SKILL AND SCHOOL
Lower technical education and the Dutch Business system

1. The social embedment of skill

In every advanced society enterprises are confronted with the necessity to replace their older workers or to adapt their personnel to the changing skill requirements due to economic competition and technological changes. The vocational education of the young has been undertaken by employers, trade unions and the state, in specific constellations resulting in institutional arrangements that not only reflect national business systems, but also heavily contributed to their characteristics. The educational systems may, therefore, be characteristic of the business system of the country. The theoretical expectation is that skill formation will be a matter of concerted action in societal formations where employers, trade unions and the state have entered into some long-term cooperation: these parties will likely share tasks and responsibilities in defining the desired skills, in setting up training schemes and facilities, and in bearing the costs. Where this cooperation does not exist, these parties will try to monopolise skill formation according to their own short-term interests. These differences roughly conform the dichotomy between coordinated and liberal market economies, as postulated by Soskice and Hall in their study of national business systems.[1]

2. Skill formation in the UK, Germany, the USA and Japan

Before we set out to analyse the development in the Netherlands, it makes sense to consider two European countries where systems of skill formation were created much earlier: the United Kingdom and Germany, and to make a short comparison with two non-European countries where industrialisation was modelled upon European examples, however with very different ways of skill formation: the USA and Japan; we follow here the analysis of Kathleen Thelen.[2]

Skill formation in the United Kingdom: a private matter
The pivotal period in Great Britain was the first stage of the Industrial Revolution, when the government supported the rising class of entrepreneurs in their struggle against mercantilist regulations and especially against the guilds. The latter organisations used to control the entrance and training of the apprentices, but now individual employers exerted this control. Efforts of the trade-unions to take over this control led to bitter struggles, especially in metallurgy, that, as a rule, were lost by the latter. Only when small groups of workers (‘craft unions’) were able to dominate their part of the labour market, as in the printing industry or stevedoring, their unions kept control of their skills.[3] The employers, however, did not use their influence to set up an alternative and

common system of vocational training; instead, they trained their own workers on the spot, on an ad hoc basis. As a consequence, there was no system of certification and there were no institutionalized training schemes. They treated these young workers as cheap labour and did not invest too much in them: they might change employment after their training period –the famous free rider dilemma that prevented common arrangements. Ambitious young people had to make sure they got the competence they needed by their own initiatives, looking for experienced workers willing to give them some training or, in the case of the more well-to-do, by following courses in private schools.[4] To be sure, there was a period that an apprentice system operated, namely in the post-war years, but this was due to political circumstances (Labour governments in favour of such a system) and economic constraints (a shortage of skilled labour, that prevented post-war Conservative governments to change this system). The Conservative take-over in 1973 coincided with an economic downturn, and the apprentice system was then abruptly abolished.[5]

Skill formation in Germany: institutional embedment

The German system of skill formation also originated in the first years of its industrial revolution, in this country after 1870. The big difference, however, was the socio-political and economic context of the transformation: it was accomplished under strong supervision by an authoritative state that intervened frequently according to its political agenda. In order to neutralize the influence of the socialists, the government strengthened the grip of the voluntary guild-like organisations (*Innungen*) on the training of apprentices and journeymen: for instance, the non-members had also to contribute to the training costs. The 1897 *Handwerkschützgesetz* imposed a new, parallel structure of compulsory membership of industrial chambers which had the authority to prescribe the content and the quality of the vocational training schemes, to regulate the quantity of the apprentices admitted and, perhaps most important, to certify the diplomas.[6] The latter right was deeply resented by the big industries in the metallurgy: they wanted a more broadly applicable training under their own supervision; the competence to certify was only gained under the Nazi-regime.[7]

Despite the deeply conservative motives behind the creation of these chambers –they should protect the artisan skills against the degrading influences of industrialisation, and the traditional social order against socialism- the small but strongly market-oriented industrialists of Bavaria, Baden, Wurttemberg, Hessen and Thuringia succeeded in adjusting the training schemes to the needs of a competitive export market, avoiding a backward-looking conservation of the traditional skills, and this eventually led to a strong identification of the socialist leaders with this system, as nearly all of them had received their vocational training here. As a consequence, they put their hopes on reforming the system of these chambers, not on breaking them up and creating their own vocational

training schemes, in opposition to those of the employers, as was the case in the UK. Due to this policy, they even sided up with the big industrialists in the metallurgy sector. And more important, they were patient and able to discipline the more radical demands of the rank and file members; after the gloomy days of National Socialism they eventually attained their goals after 1953, with the realization of bipartite administration of the vocational training schemes. In 1969, under the SPD-CDU coalition, the system was given a national, tripartite character and became part of the *Bundesinstitut für Berufsbildungsforschung* (Federal Institute for Vocational Training Research).[8] The German system is still operative, due to some essential mechanisms which came to be considered by all participants as valuable assets: small enterprises profited from the low wages paid to apprentices, and big companies from the skill level of the recruited workers; and the system created a dense network of industrial relations between the parties involved and perhaps most important, implied a choice for continuous investments in human skills and thus for a kind of high-skilled production that became so characteristic of German capitalism.[9]

The United States and Japan

Two different examples are offered by the United States and Japan. In the former country, labour relations were even more a battlefield than in the UK; trade unions were practically outlawed by the employers, despite the relative scarcity of labour in the USA. Especially in metal industry, the employers met this problem by heavy capital investments; the needed skills to supervise the low-skilled operators of the machine equipment were provided by skilled immigrants or by graduates from higher technical education. Trade unions, ridden by ethnic divisions, high turnover rates and extreme geographical mobility, were never able to gain control over this pattern of skill formation, even when their adherence in certain industries rose.[10]

