987; p. 43 f).

Russia's defeat in the Crimean War (1853-1856) finally demonstrated the superiority of the western powers. The lack of capital, low consumer demand, a tiny middle class, the huge dimensions of the land and its extreme climate, combined with an autocratic, centralised state, wary of innovation, had handicapped industrial development in the country and finally crippled its military capacity. Following the French lead, Moscow's and St. Petersburg's Imperial Technical Schools were supplemented by intermediate and basic technical schools.

By 1900, 18 intermediate and 20 basic schools had been created. In addition 19 'craft-based commercial schools' were founded. These focused on training locksmiths, blacksmiths, metal turners, founders, model casters, carpenters, turners, and model carpenters. A total of 13 craftsman apprentice schools and 30 basic trades schools were created, which were run according to the production school concept (Holzmüller, 1902).

Austro-Hungarian political policy was dictated by the pentagon of the European balance of power (Kennedy, 1991; p. 256 et seq.). Any alteration of the economic and concomitant political hierarchy of the other powers jeopardised the country's position. For this reason a concerted effort to keep pace was made by constructing technical schools. Training in connection with practical instruction in school workshops became characteristic of Austrian vocational schools. By 1912, 30 *Staatsgewerbeschulen* (State Trade Schools) with training workshops had been created across the country. The combination of theoretical and practical instruction is still a component of these institutions, now known as *Bundesgewerbeschulen* or Federal Trade Schools. In addition, 220 specialised institutes had been founded by 1912 to replace apprenticeships to master craftsmen. These also incorporated production workshops (Grüner, 1967, p. 125).

In Germany the production school principle never attained the same significance as it did in centrally governed countries such as France and Russia. The business interests of private German companies led to the establishing of company-based training workshops, and thence, in the early 20th century, to the adoption of the production school principle by industry itself. This in turn suppressed State-run specialised institutes offering full qualifications (Grüner, 1977). There was, furthermore, no uniform development in the individual States. If we compare the two largest States, we can see that Prussia was late and tentative in introducing specialised institutes with workshops. This only took place in the shadow of the 'apprenticeship crisis' and the 'training workshop issue' of the 1870s. Bavaria, conversely, was more lastingly influenced by the French and Austrian workshop-based specialised training schools. It introduced the production school principle much earlier and much more extensively. In both States, production schools were introduced for modern, industrial training in mechanical engineering and metal-working. At the same time, technical schools with workshops were introduced for some endangered craft trades and as a means of combating poverty.

Many other European countries also introduced the production school concept. In the face of high-quality French exports, the generalised introduction of training schools and 'public training workshops' was the subject of debate in Switzerland from 1880 onwards. To this day some 50 production schools train around 4000 pupils annually (in total approximately 2 % of all Swiss apprentices) – particularly in the *francophones* cantons – as electricians, engineers, precision engineers, dressmakers, graphic designers and gardeners, etc. They train the majority of workers in some occupations. This is true of violinmakers (100 %), potters (around 85 %), precision engineers (around 70 %) and watchmakers (around 60 %). These 'public training workshops' receive some State funding and school subsidies, but also create revenue by selling goods they themselves produce (Gonon and Müller, 1982).

Belgium, and the Netherlands, Scandinavia and the Romance countries founded specialist schools equipped with production workshops in the 19th century. These, however, did not always attempt to train industrial managers, but, instead, were oriented towards a general education with socially integrative goals.

Staff continuity in organising and managing the sponsoring establishments was of supreme importance in establishing and maintaining production schools. La Rochefoucauld (1747-1827) in France; Della-Vos (1829-1890) in Russia; Dumreicher (1845-1908) and Wilda (1838-1907) in Austria; and Bücher (1847-1930) and Reuter (1838-1911) in Germany were outstanding and influential personalities, capable of developing the schools over many years and in the face of considerable resistance.

9.9. Decline and revival of the production school principle in the 20th century

While the foundation of production schools in the 19th century focused on training and educating a technical elite of skilled workers, in the 20th century the industrialised nations were primarily concerned with establishing broad training models to qualify a large number of skilled workers. Production schools did not really suit this goal.

9.9.1. Decline

The continuing worker demand in industry and the accompanying growth in productivity had eliminated social crises and led to an increase in the real income of those disadvantaged by modernisation. For this reason few production schools were created in the early 20th century, and many of those founded in the 19th were not able to safeguard their existence in the long term. They were merely symptoms of transition.

Some of the specialist and commercial schools with workshops that had been founded to train a skilled worker elite in the modern industrial sector managed, however, to persist. The Metalworkers School in Winterthur (Switzerland) and the Vocational School for the Metal Industry in Iserlohn (Germany) still offer above-average specialised vocational training. In addition, some production schools founded in the last century to train people for rare professions such as violinmaking, wood sculpting, carving and watchmaking have survived, particularly in Germany and Switzerland. Equally, a good number of the schools have since become engineering schools, as is the case with the *Écoles d'Arts et Métiers* in France.

Broadly speaking, however, most production schools lost their relevance in the 20th century. This was also a direct result of widespread adaptation of the instructional workshop method that was becoming the prevalent form of vocational learning and was considered the typical industrial training principle.

9.9.2. Revival

Even now the production school principle, having over time assumed a variety of forms, is accredited with having played a special role during the structural transformation of production processes. Indeed, a second wave of production schools has appeared since the 1970s and the 1980s. These establishments are largely motivated by the following factors:

(a) reaction to structural changes in industrial production;

(b) minimisation of training expenditure;

(c) industrial training in developing countries;

(d) integration of the disadvantaged.

The last few years have witnessed the emergence of socially integrative models as well as schools training a technical elite.

A geographical divide is nonetheless apparent. In industrialised nations, new production schools are almost exclusively socially integrative. Denmark, for example, has constructed a broad production school system, and many other countries are exploiting the possibilities of motivating pupils which the production school system offers.

Comprehensive, professional, didactical elaboration of the production school principle has hitherto only been conducted in developing countries. This has produced some of the most modern establishments for training a technical elite (Greinert and Wiemann, 1993). This fact confirms the hypothesis that we can respond to the need to modernise not only by means of new technology, but also by developing modern training strategies. This will not necessarily involve taking predecessors as models; it is more a matter of developing or modifying concepts which offer the possibility of more rapid industrial growth.

Annex 1

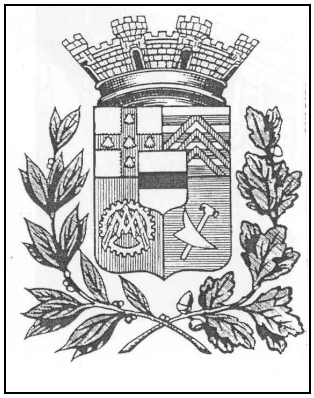
Figure 9.1: The École de Métiers *in La Rochefoucauld's duchy*

Photo: J. Meyser

Figure 9.2: The founder of the Écoles d'Arts et Métiers*: Duke François-Alexandre Fréderic de La Rochefoucauld-Liancourt (1747-1827).*

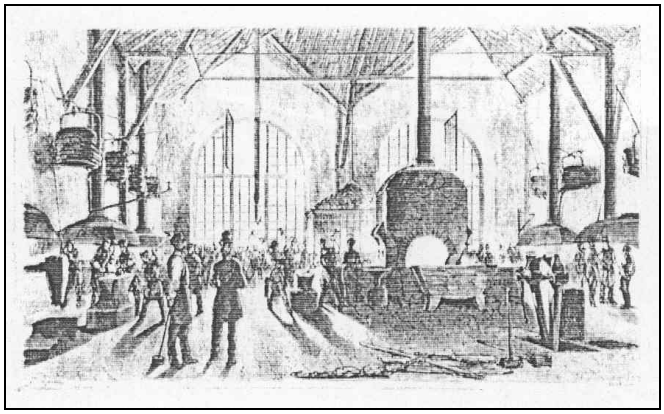
Source: Dreyfus, F. 1903, p. 1

Figure 9.3: The Liancourt coat of arms with the emblem of the Écoles d'Arts et Métiers*.*



Source: *Bulletin de la Société Archéologique, Histoire et Géographique de Creil et sa Région*. January 1988, No 139, p. 27.

Figure 9.4: Pupils working in the smithy at the École d'Arts et Métiers *in Châlons-sur-Marne, 1850.*



Source: Primault et al., 1988; p. 300.