When, in the Meji period, Japan set out to modernise, it wanted to get rid of the traditional craft influences, also manifest in the field of skill transfer. Skilled workers, attracted from the UK and later on from Germany, taught the new technologies to Japanese recruits who became really indispensable to the new industries, taught new technologies; but in turn, these men called *oyakata* eventually became a kind of professional elite that developed a strong attachment to their job of training new recruits. The *oyakata* as well as their apprentices were highly volatile and frequently changed employers, to the despair of the big enterprises. However, the latter's struggle during the 20th century to bind these men to their companies by offering them high wages and life-long employment was eventually successful; the war economy and the successive reconstruction strongly favoured the security of in-plant training schemes and an internal company-based labour market that now became one of the pillars of the Japanese business system.[11]

Comparison and relevant questions

As we saw in the cases of Germany and Great Britain, the way vocational training was organised was strongly linked with the overall characteristics of their business systems. In Germany this system created mutual commitments between small enterprises, big companies, the trade unions and the state, which were also visible in other fields of the industrial relations (for instance, in the *Betriebsräte*, the co-direction of the enterprises). In Great Britain the employers wanted to preserve their independency and eschewed binding arrangements; they were strong adherents of the free market as ultimate arbiter and wanted to keep out the state as much as possible. In terms of the 'variety of capitalisms' approach of Soskice and Hall, Germany seemed the archetype of a 'coordinated market economy' and Great Britain of a 'liberal market economy'.[12] But we should be aware of the evolutions of both countries too: in Great Britain, between 1945 and 1973 British governments (Labour as well as Conservatives) fostered an apprentice system, whereas in Germany only in 1969, with the 'big coalition' of SPD and CDU, a truly national system was established. So there might have been a convergence between both training systems between 1945 and 1973, but then the British path resumed its pre-war direction, whereas Germany seemed to reach the logical destination of its road. In contrast to these two countries with comparable factor endowments (natural resources, capital, labour, size of the domestic market), the USA and Japan offer examples of striking differences in this respect. Developments in the USA seem to be determined by the initial situation of scarce labour and abundant capital and natural resources; but Japan, with scarce labour and natural resources and an activist state, offers an example of how certain older values of loyalty and patriotism revived under the influence of war and then persisted on the plant level, thus overcoming the strategic position of the skilled workers. The latter countries strongly suggest two distinct conclusions: first, skill formation was crucial to nascent and developing industrial nations, and second, the factor endowments were important but not decisive in comparison to political and cultural factors.

How does the Dutch development compare with these countries? The Netherlands had an open economy and a small domestic market; and its industrialisation had gained great momentum in the 20th century, placing the skill formation for the new industries high on the socio-political agenda. In this field, we can see a mix of isolated employers' initiatives and some state regulations with very limited effects, at least until 1950, but then the state seized the initiative. So we begin our analysis with the educational system of the state, and then we will turn to what was done in some trades of industry. We will do this by asking specific questions:

- What role did the relevant parties play in the business system in launching initiatives of vocational training, and with what arguments?

- How did the training systems evolve under the pressures of economic and technological changes?
- To what extent were these systems embedded in legal and institutional frameworks?

The answers will enable us to draw some conclusions on the impact of this kind of skill formation on the development of the Dutch business system as a whole, and to compare it with skill formation in other countries.

3. From Lower Technical School (LTS) to Lower Vocational Education (LBO)

In 1863, the liberal cabinet of Thorbecke enacted the Law on Secondary Education, which created a framework for this category of education that was seen as a preparation for access to the university. Technical and vocational education after primary education was not considered a task for the national authority and was explicitly left to the employers, with the suggestion that provincial and municipal authorities might contribute to private initiatives in this field. As a rule, these initiatives originated from civil society: concerned citizens of standing, who wanted to raise the social and intellectual level of the lower-class youth and at the same time stimulate industrialization. As members as such organisations like the Trade and Commerce Association or the Society for the Public Welfare, they set op evening schools and 'drawing schools' where the boys were taught in matters as counting, reading and writing, some basic technology and the reading and making of technical drawings. A steadily growing number of the technical schools began to provide for day education. All these schools were subsidized by local and sometimes provincial authorities and developed a practice of a three-year curriculum after pupils had left primary education at their 12th birthday. To be sure, since 1874, child labour under the age of 12 was forbidden, and since 1901, school attendance was obligatory for all children up to that age. The 1919 Industrial Education Act subjected the curricula to government approval. In practice, however, the boards of the schools were left free to alter them, once the approval was given. More important was a measure taken in 1935, when the three years curriculum was reduced to two for budgetary reasons, thus lowering the schoolable age that in the previous period had been raised to 15. Teachers and trade unions loudly protested, but in vain. Technical education was not yet taken very serious by the authorities.[13]

The post-war years offered a dramatic contrast to this policy. The economic reconstruction of the war-related damages was accompanied by a much more active role of the state in stimulating industrialization, as is demonstrated by the several official government statements on this topic (*Industrialisatienota's*). In these statements and at many other occasions the crucial role of technical

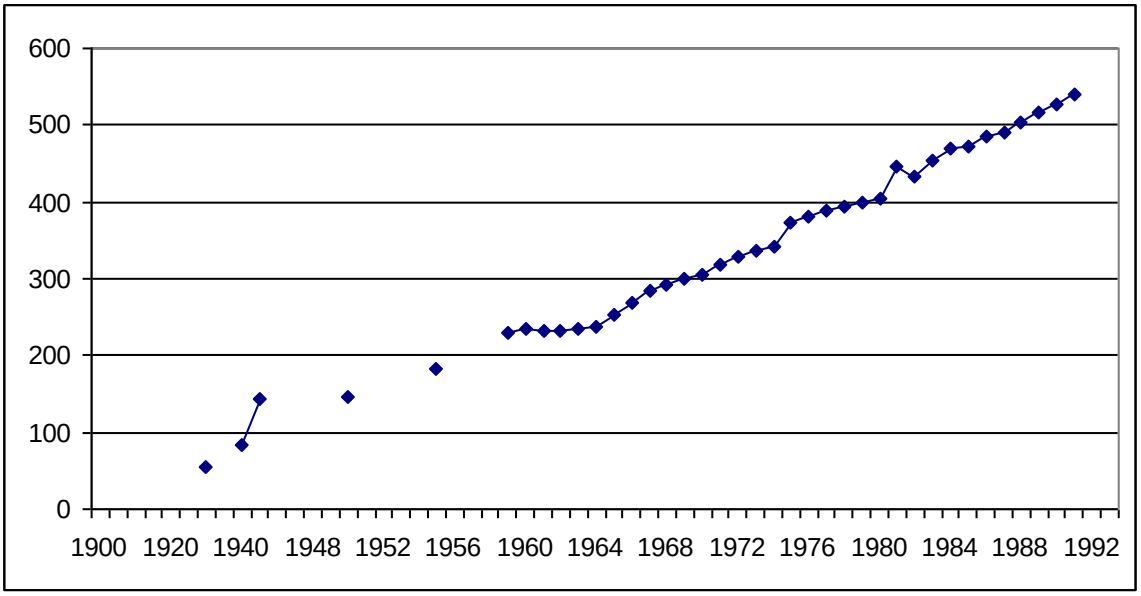
education was now repeatedly stressed. In April 1947, a commission was installed to advise on how to raise the attendance of the technical schools and on how to make the optimal adjustment of this education to the practical vocational training in the enterprises. The great bulk of its membership consisted of educational professionals (from the ministry and school directors). The final report, published at the end of 1948, was unanimous in its recommendation of inserting a preparatory year, dedicated to general and personal education. The two remaining years were each divided into continued general education and practical lessons that varied according to the branch the pupil had chosen. This practical education had to be strictly distinguished from the apprenticeship in the enterprises: here they learned specific, factory-related skills under supervision of their bosses. With this preparatory year the curriculum would again last three years. When a new commission with men from the existing technical schools set out to implement this recommendation, a massive lobby from political and other educational circles convinced a majority in parliament to incorporate the preparatory year as an optional, seventh year of the primary school. But the successive ministers of education, strongly in favour of the a technical school with a three-year curriculum, created possibilities for experiments and exceptions, and these became so wide-spread, that in 1957 this practice of a three-year LTS was legalized.[14] The number of technical schools increased from 132 in 1946 to 202 in 1955, that of their pupils from 36.772 to 68.969.[15]

When we try to analyse who supported this variant of the technical schools and why, two groups stand out from literature. First, we meet a vision with strongly articulated moral convictions: people who wanted to ‘elevate’ the young workers by giving them general education, a broader outlook and developing their personality, which was considered as more important than their vocational training. We find these convictions within the ranks of policymakers in the educational field; but also the teachers in the general education courses were inspired by such thoughts, and perhaps even teachers in the practical and technical courses (but these men will have believed more in the importance of vocational training in strengthening the self-confidence of the pupils). These ideas had at least two ideological origins that were very characteristic of that age: ‘personalist socialism’ which held that personal choices should prevail over class determinism, and the ‘moral rearmament movement’ that intended to strengthen the moral resisting-power of the working classes against negative communist propaganda. [16]
Second, the bigger companies showed a clear predilection of general education, because they were convinced that they had more need of flexible labour with the right industrial mentality than of high-skilled workers: most new jobs were rather easily learned on the spot and were essentially semi-skilled. However, their position showed strong ambiguities: many of them offered apprenticeships to young boys who had only attended the two additional years of the extended

primary school, but allegedly showed the right mentality. This undermined the position of the LTS as preparatory education for the big companies, whereas the smaller companies constantly condemned the lack of specific skills of the trainees. So, despite of all high-spirited intentions, the LTS could not guarantee employment to its pupils, even if they had met all its requirements.

In the meanwhile, there were constant discussions on reforms of the education system, which was realised in 1963 with the *Mammoetwet* (a nick-name hinting at the imposing and all-embracing character of this law) by Cals, successor to Rutten as a minister of education. All types of secondary and tertiary education were now incorporated into one system, with the intention to create better possibilities for the working-class youth to stream through to the next higher type of education and so to fully utilise their abilities. These high ideals of the emancipating potential of education were not materialised, which inspired many succeeding ministers to further reforms, such as in 1973 with the change of the LTS into the Lower Vocational Education (LBO): this type of education lasted four years instead of three, dedicated more hours to general education, and its outspoken intention was orientation on, not training for a vocational career. In 1993 this general character became even stronger; the new type of education that resulted from this reform (Preparatory Vocational Education, VBO) marked the end of lower technical education in the strict sense.[17] But despite all the debates and changes, the part of the youth attending some form of vocational education had risen steadily until 1992, as the following graph shows.