Figure 9.5: Portal decoration at the École Nationale d'Arts et Métiers *in Paris. Art and commerce meet.*

Photo: J. Meyser

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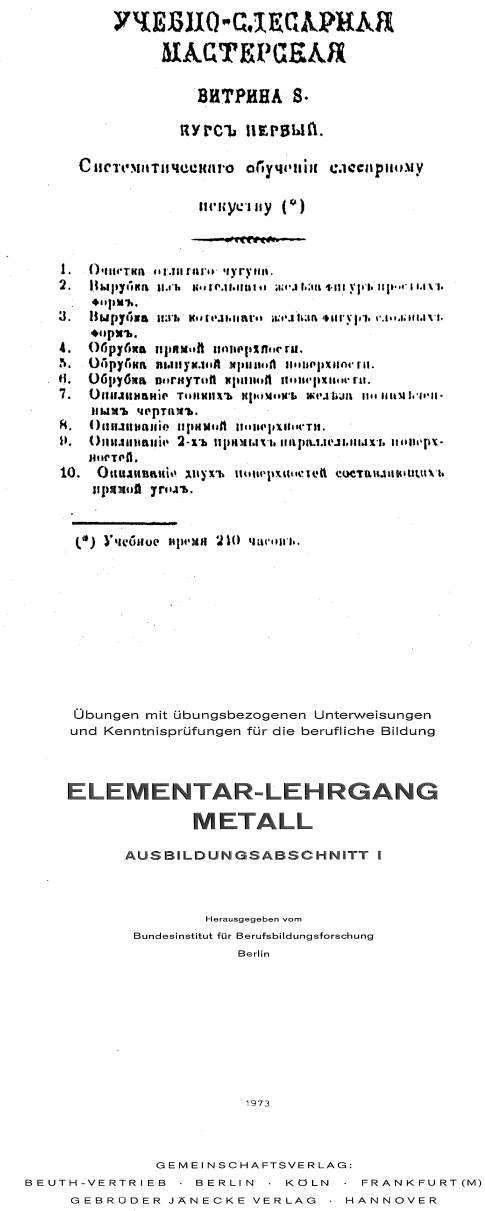
10. *Lehrgangsausbildung* ([61]): a European prototype of a universal industry-based training method

Günter Wiemann

‘One only needs to glance at the list of objects in this collection or scrutinise the exhibited models to convince oneself that the apprentice who performs all tasks and thus the entire programme under the teacher’s supervision will become acquainted with all the skills of this trade in the most rational way. It is clear that such systematic training makes it easy for the teacher to monitor the apprentice and assess his progress. The teacher merely has to check which pupil has satisfactorily executed a particular programme task, and then demonstrate and explain the skills the trainee needs to master the next one. The excessive number of pupils in the learning workshop does not cause problems or overtax the teacher. It is also impossible for an apprentice to have been working for several years in the workshop without knowing how to drill or gouge something, despite having come into contact with file and chisel.’


УЧЕБНО-СЛЕСАРНАЯ МАСТЕРСКАЯ

ВИТРИНА 8.

КУРСЪ ПЕРВЫЙ.

Систематическаго обученія слесарному

искусству (*)

1. Очистка отлитаго чугуна.
2. Вырубка изъ котельнаго желѣза фигуръ простыхъ формъ.
3. Вырубка изъ котельнаго желѣза фигуръ сложныхъ формъ.
4. Обрубка прямой поверхности.
5. Обрубка выпуклой кривой поверхности.
6. Обрубка вогнутой кривой поверхности.
7. Опиливаніе тонкихъ кромокъ желѣза по начертательнымъ чертамъ.
8. Опиливаніе прямой поверхности.
9. Опиливаніе 2-хъ прямыхъ параллельныхъ поверхностей.
10. Опиливаніе двухъ поверхностей составляющихъ прямой уголъ.

(*) Учебное время 210 часовъ.

Übungen mit übungsbezogenen Unterweisungen und Kenntnisprüfungen für die berufliche Bildung

ELEMENTAR-LEHRGANG METALL

AUSBILDUNGSABSCHNITT I

Herausgegeben vom Bundesinstitut für Berufsbildungsforschung Berlin

1973

GEMEINSCHAFTSVERLAG:
BEUTH-VERTRIEB · BERLIN · KÖLN · FRANKFURT (M)
GEBRÜDER JÄNECKE VERLAG · HANNOVER

Two dates, one didactic idea. In 1868 the Director of the Moscow Imperial Technical School, Victor Karlowich Della-Vos, inventor of the ‘sequential method’, uttered these remarkable sentiments. In 1873 this learning model was presented at the World Exhibition in Vienna and soon spread among Europe’s training centres. A century later, in 1973, the German Federal Institute for Vocational Training launched its first elementary metal training course, which was structured exactly along the lines of this pattern. In 2003, 130 years after this essay was written, several hundred courses across Europe evidently adhere to the principles expounded in 1868.

([61]) A training course based on an instructional step-by-step training manual.

10.1. The rise of industry specific training

For reasons of optimal capital exploitation alone, 'big industry' emerging at the end of the 19th century had to address the key issue of how to recruit skilled workers for its production plants and to train them to meet industrial requirements. This involved attracting workers from craft trades and agricultural enterprises who no longer made the grade because of their technological, organisational and social deficits. It called for a training strategy which used relevant organisational and didactic models to resolve the contradiction between traditional, contextual and situation-based learning and the systematic operations needed for mass production of high-quality industrial goods (Greinert, 1999).

Industrial production systems – mastery of technology and work organisation – called for a type of skilled worker which the labour market could not supply. They required a 'worker elite', a cadre of the old school with inter-occupational qualifications, extremely versatile and permanently willing to adapt to new demands.

We can formulate the following learning goals for 'the leading industry', heavy engineering and locomotive building at the turn of the 20th century (Schwarze, 1918). Skilled workers had to be able to:

(a) manufacture high-quality items such as machinery, equipment and tools with hitherto-unheard-of precision for serial production of interchangeable parts, and help develop new models and prototypes; the learning goal is vocational competence;

(b) control complex production processes for standardised and normed mass goods as machine operators, fitters, foremen or master craftsmen in a senior position and help maintain and repair machinery; the learning goal is process competence;

(c) accept the socioeconomic rationale of the production department and the company through their work practices and loyal conduct and make a significant contribution to reducing labour costs through quality awareness and frugality; the learning goal is social competence (Wiemann, 2002a).

These learning goals, which were set for Germany, mirror the standard learning objectives of Europe's other industrialised nations.

Modernisation of vocational training in industry generated two major developments in the organisation of learning which are still relevant today:

(a) stratification:

    (i) level one: foundation. School-based learning at a location away from normal operations for systematic acquisition of basic, practical vocational knowledge vital for a particular occupational sector (e.g. metalworking) under instruction from a full-time, trained educator.

(ii) level two: specialised vocational training. Situational learning for acquisition of practical knowledge at in-company workplaces in authentic production structures under the tutelage of part-time, company trainers.

(b) course-based training; to optimise learning efficiency, speed and measurement of achievement, practical knowledge from one discipline is divided into individual learning sequences which are structured into courses of increasing difficulty.

10.2. What a skilled worker has to learn

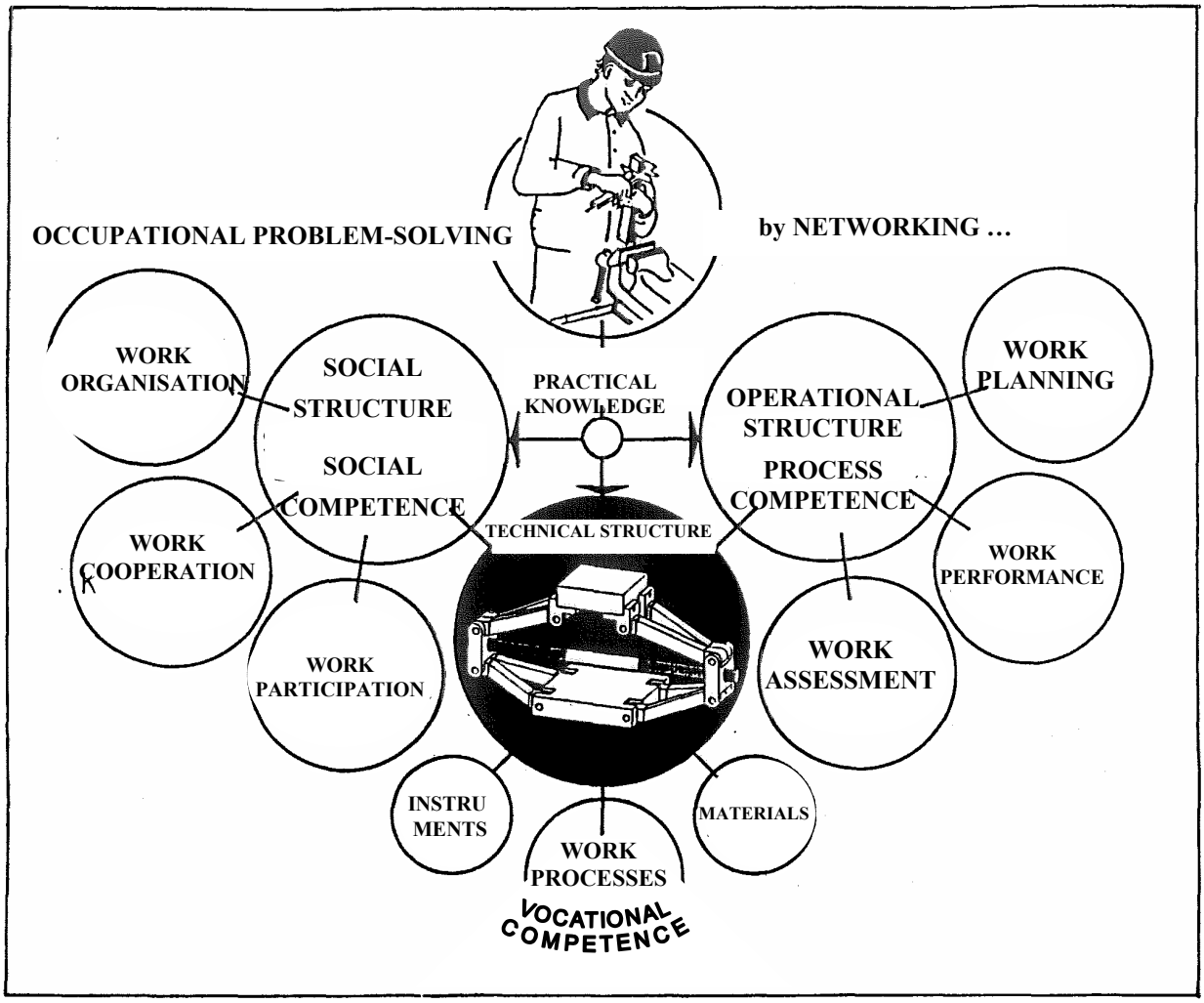
A skilled worker must exhibit exceptionally complex practical knowledge to perform a task after solving the problem it poses effectively (Figure 10.1). He/she must:

(a) master the technical structure of an occupational field (metalworking) and be able to link work procedures (e.g. turning) with the necessary aids (e.g. tools and machinery) and materials (e.g. sheet metal, structural steel); the learning goal is vocational competence;

(b) master the operational structure, be able to plan and execute the task in accordance with objectives and assess its performance and quality; the learning goal is process competence;

(c) know and master the social structure of the corporate environment and the work organisation and be able to help solve technological, organisational and interpersonal problems; the learning goal is social competence.

Figure 10.1: Conception of the practical knowledge a skilled worker typically requires to solve a complex task



In traditional operations, e.g. in craft trades, apprentices acquire vocational competences through imitative learning processes, by observing, attempting and copying while ways are found to fill entire customer orders. This approach has considerable advantages. It is rooted in practice and takes place under authentic working conditions. Apprentices learn to incorporate customer wishes at an early stage, to observe the market, to improvise and to work quickly and independently.

However, it also has grave disadvantages. High dependence on customer orders and company specialisation often makes training too *ad hoc*, incomplete and, of necessity, unsystematic.

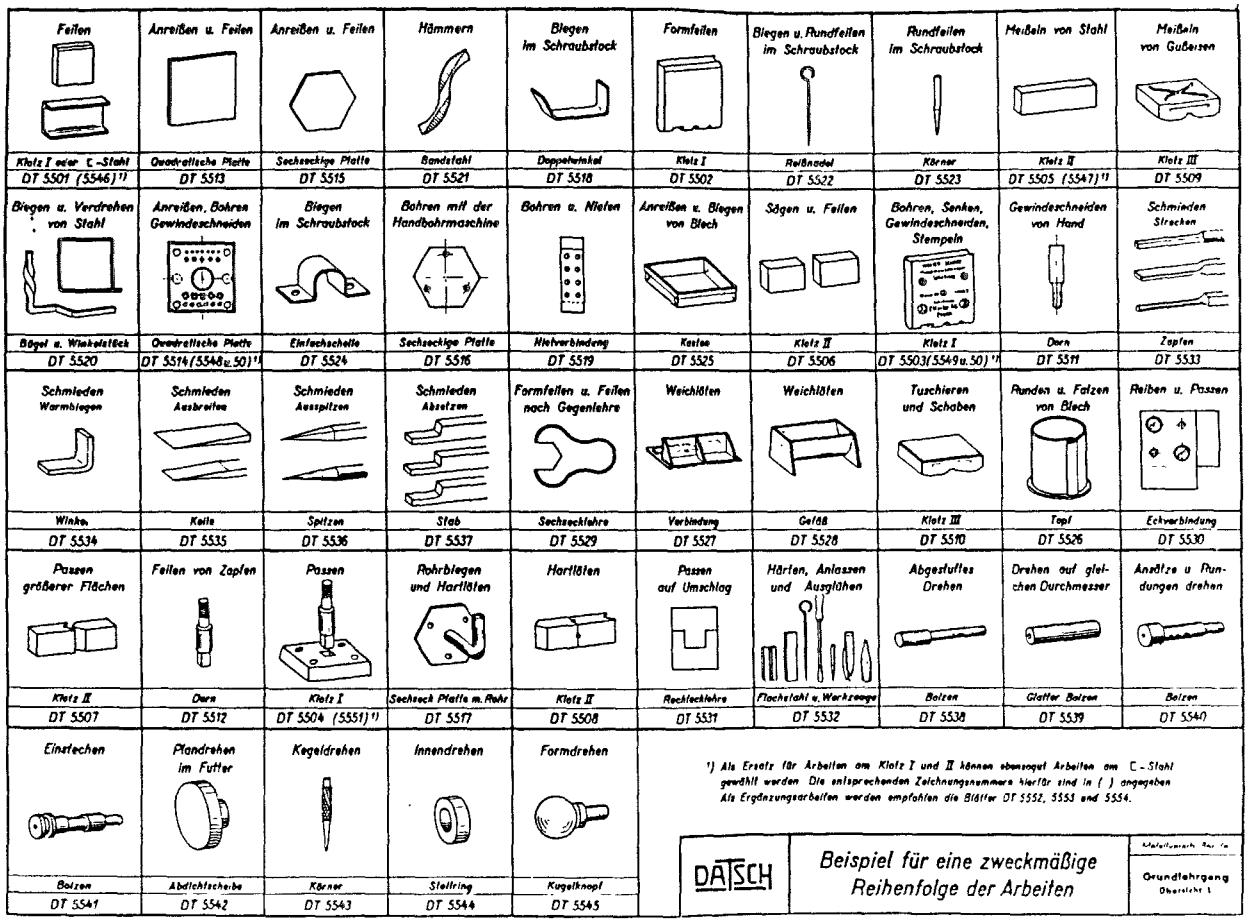
Industry at the turn of the 20th century had different expectations of future skilled workers. The new system required new directions in qualifying and socialising the next generation.

Figure 10.1 portrays the exceptional complexity of solving challenging tasks by application of a worker's practical knowledge. The structural principle is of 'carving' rationalised vocational learning. This complex technological and socioeconomic knowledge was broken down into

individual learning sequences and structured into courses of increasing difficulty (example in Figure 10.2). Apprentices now had to complete the entire course step by step, i.e. consecutively, in a linear fashion, under supervision, until they had a perfect command of the repertoire.

However, it did not merely involve direct mastery of skills. The sequential, taylorised learning scheme also contained a 'secret curriculum', employing a didactic combination of qualification and socialisation to prepare young apprentices swiftly for the socio-psychological hardships of modern industrial jobs.

*Figure 10.2: Basic course in metals (*Deutscher Ausschuss für Technisches Schulwesen, *German Committee for Technical Education, 1936)*



NB: This course clearly shows the fundamental principle of sequentialisation, with a linear structure of workpieces (e.g. channel section = filing; spherical button = forming by turning), organised in ascending order of the difficulty they pose to the acquisition of practical knowledge, objectively and in line with learning psychology.

The status of 'sequentialisation of working knowledge' in vocational didactics becomes clearer when we consider the history of occupational learning. Its structure remained stable for centuries until this approach ushered in a new era.

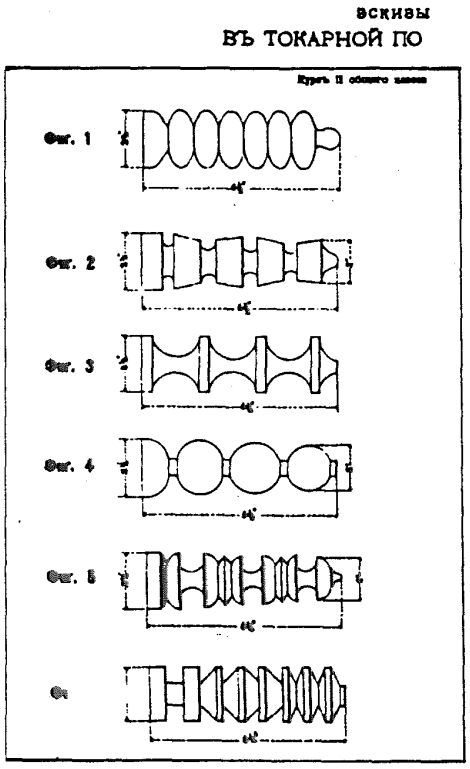
The following focuses on this 'nucleus of modernisation'. Its full significance only became evident, after unusual transfer processes spread it throughout the entire industrialised world.

10.3. Russian origins

Such a fundamental didactic shift from imitative to sequential vocational learning raises the question of how the original decision came about. Whose idea was this, and what motives prompted the initiator? After years of lengthy ideological and scientific debate, Ploghaus appears to have found a plausible answer to this question (Ploghaus, 2003). Della-Vos, Director of the Moscow Imperial Technical School, drafted the rudiments of this idea in 1868, when he decided to introduce a compulsory work placement for his engineering students to compensate for their lack of practical experience before starting studies (Figures 10.4 and 10.5). Students had to complete six sequential courses in wood-turning, model carpentry, forging, metal-turning, mechanics and mould-making. Course sequences were based on job and task analyses from various occupational fields. This form of vocational learning gained international renown at the 1873 World Exhibition in Vienna under the name 'Russian system'.

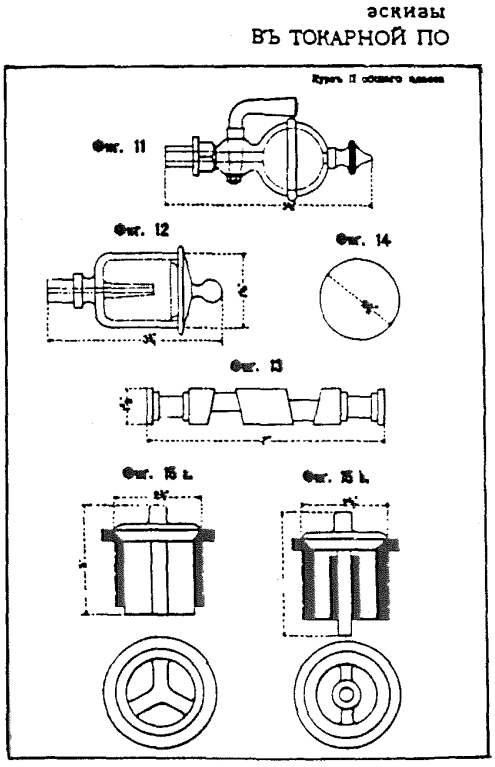
Figure 10.3: Victor Karlowich Della-Vos (1829-1890)

Figure 10.4: Wood-turning course



Source: Moscow Imperial Technical School; KRATKU OTCED technical drawing, 1892

Figure 10.5: Turning Course



Source: Moscow Imperial Technical School; KRATKU OTCED technical drawing, 1892

The courses in the metal field have dictated the structure of all curricular advances (also for other technical disciplines). They were constructed to meet three learning goals:

(a) vocational competence:

  (i) sequentialisation of reshaping knowledge: knowledge of resistance, such as filing, sawing, thread cutting, drilling, turning, etc.;

  (ii) complexification of construction knowledge: knowledge of joining, such as riveting, screwing, pinning, gluing, soldering, welding, etc, for stationary and moving systems.