Fig.1: Attendance of vocational education, per 1000 of age group 12-18

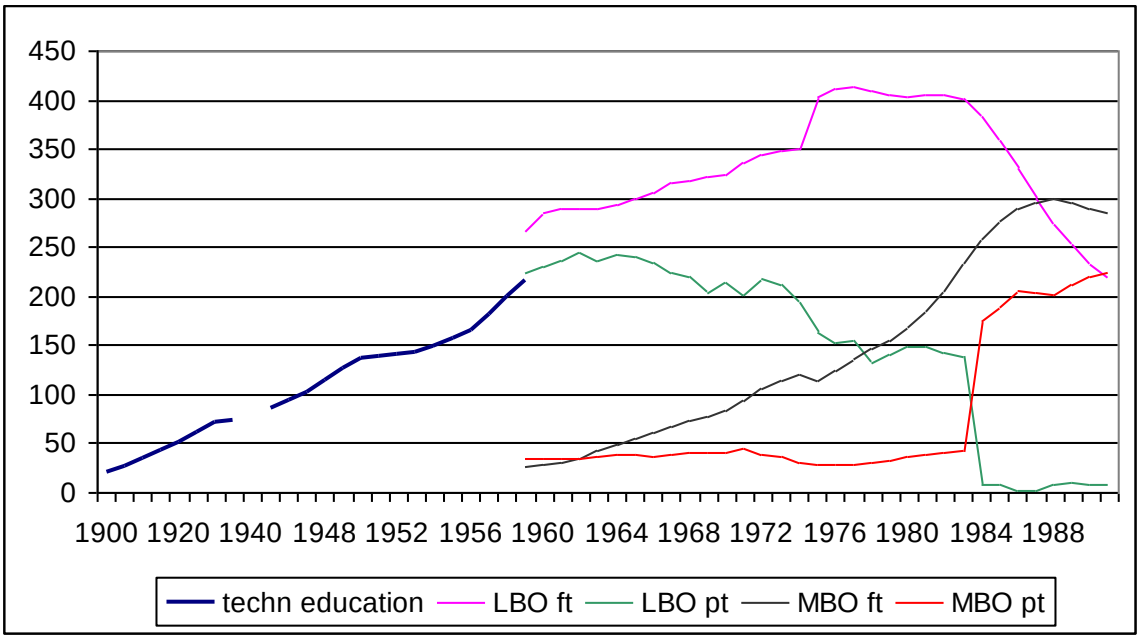


Source: CBS, *95 Jaren*, 242-243.

However, these data are a recalculation by the Department of National Statistics (CBS), made in the early 1990's. The figures as collected on a year-to-year basis

show the difficulties the CBS met in picking up different new initiatives in the field of vocational education, resulting in two major reassessments.[18] If we split up the data this pictures changes dramatically.

Fig.2: Attendance of different forms of vocational education, in 1000's



Source: CBS, *95 Jaren*, 242-243; ft = full time; pt = part-time

Until 1959, there was a subdivision between the different kinds of vocational education: technical and nautical; housekeeping for girls; agricultural and some additional minor categories –all of them considered to be a form of lower secondary education as shown in figure 1. But a growing number of vocational training initiatives was on a level exceeding that of the Lower Technical Schools, for which the term Advanced Vocational Education (MBO) was coined, that also had found its way into the 1963 *Mammoetwet*. Another change in the statistics was the incorporation of the category of 'part-time education'. So, from 1959 on, the statistics were divided into the levels of vocational training, including this part-time education. In 1986, another adaptation was necessary: as the overwhelming majority of the part-time education could no longer be considered as forms of lower education, as a consequence of the higher demands of new technologies, the great bulk of these schemes were incorporated into the category of advanced vocational education (MBO).[19]

The causes behind these changes were manifold. Most important seem the big technological changes from the 1970s on: automation demanded higher responsibilities (machine handling and control, heavy transport) and qualifications (maintenance, administrative tasks) at one hand, and unskilled jobs at the other hand (cleaning, distribution, repetitive machine work). Whereas for the latter jobs were recruited unskilled immigrants and young people without

specific training, for the more sophisticated work the employers retrained older workers or attracted young people with at least an education on MBO-level. From 1979 on, there were experiments with a short (two years) MBO, with no specific entry requirements: this Short MBO attracted many students from the LBO and the lower secondary education schools with no certification; this undermined especially the attractiveness of the LTS. The Short MBO gained an official status in the 1980s and we can see the impact of this change in graph 2.

The results of all these successive reforms[20] turned out to be meagre: there were many drop-outs, and especially the employers in small and medium sized firms complained about the lack of specific training –complaints that also resounded in the appreciation by the trainees themselves.[21] Here the traditional skills were still widely practised. The problems aggravated with the influx of numerous second and third generation descendants of Moroccan and Turkish immigrants with very bad labour market perspectives have made these ambitions utterly unrealistic, as is now widely recognised.[22] Criticism of the lack of specific technical education has never died down; in last years there were experiments with technical courses and a light form of apprenticeship in the VBO, and a growing number of schools is now making use of this possibility, with the argument that many young only want to train manual skills and that many employers are still in need of such workers.[23]

4. Employers' initiatives and workers' reactions

It is against this institutional background that we now set out to analyse some initiatives taken by (groups of) employers, to invest in the education of the new labour force, and the interplay with the changing policies of the state and its legislation in this field. We selected three cases that highlight different motives behind employers' initiatives. The printing industry was archetypical of trade union dominance of the vocational training system, in exchange of their support to the employers' policy of price-fixing. The port of Rotterdam launched an early initiative inspired by strong post war ideological principles. Hoogovens, part of the metallurgy sector, set up its apprentice system as a means to attract workers on a difficult labour market, and faced problems that were very typical to this important part of the economy.

4.1: Printing industry

An apprentice system in the printing industry was in existence during the age of the guilds, but after their abolition in 1795, vocational training was only on an occasional basis, on the spot. Small firms fiercely competed with each other, which resulted in a race to the bottom in price and quality. Vocational training had no priority, except in the medium-sized publishing-houses of books and

newspapers. It was exactly this situation that induced some leaders from the Book Printers Association, representing the established printing and editing houses to invite the leaders of the social-democratic union ANTB[24] to develop a joint strategy, resulting in the collective labour agreement of 1914. This implied a reciprocal recognition of the organisations of the employers and employees as the exclusive representatives of each other's camp, enforced by crosswise sanctions: the printers were to employ only members of the ANTB (and the much smaller denominational unions), and the unions forbade their members to work for non-associated printers. As a consequence, the downward spiral of undercutting tariffs and wages was now reversed; the institutionalisation of this co-operation between employer organisations and trade unions made this trade the most tightly organised and institutionalised of the country.[25]

The closed system of labour relations created its own logic: investing in human capital now became a viable strategy for the whole printing industry. In 1917, a training system was launched, consisting of a four years apprenticeship on the spot that resulted in a certificate. Bipartite regional commissions supervised the quality of the training and contributed to the self-regulating character of the printing trade: only these trainees could enter skilled professions. But it was still difficult to impose this scheme upon the many unwilling smaller firms.[26] The 1919 Industrial Education Act opened the possibility to obtain subsidies for the training system in the printing industry, but only on the condition that training on the spot was supplemented by obligatory theoretical curricula in separate evening schools. This requirement was met in 1930, which resulted in a steady rise of apprentices in these schools and recognition of this training system.[27]