(b) process competence

  (i) sequentialisation of planning knowledge:

    - knowledge of symbolisation, such as sketching, drawing, calculating, measuring, etc.;

    - knowledge of quality, such as form and measurement accuracy, surface quality, function testing by measurement and assessment, tracing and punching, etc.

  (ii) complexification of practical knowledge: knowledge of integration, recognition of connections: knowledge of planning, resistance, construction, symbolisation and quality.

(c) social competence:

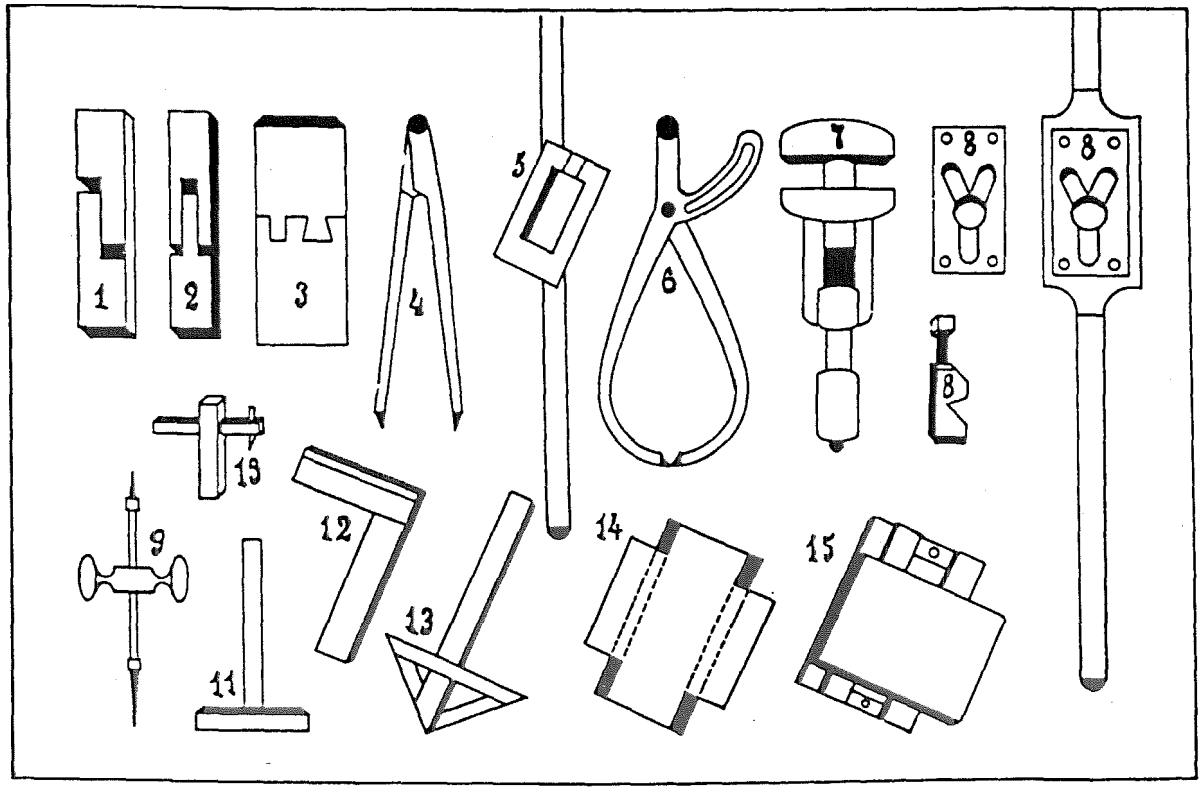
  (i) sequentialisation of social behaviour:

    - learning orderliness by practising cleanliness, economising, obedience, etc.;

    - learning responsibility by practising precision, self-control and self-assessment to produce high-quality work.

  (ii) consolidation of overall knowledge: learning relationships between operating functions and procedures.

Figure 10.6: Foundation metal course (Italy, 1900)



Source: Curti, 1992

The original selection of work tasks, e.g. for the first courses in Russia (Figures 10.4 and 10.5), had only to serve as exercises. Apprentices often found them pointless, and for this reason many educators criticised them sharply. In many cases this led to purpose-oriented, usable work pieces.

Course units can be divided into:

(a) work tasks without apparent relevance, i.e. lacking economic and motivational value, practice-based work tasks:

  (i) simple work tasks, such as completing die, channel section, drilling plate (Figure 10.13);

  (ii) complex work tasks, such as making rivet and screw connections;

(b) directly relevant work tasks, i.e. with economic and motivational value, functional work tasks;

  (i) simple functional tasks, involving tools such as hammer, square, pair of compasses, callipers (Figure 10.6);

  (ii) complex functional tasks, with tools such as coping saw (Figure 10.9), vices (Figures 10.7 and 10.11).

Figure 10.7: P. N. Subenko: Working diagram of assembly and clamping tools (Moscow Technical University 1991)

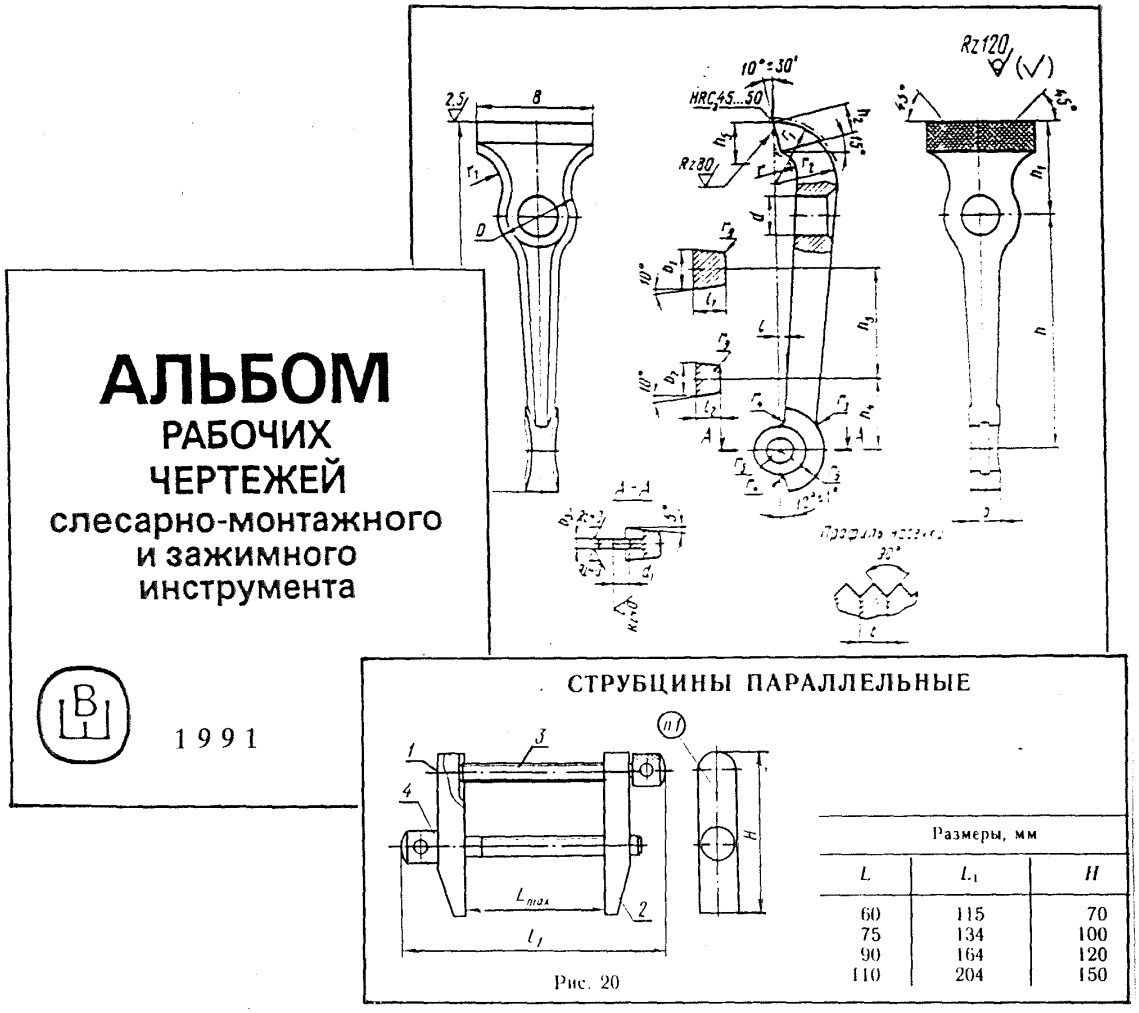


Figure 10.8: Technical drawings from metalworking courses – example: Swenden 1902

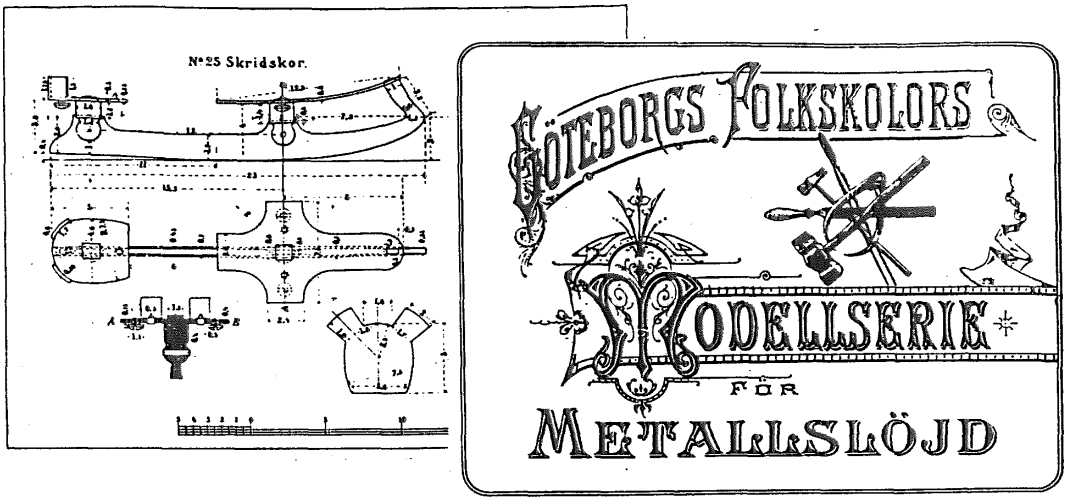


Figure 10.9: Technical drawings from metalworking courses – example: Finland 1958

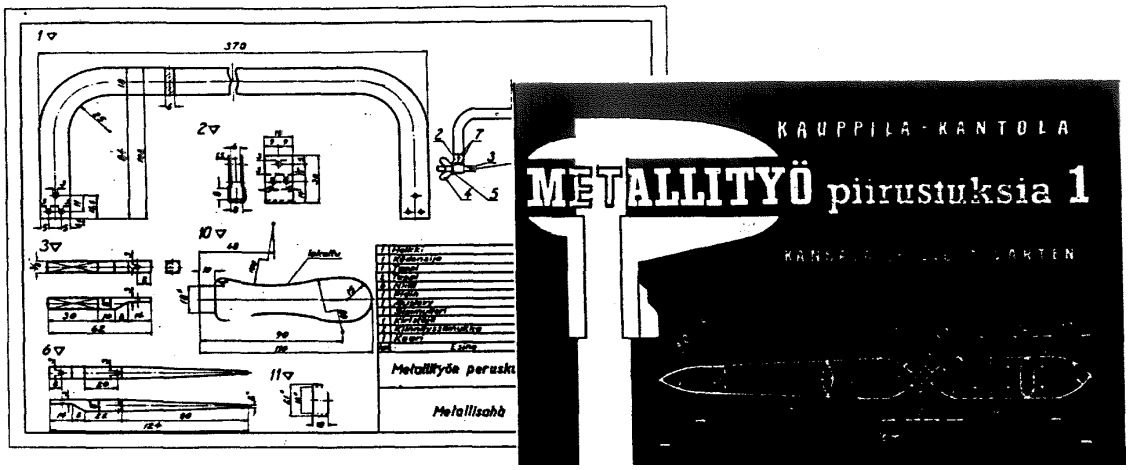


Figure 10.10: Technical drawings from metalworking courses – example: Israel 1987

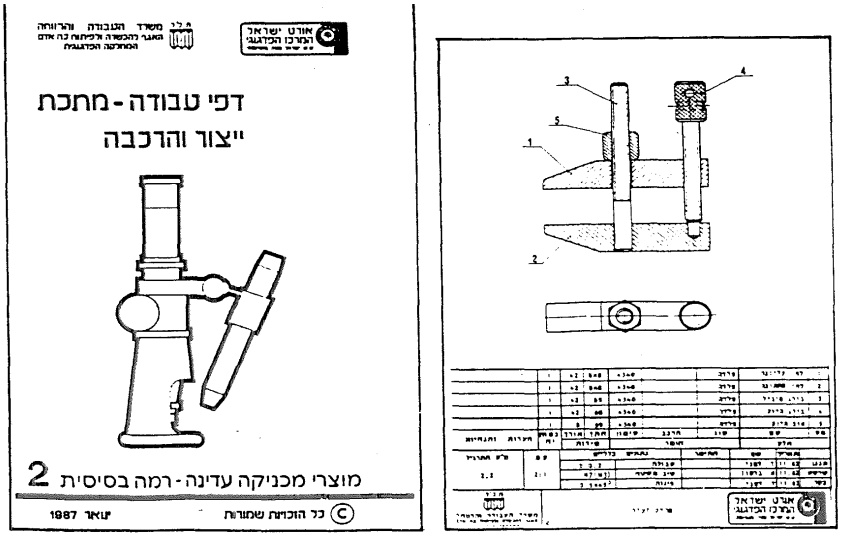
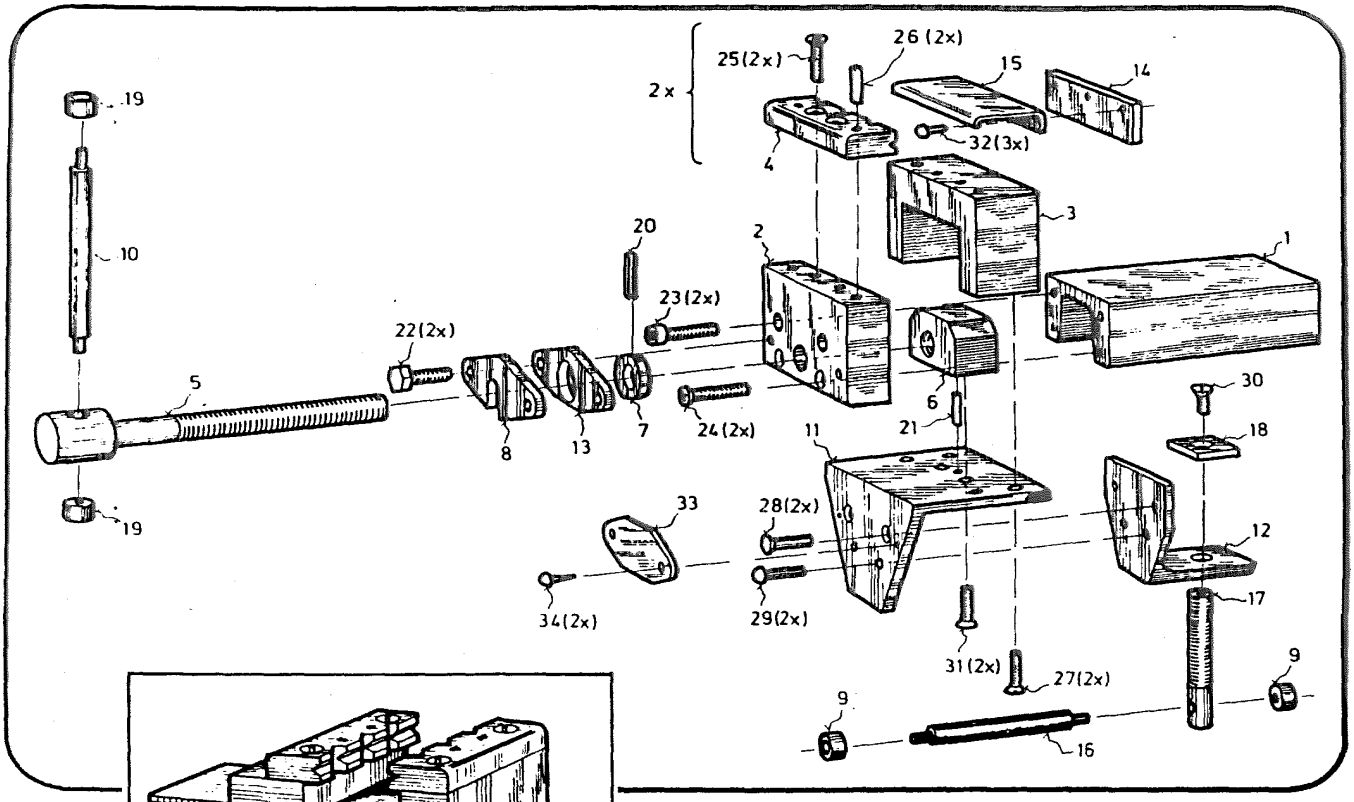
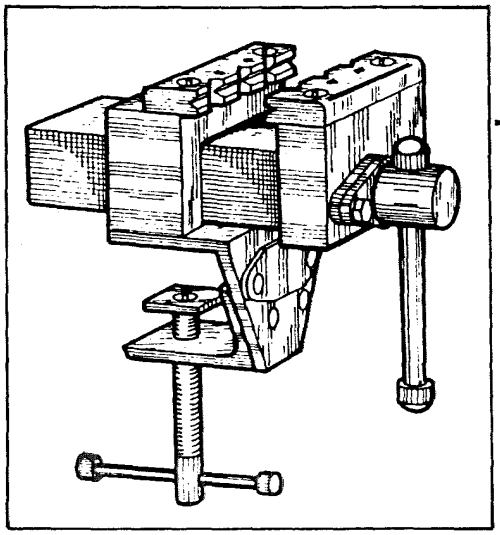


Figure 10.11: Institute for Research on Qualification and Training of the Austrian Employers Association (IBW), Vienna 1985





10.4. Transfer in Germany and in Europe

The educational principle of reducing didactic problems by sequentialising complex practical knowledge established itself as the Russian System. Following its unveiling at the 1873 World Exhibition in Vienna, the first transfer phase took it to Austria-Hungary (Komotau, 1874), Prussia (Iserlohn, 1879), England (London 1880-82) and the US (Boston 1876) (Ploghaus, 1984).

A second transfer phase at the turn of the 20th century is evident. Courses in metalworking and electrical engineering appear in the state rail system and in major enterprises, e.g. Schuckert (Nuremberg 1890), MAN (Augsburg 1892), Borsig (Berlin 1898), Krupp (Essen 1899), Siemens and Schuckert (Berlin 1903), Siemens and Halske (Berlin 1908), Voith (Heidenheim 1910), Loewe (Berlin 1912), Bosch (Stuttgart 1913), AEG (Berlin 1915).