After 1950, raising productivity became a crucial task for the printing industry, where small firms and manual typesetting were still dominating. The trade created several joint[28] institutions: to study and to promote technological innovations, to determine time-rates for different jobs and to raise exports. Delegations of different sectors of the trade visited the USA several times to see how far efficiency was raised; the expenses were covered by funds financed by the Marshall Aid.[29] For the training system this implied that more attention was paid to more modern technologies (photosetting, offset printing) and also to psychological testing of the trainees (not only technical skills mattered, but also a positive and flexible attitude to change and cooperation).[30]

In the 1960's, the training system was confronted with the first big shocks of subsequent technological revolutions, such as photographic typesetting and offset printing. The State Printing and Publishing House (*Staatsdrukkerij en – uitgeverij*), which since 1955 had its own vocational training school, introduced in 1968 a new professional: the 'all-round printing technician' who should be able to qualify for any new job in the trade. Pupils from outside also attended the

training courses, and the whole system was taken over by other training schools in the country since 1975.[31] This turned out to be a crucial decision for a trade where traditional and narrowly defined skills had been the rule from times immemorial. The timing was remarkable: already in 1974, when the transition from mechanical setting to photo-setting was still going on, the *Perscombinatie* (a publisher of several national newspapers) announced the next change: electronic setting. This provoked extended negotiations with the employees council and the trade-unions: their consent was sought and obtained, in order to guarantee a smooth transition to the new technological system -a policy that not only mirrored the dense institutional interweaving of the many oft diverging interests within the trade, but also expressed a shared aversion of the vehement and protracted struggles of the workers and their trade-unions against technological innovations, like 'the battle of Fleet Street' in London in the 1980's. Dutch trade-unions did not demand that texts typed by journalists should be retyped by typographers (as their British counterparts did) and insisted on social measures: redundant workers were either pensioned at an earlier age or retrained for a wide range of possible new jobs. In a mixed advisory commission they were able to convince the employers' delegates who were more interested in economic questions, but when the latter's organisations realised the consequences, they wanted to renegotiate the results. The trade-unions now had to accept that the retraining schemes would be restricted to shorter courses specific to the needs of the printing and publishing companies.[32] This was especially harsh for female workers who had entered the trade in previous years due to their capacities as typists: entrance to the new jobs was strictly reserved to workers with diplomas of the training schools, who were overwhelmingly male.[33]

The next big challenge was the introduction of Apple Macintosh enabling the integration of electronic texts and images. 'Desk Top Publishing' severely hit employment in layout and illustration jobs, but created many possibilities for new and small DTP enterprises. These technological changes have fundamentally altered the landscape of the trade: it now has fluid transitions to new neighbouring domains, like making of websites, cd-roms, videos; these realms have merged into a new domain vaguely defined as 'information handling'. The old trade-union of typographers (organising different professional groups in the printing industry) evolved from *Druk en Papier*, organising all workers in the branches of printing and paper production, to *Kunsten, Informatie en Media* (Arts, Information and Media). The graphical schools have evolved accordingly: they give courses, mainly on more advanced levels of education, for the whole range of the new information industry and are, therefore, again offering a very broad range of competencies and knowledge, in order to prepare the trainees to a very dynamic existence in an ever changing sector.[34] The unions, which have lost influence by the rise of new branches

without closed shop, still have strong positions in this vocational training system, that regulate the influx of new labour force.[35]

4.2: Metallurgy: the *Hoogovens*

The Dutch metallurgy company the *Hoogovens* ('Blast Furnaces') was established shortly after World War I, in order to create a basic industry in a resource scarce economy. It was located quite near to a harbour, where the North Sea Canal from Amsterdam crosses the dunes. Metal workers from all over the country were recruited to start production; but in due time, new young workers were trained on the spot, which happened on an unsystematic, ad hoc basis. Only in 1946 a more systematic training scheme was launched, with general education and specific apprenticeships, all of them organised in, and paid by the company. The latter courses were set up for fitters, electricians, draughtsmen, instrument-makers, turners, smelters, and assistant-operators. For higher functions no courses existed: these employees acquired their skills by long-standing experience, in contrast to France and Germany, where three and four years apprentice systems offered the required training.[36]

A next stage began in 1956, with the creation of the 'Hoogovens Foundation for Education', created with the purpose to obtain government subsidies for the training schemes on the basis of the 1919 Industrial Education Act. The general education and the introduction to the branch technologies were taught in the lower technical Schools in the surroundings, whereas the company employed the apprentices and was to give them specific technical education, for which was introduced a psycho-technical test. In 1958, it stipulated that the trainees, after finishing their courses, had to remain during at least one year, under penalty of having to repay half of their earned wages during these courses.[37] But then the problem of 'over-schooling' emerged: the company training schemes were on a higher level than what was needed in production (the lowest category of skilled and the highest level of semi-skilled). To make things more complicated, it turned out that the different levels of skill were difficult to define and to compare.[38] But 'over-schooling' may be caused by technological changes as well: heavy capital investments in automation changed the skills needed for operating the new equipment, demanding more unskilled labour and at the same time higher qualified personnel.[39] This tendency was demonstrated by changes in the qualifications of the *Hoogovens* instrument-makers.[40]

Growing constraints on the labour market aggravated this disequilibrium between needed and realised skills. The post-war economic boom, in combination with a new wave of industrialisation, created a steeply rising demand of steel. Despite automation, more (low-skilled) labour was needed, but there were not enough new recruits; the better economic prospects were

constantly raising the level of ambition of the young. As *Hoogovens* strictly obeyed to the official wages policy with its rigidly defined hierarchy of skills (1945-1963), income could not make the difference. One solution was to employ migrant workers, in the beginning mainly from Italy. But this was a costly expedient, because it required major efforts in the field of housing and a lot of social work. Another way to recruit new workers remained the training of apprentices, but in this field too the company met with problems. The boys from the technical schools had the expectation to be trained for specific skilled jobs, but *Hoogovens* needed lower skilled workers, with the right attitudes (like cooperativeness, flexibility, loyalty). For this reason, the more ambitious boys kept away from the LTS in favour of the next higher forms of education: the 'extended technical school' (UTS) or the 'extended primary school' (ULO); these pupils were 'lost' for the *Hoogovens*, unless they were employed for the higher skilled jobs. But for these higher skilled jobs higher forms of education were needed, and increasingly even more elevated forms of education.[41]