Founding of the *Deutschen Ausschuß für Technisches Schulwesen* (German Committee for Technical Education, DATSCH) by the Association of German Mechanical Engineers, the *Verein Deutscher Maschinenbau-Anstalten* (Association of German Engineering Institutions) and a number of other societies marks a third transfer phase (Berlin 1908). Initially the committee focused on vocational training standardisation issues but soon became involved in designing courses. The first training course for apprentice mechanics, which was based on the 1916 AEG course, was introduced in 1919.

This course comprised a folder with drawings, a handbook for trainers, a printed curriculum, printed explanatory notes and large-format charts showing ‘right and wrong’. It literally wrote VET history. All subsequent courses organised by the *Deutsche Arbeitsfront* (German Labour Front), the Deutsche *Luftfahrtindustrie* (German Aviation Industry), the *Reichsinstitut für Berufsausbildung* in Handel und Gewerbe (Reich Institute for Vocational Training in Trade and Commerce, which evolved from the *Deutsche Ausschuss für das technische Schulwesen* [German Committee for Technical Education] in 1939), the *Arbeitsstelle für Betriebliche Berufsausbildung* (Centre for In-Company Vocational Training) in the post war period, and the Federal Institute for Vocational Training bore its hallmarks. GDR training courses issued by the *Deutsches Zentralinstitut für Berufsausbildung* (German Central Vocational Training Institute) were also highly indebted to it. The basic concept has also been embraced by courses in other occupational fields such as house carpenter, skilled concrete worker, joiner, etc.

The European processes of course transfer – based on the Russian System – have not yet been investigated systematically. Around 130 metalworking training curricula from around the world (approximately two thirds from Europe, Figure 10.12) were compiled by the Troika research project, to analyse and interpret the transfer processes. The project will concentrate on the motives and pressures which triggered such remarkable propagation in Europe and inspired a comparable trend in the vocational training of so-called developing countries after 1945.

Figure 10.12: Transfer of the Russian system to western Europe: metalworking training courses analysed to date

Germany excluding GDR (from 1894 approx. 60 courses)
German Democratic Republic (1951, 1952, 1953, 1959)
England (1903, 1966, 1967, 1967)
Finland (1903, 1957, 1958, 1958, 1986)
Italy (1875, 1881, 1883, 1889)
The Netherlands (1975)
Austria (1932, 1983, 1986)
Poland (1987)
Russia (1892, 1984, 1991)
Sweden (1902, 1967, 1971, 1973. 1982)
Switzerland (1963, 1970, 1973, 1990)
Spain (1984)
Hungary (1979, 1981)
Israel (1987)
Turkey (1993)
Requested: Bulgaria, Lithuania, Romania

Source: Wiemann, 2002b

We could maintain that European experts chiefly encountered the Russian System at trade fairs, exhibitions and congresses (take the example of the 1873 World Exhibition in Vienna). Its presentation and functionality would have been convincing despite language barriers. We often hear the statement, 'Vocational trainers are the best plagiarists!' This could be one explanation for this proliferation. Course translations could also have been instrumental. For

example, German courses were translated into Spanish, English, French, Portuguese, Arabic, Chinese, Japanese, Korean, Persian and Thai. However, we must dig deeper to find a plausible explanation for the transfers.

The reason for the swift and global dissemination of the training course concept might have been the 'symbiosis of function and interests':

(a) didactic symbiosis; didactic acceptance stems from the course's truly inspired pedagogical construction, the symbiosis of training and socialisation, the systematic and monitored acquisition of industrial practical knowledge and the inculcation of psychosocial behaviour which complies exactly with the demands of the production system;

(b) Socio-political symbiosis; socio-political acceptance stems from the fundamental harmony of the company's interest in gaining competent skilled workers through this form of training with apprentices' interest in improving their job opportunities and social status;

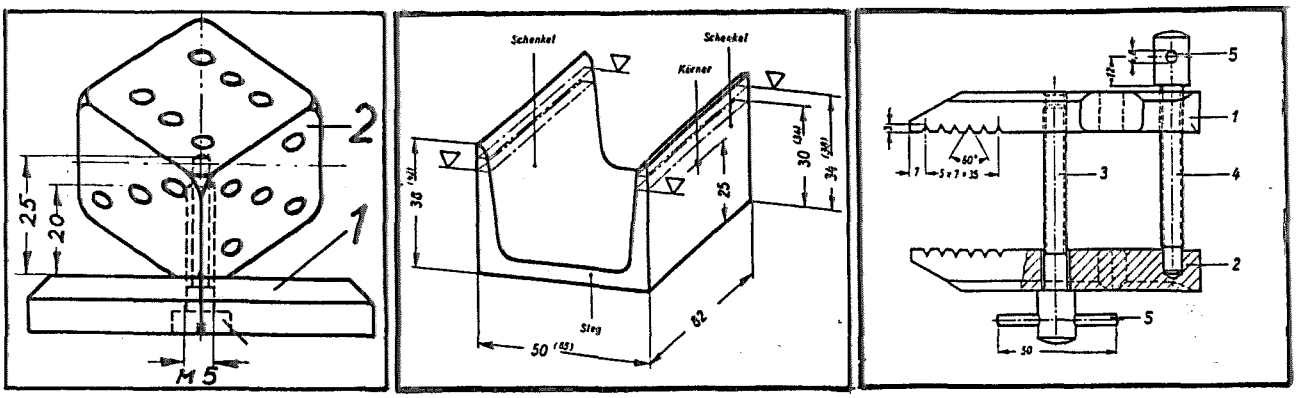
(c) Practical symbiosis; practical acceptance stems from the course's unusual simplicity. Training personnel can handle the prepared course material confidently and fairly easily (without lengthy preparatory study). Apprentices perceive the course as a transparent learning programme which will lead reliably to the desired outcome.

10.5. Key fossils

Continued advances in analysis and comparison will enable us to make more precise statements on the motives and pressures behind the introduction of courses into the structure of the relevant vocational training system. However, we can comment more knowledgeably on the sources which the various course users have exploited. Methodologically, we can search for 'key didactic fossils' which can provide information on course origins (Wiemann, 2002b).

'Key fossils' are work tasks which courses for mechanical engineers, turners, millers, plumbers, smiths, etc. have employed regularly since their infancy. Typical examples include functional tasks such as low angle, compasses, prick punch, plumb line and coping saw, and practice tasks such as die, channel section and parallel clamp (Figures 10.13 and 10.14).

Figure 10.13: Original, typical 'key didactic fossils' in metalworking courses



Source: Wiemann, 2002b

'Die' work task, first featured in the Moscow Imperial Technical School course (1873) and *Königlich-Preussischen Eisenbahnverwaltung* (Royal Prussian Rail Administration) teaching workshops (1878).

'Channel section' work task, first featured in the Deutsche *Mechanikerschule* (German Technical School) filing course in *Glashütte* (1926), didactically validated in courses of the *Staatliche Fachschule für Kleineisen - und Stahlindustrie* (State Institute for the Ironmongery and Steel Industry) *Schmalkalden* (around 1930).

'Parallel clamp' work task, first featured in courses of the *Allgemeinen Elektricitäts Gesellschaft*, AEG Berlin (1916).

Figure 10.14: 'Key didactic fossil'; statistics

Didaktische Leitfossilien
„Grundlehrgang Metalltechnik"
- Übungsförmige Arbeitsaufgaben -

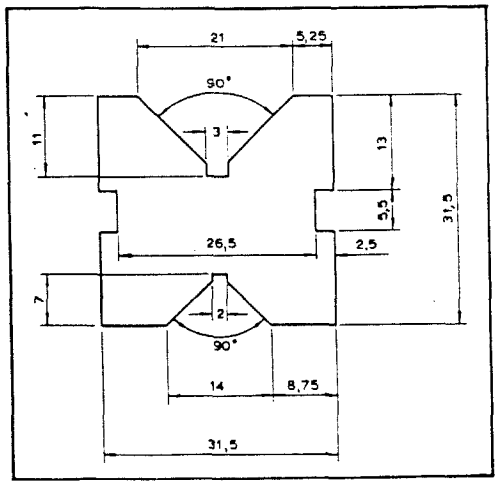
Leitfossilien Deutschland	Würfel	12
	U-Profil	42
Leitfossilien Ausland	Würfel	2
	U-Profil	19

Didaktische Leitfossilien
„Grundlehrgang Metalltechnik"
- Funktionsförmige Arbeitsaufgaben -

Leitfossilien Deutschland	Würfel	11
	U-Profil	33
	Parallelzwinge	26
Leitfossilien Ausland	Würfel	1
	U-Profil	13
	Parallelzwinge	21
Übersetzungen in Fremdsprachen		11
Identifizierte Leitfossilien – Gesamt:		191

Source: Wiemann., 2002b

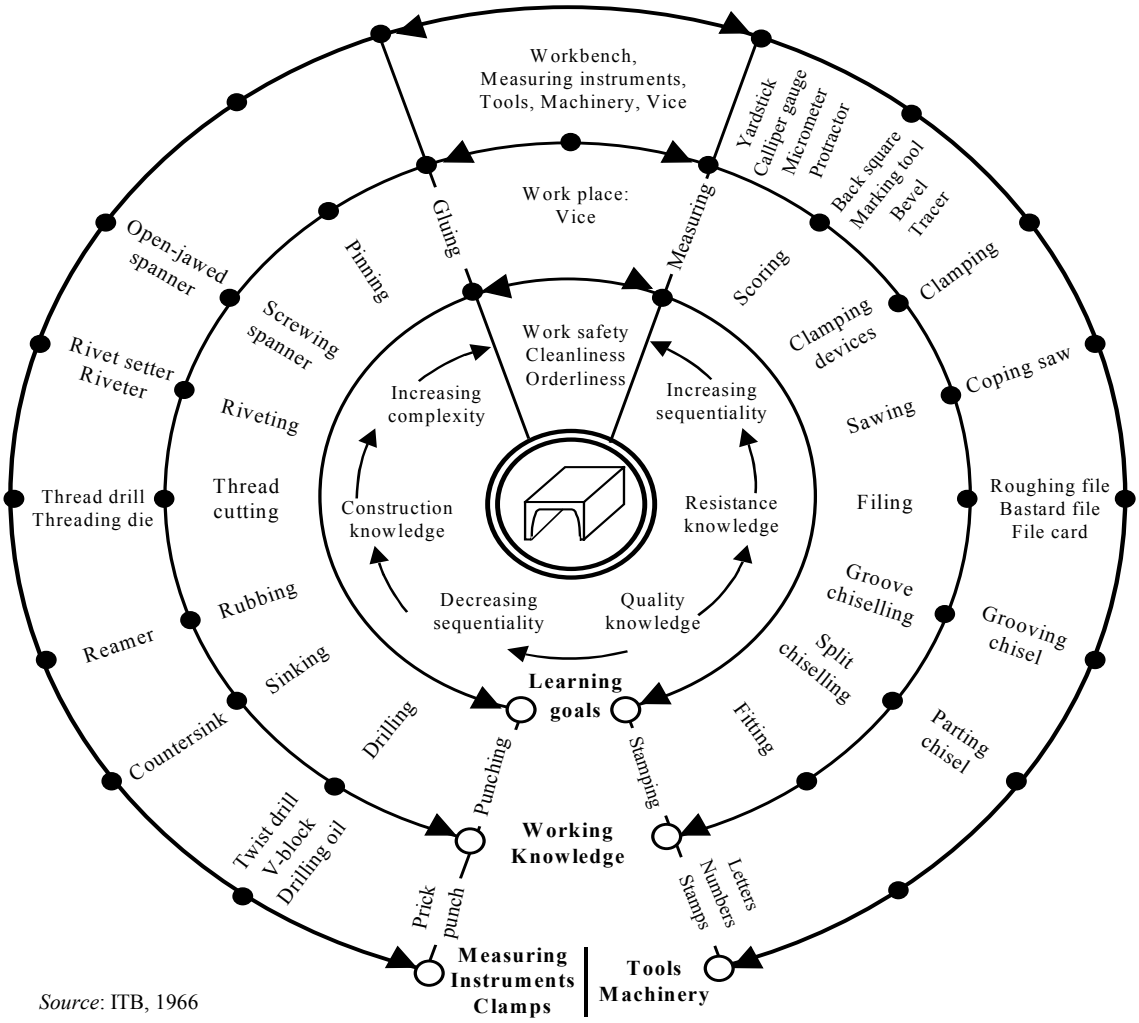
Figure 10.15: Didactic Key Fossil example: V-block (London 1966), milling course, training with machine tools (to date we have found 28 instances)



Source: Wiemann, 2002b

The statistical overview shows constant recycling of work tasks from previous courses. This no doubt stems from the reliability of these tasks rather than the instructors' lack of imagination, as is often claimed. Study of more recent courses reveals the 'die' (e.g. in Switzerland), the 'channel section' (e.g. in the People's Republic of China) and inclusion in project-based work tasks (e.g. in Austria, Figure 10.11).

Figure 10.16: Universal practice task – channel section



Source: ITB, 1966

10.6. Conclusion

The idea of structuring vocational learning into courses strictly follows the work ethic of modern industry: achieving optimal productivity with the lowest possible human, organisational and technological investment. The 'Universal practice task, channel section' example shows the radical transfer of this concept to sequentialised vocational training (Figure 10.16). The basic metalworking learning goals – resistance, quality and construction knowledge (time economy) – are linked to the rigid demands of work discipline and endurance (socioeconomy) by means of a single object (material economy), a channel section.

The socio-genesis of industrialisation has been portrayed and analysed historiographically in fair detail: the Industrial Revolution in England, its transfer to France, Germany and the rest of mainland Europe, and its subsequent leap to North and South America, Japan and, after the Second World War, to numerous southern hemisphere countries. Natural as this development may now seem, the various national training concepts for the masses of industrial workers differ drastically, considering that they originate from the same technological trajectory (Greinert, 1999).

However, this strict observation only applies to the system level of the vocational training order. The lower, operational, direct training level, in contrast, has produced relatively standardised, 'typically industrial' learning concepts. The 'course', with its sequential learning organisation, must be regarded as a prototype for this development. The birth of the training course concept reflects both the modernisation history of industrial nations and the history of European cultural exchange.

Undoubtedly, the 'training course' is the most successful and effective learning system in the short history of industrial vocational training. Its didactic concept has merited an unprecedented dissemination across all European industrial societies. One does not need to be a prophet to predict that we will continue to work with the 'sequentialisation as problem reduction' learning structure in the next 130 years. It is impossible to create a fundamental repertoire for an area of specialisation faster and more reliably. Modern courses in hydraulics, pneumatics, electronics, CNC technology and EDP demonstrate how crucial this learning system is.

The dominance of the Russian System in vocational training is waning. Current production conditions now demand open qualifications which are increasingly provided by teaching learning in context (Figure 10.11) and self-guided problem-solving in projects and *Juniorfirmen* (practice firms). These innovations are urgently needed, since the internal structure of courses often engenders discipline (Kipp, 1995) with the aim of subordinating apprentice interests to those of the state and the economy. The European legacy of vocational education – sequentialisation and consolidation – still requires historical analysis of its evolution and transfer. This is a task for Cedefop, too. For 130 years, millions of young people have set out on their career paths with the laborious 'training-course apprenticeship' and have thus made a considerable contribution to the quality of European industrial products.

Notes

Vocational Training Act (BBiG): the regulations for vocational training in industry were compiled jointly by the associations over a considerable period. These regulations were codified in a federal law in 1969 after drawn-out political debate.

German Society for Technical Cooperation (GTZ): this organisation is a federal government agency to promote international development policy. It has demonstrated competence and commitment to vocational training since the Second World War. GTZ experts have helped transfer the training course system to countries on the threshold of industrial development. This proved that smooth transfer to different social, linguistic and cultural conditions was possible.

Troika: this term denotes the cooperation of German and Russian universities in a planned in-depth study on the transfer processes of the training course system in Europe more closely.

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11. Three hundred years of vocational education in Russia

Irina Stanislawowna Derivianko

The 300th anniversary of vocational education in Russia fell on 14 January 2001, as it was on 14 January 1701 that the first school of mathematics and navigation was opened in Moscow by decree of Peter the Great, the Russian tsar and reformer. Here is a very brief explanation of the economic situation in Russia during this period.

The country was an agrarian state and the basis of the economy was agriculture, using peasant manual labour. On succession to the throne, the 17-year old Peter I, who was to introduce extensive reforms in Russia in the future, dreamed of an industrial power with a strong navy. To realise the plans of the Russian Emperor, specialists such as engineers and workers were required, but these were resources that Russia did not have. Turning his attention to the Europe of the Enlightenment, Peter I and his Grand Embassy travelled abroad in 1697. His principal aim was to find countries in Western Europe to be allies in the struggle against Turkey, at the same time the Grand Embassy assembled academics and industrial experts to work in Russia. Many of the members of the Grand Embassy underwent training in various professions. Peter I himself studied navigation theory abroad as well as mathematics and geometry, and also gained work experience as a carpenter in shipyards in Zaandam, previously Saardam, where there is still a museum dedicated to the tsar and carpenter. The Russian Emperor mastered 14 trades including ships, navigation, mathematics and astronomy and even medicine.

After his travels and studies abroad, the Tsar returned to Russia in 1698 and began to reform the Russian State. The foundations were laid for a system for training engineers and specialist workers, the mining and metallurgical industry was launched in the country and the naval fleet was built, which Russia used to expand and strengthen its sea borders.

Schools were opened which marked the start of vocational education, including schools of navigation, artillery, engineering and medicine. In addition, schools concerned with training highly qualified engineers, shipwrights and technicians, mining and metallurgical specialist workers were also created.

A school for general education was opened in Moscow, headed by the well-known Marienburg pastor of Saxon origin, Gluck, an enthusiastic pedagogue and missionary who had received a good philological and theological education at German universities.

Peter I practically had to force the issue of education in Russia; there was virtually no one interested in studying. Parents did not want to send their children to be educated; in fact they took every possible means to prevent it. Discipline in newly-opened educational institutions

was very harsh. Fines were imposed for truancy and corporal punishment was used. Peter I was forced to issue a decree to the effect that those not having a relevant certificate of education were prohibited from marrying. This, in turn, had the consequence that unmarried men did not have inheritance rights.

Of course, without the aid of his comrades-in-arms (aides), the Tsar and reformer would not have been able to do what was necessary to enable Russia to be transformed over a very short period of time from an agrarian country into an industrial state, one of the leading states in Europe. The origin of a person, or his nationality, was of little significance to the Tsar. The most important factors were the quality of his work and his desire to work for the good of the fatherland. Peter I's closest comrades-in-arms should be mentioned here.

Aleksandr Menshikov, Feodan Prokopovich, Andrei Nartov, Demidovi were from the lowest levels of society. The nobleman Vasilii Tatishchev, the Scotsman James Bruce, the Dutchman Williams Genin and many other of the tsar's comrades-in-arms were reformers who left an important mark in the history of the development of the Russian State and, in particular, in the history of vocational education.

If, at the beginning of Peter I's reign, reforms were not precisely planned, by the 1720s specific prospects for the development of Russia began to take shape. However, the sudden death of the Tsar suspended the progress of development, including in the system of vocational education, for a long time.