In the 1970's these contradictions sharpened. First, the new form of technical education (LBO) fell short to the employers' standards, as its critics had predicted: the technical knowledge of the apprentices was far below the desired level. For *Hoogovens* this implied intensified educational efforts. In addition, since 1974 employers were to pay the minimum youth wages to the apprentices, which made investments in schooling even more unattractive. As a consequence, *Hoogovens* announced plans to do away with the whole apprentice system. This aroused fierce opposition by the political parties, and also by the trade unions (that were, to be sure, very critical of the apprentice system in general and had pushed through the minimum youth wages). In 1977, *Hoogovens* had to renounce these plans, but it clung to its agenda by minimising its apprenticeship training and concentrating upon further schooling its older workers: whereas in 1977 only 20% of its personnel was involved in such courses, this had raised to 60% in 1987.[42] This tendency had also to do with a change of this kind of education: no longer on the spot, by experienced workers, but in courses, aimed at teaching certain company specific operating skills. To be sure, this tendency was visible all over industrial Europe.[43]

Second, from 1975 on, a world wide steel crisis, due to the reverse business cycle and a structural overproduction, drastically reduced the numbers of apprentices needed by *Hoogovens*. Thus, whereas these numbers were reduced by a growing unwillingness of the boys in times of good economic prospects, they were now held down by the employers' reaction to economic adversities.[44] It may be argued, however, that this growing criticism of the apprentice system had to do as much with the greater emphasis on general education as with the diminished need for new workers. The trade-unions did their utmost to revive the seemingly moribund apprentice system, and in 1982 they made an agreement

on the national level with the employers organisations to combat the rising youth unemployment by replacing the minimum youth wage by a apprenticeship reward of *f* 2000,- (€ 907) a year, in exchange for a job guarantee of 32 hours a week. Despite the state subsidising now the whole apprentice system *Hoogovens* remained reluctant: it would still cost *f* 30,000,- a year for each apprentice. From 1987 on, training activities were mainly intended for replacing workers under threat of redundancy in other functions.[45] This development had also to do with the position of *Hoogovens* on the steel market: the intense competition caused a merger with the German Hoesch company in 1972, that was not successful and impeded heavy capital investments; when it was undone in 1982, *Hoogovens* set out to modernise, launching a policy of diversification (also engaging in aluminium production) and integrated automation systems that substantially rose the level of the required skills. Technical education needed for production still is on the middle and higher level, and retraining older workers to adapt them to new technologies is now the common practice.[46]

4.3: Dock labour in Rotterdam

Dock labour was generally held in low esteem. It was considered the last resort for workers without perspectives on the labour market, or for those who did not want to bind themselves to regular jobs or even a definite trade. The justification of this negative attitude was the view that no specific skills were needed for the task of handling cargoes. However, recent comparative research showed that the way these skills and competences were organised differed considerably from port to port. For instance, in London these were monopolised by teams of workers (including a foreman), which subcontracted specified, handling operations, such as loading or unloading certain categories of goods, in the holds, on the quays or in the bonded warehouses. These teams co-opted and trained new members who, as a rule, came exclusively from their own quarters, located quite near to their work. This strict division of tasks created numerous intersecting and overlapping demarcation lines that were jealously guarded against the infringements of other teams. The situation in Rotterdam was radically different: here the knowledge of how to load the different goods into a ship, or how to safely unload a ship, was the competence of the foremen and the bosses, and the ordinary dockers could be hired for any task (although, to be sure, the employers worked with a fixed number of regular teams for certain handling operations, but this was for the sake of convenience, and not a right for these teams). The difference between these two harbours derived from their history: whereas in London this division of labour stemmed from the times of the sail-ships and was perpetuated by guild-like organisations, labour relations in the port of Rotterdam were created almost *ex nihilo* in the 1880's, with the explosive growth of the transit of bulk goods to the German *Ruhrgebiet*. Thus, official skills were concentrated in the functions of the bosses and the overseers,

but in the team important practical and informal skills were shared by experienced dockers and transferred to recruits.[47]

Whereas in some regular teams an experienced worker was appointed to give instruction, the vast majority of the dockers learnt their job simply by doing it. Some stevedoring companies recruited unemployed boys with secondary education to train them for higher functions (overseers, bosses), but most employers wanted to select men for these jobs out of their experienced personnel. But as such careers took a very long time, these men were always rather old when they reached this position, and therefore, they were scarce. To make things worse, in 1939 the Stevedoring Act of 1916 was changed: the 8,5 hour working day now also applied to overseers and bosses, who normally were present long before and after the shifts. Discussions on the necessity of training schemes for these functions waned with the outbreak of the war, but revived in 1944. But then the discourse took a remarkable turn: the commission of working out a training scheme was given to F.J.T. Rutten, professor of applied psychology, who had also devised the vocational school for the State Mines in 1945. One branch of this school was destined for boys in the age of 14 to 18 years, who were not yet allowed to work underground: very interesting for ports where the Stevedoring Act forbade dock labour to boys of the same age, and where the young workers had to be seduced to return to the port after their military service. Rutten had given a prominent role to educational and pedagogical elements, and had implanted the troop system of the boy-scout movement into the curriculum of the school.[48] The eventual proposal was a victory for the current advocating a radical change of the old labour relations and better perspectives to the ordinary dockers, on the more conservative employers who merely wished to train more specialised employees (overseers, bosses, crane-drivers, controllers, etc.). The proposals of Rutten, put forward in 1947 and practised from 1949 on, implied a voluntary training program for workers aged 18-30, including the casuals, with the aid of older experienced employees (with the hidden intention that they were educated too by educating the younger workers); a second course for the best pupils for specialised functions, and a third course for those out of the preceding two, who were considered capable for leading functions. The first stage, the vocational training for dockers, started in 1949, on an old ship; in 1950 followed the training scheme for overseers and foremen, and in 1951 for bosses. [49]