From 1762 reform progress continued, in particular in education. This occurred after the overthrow of the reigning monarch and succession to the throne of Empress Catherine II, formerly Sofia Frederika Augusta of Anhalt-Zerbst, a German by origin, who became known as Yekaterina Alekseevna after she was baptised into the Orthodox Church.

In the first half of the 18th century, the system of schools for general education was not widespread. Catherine II put the slogan 'man and citizen' on the banners of education in place of the motto 'craftsman', which was characteristic of the era of Peter the Great. Under Catherine, the aim of newly established educational institutions was to provide a general education. She set herself the task of creating a wealthy, lawful and educated country, achieving a great deal both for Russia and for the history of the development of vocational education. Under Catherine II, schools for the different social classes were opened in which children studied according to their background. Graded education was introduced and educational institutions continued to be opened for training specialist workers.

In the periods of educational development under Peter the Great and Catherine II, there was radical reform in the very approach to vocational education with even the ruling class realising that education was necessary for a State to flourish.

The problems of educating and training the Russian people fell to Catherine and her closest aides. Among them was Ivan Betskoi, the illegitimate son of Prince Trubetskii, born in Sweden. Until he was 20 he lived abroad and gained a brilliant education at universities in

Åbo and Leipzig and, on arriving in Russia, entered the circle of the Empress' trusted companions. Policy as regards education was put into practice by creating the Academy of Arts, the Smolny Institute, nine educational orphanages, and by opening a number of specialist primary institutions. There were also some unrealisable ideas: in particular, Catherine II and her aides wanted to foster a 'new breed of people'. This was a utopian idea mainly derived from the fact that Betskoi thought that the imperfect society in which people lived prevented them from developing into highly moral people and so it was necessary for children to be educated in isolation from surrounding society. They created a specialist school where children lived, were educated and learned a profession away from their parents, using methods which supposedly assisted in fostering a new breed of people.

It is also necessary to say something of the first woman in Russia (apart from women succeeding to the throne) to occupy a State post: Yekaterina Romanovna Dashkova. She said: 'Education leads to liberty, liberty without education would give rise only to anarchy and unrest'. For a long time Dashkova lived abroad and had the reputation of being the most educated woman of her time in the 18th century. Academics lauded her love for education. Frederick the Great himself favoured her with conversation. Catherine II appointed her director of the Academy of Sciences and Chairperson of the Russian Academy. This is how her guest from Ireland, Catherine Wilmot, described her: '[...] she teaches bricklayers how to build walls, helps to make yeast, goes out to feed cows, writes music, writes articles for publication, knows everything about theatre. She is a doctor, a pharmacist, a doctor's assistant, a blacksmith, a carpenter, a judge, a lawyer [...]'. (*The Russian journals* ..., 1971)

In the 1870s and 1880s there was a technical revolution in the main branches of industry. The country's economy took a capitalist slant and the number of industrial workers increased. The need for workers to have specialist training became more appreciable. All of these objective processes brought about the need not only to increase the number of specialist educational institutions, but also to create a system specifically for vocational education.

By the middle of the 19th century there was a rapid growth in industry in Russia. In 1866, the Russian Technical Society was founded. The statutes of this society were approved by the Emperor. The founders of the society had the intention of carrying out public lectures on technical subjects, assisting in making technical education more widespread, in setting up exhibitions at manufacturing and factory buildings, building technical libraries, chemical laboratories and specialist museums.

One of the departments of this society was entirely responsible for managing primary vocational education and assisted in opening specialist educational institutions for training master craftsmen and workers in Russia. Yevgenii Andreev was the first chairman of this society. In 1874, the society was awarded the honourable title of the 'Imperial' society.

The Imperial Russian Technical Society developed the principles of specialist education; it also created a number of awards for technical and vocational education and mobilised public support for maintaining existing and opening new specialist educational institutions.

The vocational education institutions in pre-revolutionary Russia combined theoretical and practical training in different ways. Secondary specialist educational institutions training technical managers, production managers, specialists in these or other sectors of industry, agriculture and transport at the end of the 19th to the beginning of the 20th century, offered their graduates a very adequate theoretical training. The majority of the elementary vocational educational institutions offered very limited theoretical training or did not give any at all, being limited to only training in the trade for its students.

So it was from 1701, when Peter I opened the first vocational school, to 1917, that higher, secondary and elementary vocational education was established in Russia. In November 1917, the Bolsheviks came to power. Their slogans promised the world for ordinary people, but in real life things turned out to be a lot more difficult. As in the famous *Internationale* there are the words: '[...] the earth shall rise on new foundations [...]'.

They really did destroy the old world. There were thousands of homeless children sleeping rough in the cities; a civil war broke out. It was under these conditions that a new stage in the development of Russia began. Vocational education was also destroyed. Before the revolution, the majority of the educational institutions were private. In these new conditions, the whole educational system was now subject to the People's Commissariat of Education and the education system was nationalised. In the first years of Soviet rule, the leader of the communist movement, V. I. Lenin personally prepared numerous decrees relating to vocational education. Under the authority of the government, special committees were set up to supervise issues relating to education and vocational and technical education. Numerous decrees were issued, such as the Decree on General Educational Obligations. By 1917, the country was more than 70 % illiterate and it is very difficult to learn a profession if you cannot read or write, let alone have a higher level of education.

In 1921, Lenin was forced to use private capital in Russia. The New Economic Policy was introduced, thanks to which work was begun on the refurbishment of factories and works and on opening new ones. And so it was at these factories and works that schools were founded for training specialist workers. These schools existed until the 1940s. They had the disadvantage of there being no unified system for training specialist workers as each plant trained specialists only for the purposes of their business.

In the 1930s, the country experienced rapid growth in industry and electrification and the country began to industrialise. Gigantic constructions were developed. All this required vast numbers of qualified workers. The government of the USSR (after 1936 Russia became known as the Union of Soviet Socialist Republics) found a way out of the situation that was developing. In the 1930s, the Central Institute of Labour was founded in the Soviet Union, run by enthusiast and lover of technology (he even dedicated poems to machines and mechanisms) Aleksei Kapitonovich Gastev. One of the first scheduled documents produced by the institute were the rules *How one should work*. It is of interest here that these rules are still relevant to work today.

By 1940 a problem had arisen which required an immediate solution, and this was to train qualified specialist workers. In 1940 the Decree on State Labour Reserves was issued by the government. In accordance with this decree, the government had the task of arranging the organised training for qualified workers consisting of young people from cities and towns and from the collective farms and of creating the necessary reserves of workers for industry. Trainees were provided with free State accommodation, clothing, food and social and cultural entertainment, entirely at State expense. Many prominent figures and well known personalities completed their education at Labour Reserves institutions in the 1940s, 1950s and 1960s and gained a vocational specialisation. For example, the first cosmonaut in the world, Y. A. Gagarin, graduated from a vocational educational institution.

By 1941, the issue of workers had begun to be resolved in a favourable manner but, during the Second World War, all institutions training specialist workers were placed on a war footing. Education gained an especially practical approach: young men and women replaced their fathers and their older comrades who had left for the front at their workbenches. After the war, the country began the restoration of the destroyed cities, towns and villages and again, workers were required as never before.

Thousands of primary vocational educational institutions were opened in the country, by order of the Government. The period of study was one and a half to three years. A very important decision was taken with regard to vocational education in 1968 when, in addition to vocational education, those studying at vocational and technical institutions were also given a full secondary education. Students completing their studies could go on and study further in higher education institutions which had a positive effect on the replenishment of the specialist workforce.

Separate mention should be made of the training system for workers in Leningrad. Vocational education, managed by the talented organiser Lvov Alekseevich Gorchakov, managed in a short period of time to solve the problem of training qualified workers for the city and the north-west region of Russia. In Saint Petersburg (at that time Leningrad), and later in other cities and towns in the Soviet Union as well, complexes were opened for training specialist workers. Each complex included newly constructed buildings in which the students lived, studied and relaxed, and these were all at the State's expense. These complexes were attached to core businesses. The businesses helped to educate the pupils. Each business with more than 8 000 staff was obliged to help finance the building and maintenance of the educational institution which would then train staff for the business.

Palaces of Youth were opened for the students where the boys and girls could play music, dance and do ballet. Great importance was also attached to physical education for the students. A sporting society, the 'Labour Reserves', was created which developed hundreds of well known sportsmen.

In order to increase the prestige of specialist workers in the 1970s, the 'tutorship' movement was created. Many Heroes of Socialist Labour – this was the highest award for civilian work – transferred to work as master craftsmen in educational institutions for training young workers.

It was by this means that in the 1960s, 1970s and 1980s the problem with workers was resolved.

In the 1990s, Perestroika brought about change in Russia again. The balance which had been attained through enormous effort was destroyed anew and the issue of training for specialist workers became acute; yet again the country was faced with the issue of how best to solve this problem.

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List of abbreviations

AEU	Amalgamated Enginering Union
BBiG	Vocational Training Act
BIBB	
CAP	*Certificat d'Aptitude Professionnelle*
CAYC	Clyde Apprentice and Youth Committee
Cedefop	European Centre for the Development of Vocational Training
CSEU	
EEF	Federated Scottish engineering firms
FEST	
GTZ	German Society for Technical Cooperation
ITBs	Engineering training boards
MA	Modern Apprenticeship
NWETEA	North West Engineering Trades Employers' Association
SEF	Shipbuilding Employers Federations
SME	Small and medium sized enterprises
VET	Vocational education and training

(the Engineering and the, respectively) and national trade unions and their federations (notably the and the / respectively).

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Towards a history of vocational education and training (VET) in Europe in a comparative perspective: Proceedings of the first international conference October 2002, Florence. Volume I. The rise of national VET systems in a comparative perspective

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