This scheme showed a clear break with the original intentions: it started with the ordinary dockers (even including the casuals) and aimed at rejuvenating the intermediary ranks in the port. By training the middle ranks partly outside the companies, their grip on these workers, who in the old situation were totally moulded in the company where they had to make their career, might be loosened. This consequence was foreseen and even desired by the reform-

minded wing of the port employers: when they asked Rutten to design a plan for vocational training, they knew about what he would say. The only difference was the omission of a scheme for apprentices in the age of 14-18, but in 1949 a commission was installed to fill this gap. After a new consultation of Rutten, now minister of education and sciences, an apprentice system was launched, to bridge the age gap between primary education and military service. The first year of this Port Vocational School (*Havenvakschool*) served as a period of trial; the next two years were dedicated to a basic training as certified docker, and the next two years they were trained as apprentices in the port companies, and in the last of these two years they could get some training for a higher function, which should give them an incentive to return to the port after their military service, in order to continue on this path. A third of the lessons were dedicated to general education (Dutch and English, some history and geography, arithmetic, port and navigation), one third to basic manual skills and the rest to physical and cultural activities. The social organisation of the schools was inspired upon elements of the boy-scout movement, as in the mines: opening and closing ceremonies around a flag, troops with a leader and a booklet with each boy's personal progress. Remarkably enough, this whole approach was also inspired by non-economic motives, namely of the Oxford Movement of Moral Rearmament. With this kind of education of ordinary dockers, the initiators wanted to strengthen the moral and ideological resistance to communism and other forms of radicalism: they organised small meetings for selected people from the port, who were also invited to visit one of the conference centres in Caux, Switzerland.[50] To be sure, this ideologically inspired appraisal of the 'human factor' in the enterprises was not unique in these post-war years: it was a common denominator of different currents of a Christian-humanistic inspired variant of 'human resource management'.[51] But the novelty was that this approach was now adopted to such workers as ordinary dockers. Rotterdam was the first port in the world to launch such a comprehensive vocational training system. Delegations from all over the world visited the port to see how it worked and, in some cases, to imitate it. Important to its image was also the visit of the Dutch queen in 1954 to the *Havenvakschool*.[52]

One explicit aim of this whole vocational training system was to lend dock-work the status of semi- or even full-skilled labour, and so to enhance its status on the labour market. This was necessary with regard to the wage-policy of the post-war governments that set strict limits to the wage levels of the different types of labour, in order to stimulate the reconstruction of the damaged economy and the export of Dutch goods. As most dock labour was defined as unskilled labour and, therefore, belonged to the lower-paid categories, the only way to attract the badly needed number of young dockers would be this higher status and the resulting higher wages: the port traffic enjoyed a spectacular growth, placing Rotterdam in 1962 at the first place in the world. In that same year certified

dockers obtained the status of skilled labourer. Another target had to do with the social relations in the port: in 1945, the radical Unitary Trade-Union Movement turned out to be the strongest organisation in the port of Rotterdam, surpassing the (weak) official trade unions. The same lack of professional specialisation that had made unionisation so difficult before 1940, now seemed a factor of strength: the key role of Rotterdam in provisioning the country and an unprecedented scarcity of labour enabled a new and charismatic leadership to mobilise all dockers against the traditional unions, that were accused of too much pliability during the war, and against the wage policy, that prevented them to reap the fruits of this new position of power.[53] The more far-sighted and reform-minded employers had grasped this connection: the vocational training system, in their view, should also serve to break up the uniform mass of dockers by offering them individual career possibilities.[54]

The scope of the vocational training system has been steadily expanding. The numbers of trainees grew from 737 in 1951 to 4779 in 1965, that is from 5,7% of all dock workers to 28,6%. At the end of 1959, the *Havenvakschool* had trained 21% of the ordinary dockers and 24% of the controllers and the bosses and as much as 76% of the foremen. [55] A problem with the dockers was that despite all efforts to raise their status and to bind them to the port, the yearly turnover oscillated around 40%. This was not exceptionally high compared with other manual workers, especially in times of a booming economy, but it certainly not proved the success of the vocational training system in this respect.[56] The number of the specialised courses for different jobs was also constantly raised, mainly to meet the new demands of technological developments, such as the introduction of the pallets and the fork lift trucks.[57]

The *Mammoetwet* had considerable consequences for the vocational training system in the port: it was split up into three sections: one for the youth after primary education, one for retraining adults and one for the higher jobs. The costs of these different courses were divided between the state, the municipality and the employers. In 1973, for instance, the state paid 50% (for the boys up to 18 years), Rotterdam 3% (for adults) and the port 47% (for all categories).[58]

In the meantime, the socio-technical landscape in the port was changing drastically under the impact of the introduction of the containers. From 1967 on, manual cargo handling was on the retreat, reducing the demand for traditional dockworkers and their skills. Thus, the competences embodied in the team of experienced dockers, since 1962 certified as skilled workers, became less relevant with the containerisation. Nevertheless, these workers stuck to this kind of work, and the employment effects of the gradual replacement of general cargo and bulk goods by containers were neutralised by the gradual streaming out of the aging redundant workers. For the functions in the container sector new

people were recruited from sectors without heavy manual work: insurance, shop keeping, office jobs, river navigation.[59] In this respect they differed from the commuters who came to the port in the 1960s to handle general and bulk cargo: these men were agricultural labourers, construction workers, removal men, etc.[60] Remarkably enough, the fundamental changes in transhipment techniques since 1965 did not produce big strike activities to protect employment or to stop these technological innovations, as was the case in the USA, the United Kingdom and Australia. The strikes of 1970 and 1979 were mainly for higher wages. The position of the official trade unions was crucial: they had a positive view on technological innovation and were only willing to negotiate on the negative consequences for redundant workers (as was the case with the minor 1987 strike).[61] A further explanation might be that the *Havenvakschool* offered a possibility to be trained for the new jobs.

5. Characteristics of the Dutch system

Initiatives from different sides have long time co-existed, creating a loose patchwork with overlaps and big lacunas. Several employers had started training schemes at the beginning of the 20th century, when the government promulgated the 1919 Industrial Education Act, but neither the content of the courses was determined, nor was the attendance enforced. In the meanwhile, more and more enterprises developed training schemes, following their own priorities and predilections. We selected three of these, and we are now able to resume the main differences and similarities.

First the incentives behind the founding of the training systems. In the printing industry the apprentice system was the central pillar of the trade-union strategy: it regulated the influx of new workers and hence the power relations on the labour market; the employers were more interested in the support of the trade unions in maintaining the tariffs. As a whole, its apprentice system came closest to the German one in its defence of the traditional craftsmanship, be it that the graphical schools had to meet the demands of general education of the LTS. The *Hoogovens* apprentice system was founded to meet the demands of a rapidly expanding steel company in a region with many more labour-intensive industries, and so to assure sufficient labour of the required skills. But it turned out to be not so simple to determine what kinds and levels of skills were needed. We can see a continuous reconsideration, culminating in the decision to drop the whole apprentice system. The eventual outcome was a preference of retraining older workers. The *Havenvakschool* was a project of the more far-sighted port employers to enhance the status of the ordinary dockers; they wanted to bind them to the port (they could not compete on wages) and to create more differentiation within the ranks of the dockers in order to break up their homogeneity. But just as conspicuous was the inspiration of the Oxford

Movement, that was also visible in the management of the *Hoogovens*, but was absent in the printing industry.

The business cycle exerted some clear short-term influences on the choices of employers and workers with regard to training. A greater stress on general education and the official extending of the schoolable age accompanied the big boom of the 1950's and the 1960's, with the tense labour market and the resulting pressure to enter jobs on an early age. Young workers showed different ambitions: they wanted specific education in order to get the best jobs possible and would not bind themselves too soon. Employers would then prefer flexible workers with more general qualifications, as we saw in the printing industry and *Hoogovens*. By contrast, during the depression of the 1970s and early 1980s, both parties showed opposite preferences: workers wanted general training in order to be more protected against lay-offs, whereas employers only wanted the specific skills they needed to survive. Our cases seem to confirm this tendency, but these decades were also the time of profound technological revolutions, that created a totally different socio-technical landscape with dramatic changes in the required skills: photo-setting and the computer in the printing industry, automation and diversification at *Hoogovens*, containerisation in the port of Rotterdam. Whereas the workers dismissed as a consequence of a downward turn of the business cycle could always hope to be re-employed in the case of economic recovery (if they were not too old), technological changes asked for different kinds of workers, with different qualifications. Here the role of the training systems became crucial.

The trade unions had a firm grip on the training system in the printing industry, and were able to use retraining programs to safeguard the jobs of their (male and older) members, at the cost of the women and the young. At *Hoogovens*, roughly the same happened, but here on instigation of the management, supported by the works council. In the port, where the vocational training system was launched and dominated by the employers, the (relatively older) dockers were phased out, and recruits for the new jobs were found outside the port; again, the vocational school played an important role in this reorientation. In all these cases the (re)training systems were very functional in absorbing the shocks of technological changes, but the power relation between the different parties determined what group had to carry the heaviest burden. This was also reflected by the composition of the boards of the foundations that administered the industrial training systems. In the printing industry, it was a matter of a rather corporatist bilateral structure, with the trade unions as the most expert and dedicated party. The management was decisive in the *Hoogovens* foundation, but was supported and critically followed by members of the works council and representatives of the local authorities. The employers dominated the vocational training foundation of the port of Rotterdam, but these had to balance diverging

kinds of interests within their ranks (as was the case in the printing industry); there were also representatives of the municipality and the (official) trade unions. As a consequence, in all cases the employers did not decide unilaterally on the contents and structure of the training systems. They were in constant discussion and negotiation with the trade unions, also in the context of the highly institutionalised system of collective labour agreements; but the legal educational framework with its subsidies played an equal crucial role.

When we return to the role of skill formation in the Dutch business system as a whole, we may conclude that only after 1950, technical education of the young became a point of concern of the different actors of the business system, which had already taken decisive steps towards economic coordination well before 1940. The integration of technical education into the coordinated character of the Dutch business system reached its apex with the *Mammoetwet* that comprised all types of secondary and tertiary education for the youth. The system that resulted showed more institutional coherence, but did not solve the dilemma between the demand of general education and a good attitude at one hand, and the need of more specific skills that could be put into practice immediately, but the balance tipped more and more to the first option. After 1975, lower technical education lost ground to vocational education of a higher level and to courses of retraining older workers; for the remaining low-skilled jobs now also immigrant workers were attracted. This implied that, in terms of coordination, the technical education system had lost much of its importance, but it was not given up as a field of joint concern of the state, the trade unions and the employers' organisations, as the ongoing debate and successive legislative interventions show.[62] The Dutch system of technical education was not as central to the overall coordination of the business system as it was Germany, but played certainly a role: by steadily arousing public discussions of the best way to solve these problems jointly. In the UK and the USA such discussions did not emerge at all, as skill formation is still seen here as a private investment in one's career.

Erik Nijhof, Dept. of History
Utrecht University, The Netherlands (BINT Project)

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[20] For these discussions and changes, see Wolthuis 238-277.
[21] Meijers 211-225.
[22] A Parliamentary Inquiry Commission into the education reforms of the last decades, presided by the social-democrat Dijsselbloem, has recently published their findings, that were particularly harsh to the policies of the ministers of education during those years, many of them being social-democrats too.
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