A Mutual Approach of the German and Japanese Vocational Training Systems in the Automobile Industry

Tielsch, Markus

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A Mutual Approach of the German and Japanese Vocational Training Systems in the Automobile Industry

Markus Tielsch

Abstract

Vocational training is one important interface between companies and their employees. It combines the training of functional qualifications like technical skills, and extra-functional ones like attitudes towards the individual himself, his work and company. The strategy of vocational training in large Japanese companies is of great interest, because it emphazises extra-functional qualifications to a much higher degree than vocational training in Germany. One can speak of a 'comprehensive socialization' of the employees to further their high levels of commitment and productivity. Discussing the advantages and disadvantages of the vocational training for workers at large Japanese and German automobile makers, we see the chance of a mutual approach of both systems. This mutual approach could combine the advantages of the Japanese training strategy like high labor efficiency with the advantages of the German strategy like professionalization, to cope with the problems both countries are facing at the present at the shop floor level, namely the growing demand of specialization in Japan, and more flexibility of professions in Germany.

1. Present vocational training at car makers in Germany and Japan: Functional qualifications versus extra-functional qualifications

1.1. German vocational training under conventional mass-production

The so-called 'Dual System' is a combination of in-company training of nation-wide acknowledged professions on the one hand, and the learning of general vocational subjects in a public vocational school on the other hand. Professions have not only clear specifications, but are also influenced by governmental regulations and union interests. After a successful training period of at least three years, a skilled worker must have spent some more years in practice before embarking on a training course to become a Meister. By law, only a Meister can supervise trainees, and they are seen as important key figures presiding over the induction of young persons into the working life (Pritchard, 1992: p. 135).

The vocational training under the dual system produces skilled workers of high qualification levels in the German automobile industry. But even at the work shops of German luxury car makers, large costs and production time are necessary to fix defects which occured during assembly (Womack et al., 1990: pp. 90-91). Compared with Japanese automobile makers, German assemblers also need twice as much working hours to produce one car, besides the fact that Japanese car factories have less inventory and develop new models in much shorter cycles. And besides the fact that the core of production organization is also the work at assembly lines which is often associated with low work motivation and high costs of defects or absenteeism.

Compared to the so-called 'lean production' (LP) in Japan, we can indentify two main sources of lower productivity in the German automobile industry. One is the organization of production and work under traditional mass production. Since Japanese lean production is also based on work at assembly lines, we only focus on the negative effects of the separation of work from planning and control under the Tayloristic organization. Here, we can see extreme estrangement or lack of communication between the shop floor workers and staff experts in German plants. Status barriers and low feedback of work quantity and quality to the workers prevent the transparency of the work organization, and has a negative influence on the motivation and development of competences for many workers (Wiswede, 1981: pp. 227-230). Another problem of this rather 'scientific management' is that quality control and maintenance are in the hands of specialists which seems to lead not only to lack of the production workers' motivation but also to enormous costs in quality achievement.

The second problem seems to be the dual system itself. The apprentices at German car makers are seldom drawn directly into production work, because for the most part they are trained at maintenance workshops (Jürgens et al., 1993: p. 309). The majority of skilled workers, who successfully passed their apprenticeship, work at jobs that demand lower skills (Sadowski, 1980: p. 1). Further in-company vocational training in German factories focuses mostly on already skilled workers or employees in lower management positions (Richter, 1981: p. 129). Lean production and innovative technologies change demands on professions rapidly. Consequently, the present training of craftmanlike skills and learning of specialized knowledge could lose its importance.

One can say that the contents of vocational training in the

German automobile industry has been dominated by functional qualifications, like technical skills, whereas the extra-functional qualifications, like attitudes of workers towards their work or company in a sense of 'socialization' rather appear to be a non-systematically achieved by-product of the training process. To understand the relation of extra-functional qualifications with the productivity at the shop floor, a look at the vocational training of Japanese car manufactures is important.

1.2. Vocational training at Japanese auto makers under 'Lean Production'

The main difference of the vocational training at Japanese auto makers and the dual system in Germany is that the responsibility of vocational training in Japan lies only within the companies, which can train according their own concepts without influence from the state or unions (Georg, 1989: p. 113). Neither public vocational training, nor education in the school system determine career patterns like specialized skills of workers in large Japanese companies. The educational level only influences their vertical segemented entrance and carrier chances. Consequently, there is no 'professionalization' of skills like in Germany. Vocational training and further education in the companies are only integrated elements of the corresponding companies' work and personnel policies (Georg, 1994: p. 179).

The main goal of vocational training is to form car workers into broadly qualified 'generalists', who are able to adapt to flexible working conditions of LP. They not only perform direct production tasks, but also indirect tasks like quality control and maintenance. Therefore, the personal policy of permanent vocational training is the core of training in Japanese car companies to develop the full performance

potential of their workers (Staudt & Rehbein, 1988: pp. 91–92).

There are four main categories of in–company training at Japanese auto makers. The training at the workplace (OJT) is the core of in–company training. Differences between the requirements of certain jobs and actual skills of the workers are fixed by systematic training during work (Staudt & Rehbein, p. 127). OJT allows the exchange of work–related information, like the present status of productivity or quality of production levels, between the workers and higher levels of management at the shop floor, and creates the flexible horizontal allocation of the workers at different workplaces.

OffJT means in–company training beyond the actual work process in company–owned training centers. The group–wide OffJT mostly prepares lower management and group leaders for the introduction of new production technology and for job rotation.

So–called 'small–group–activities' (SGA) cover many activities of employees, from daily production work to leasure activities. Here, we focus on the 'quality control circles' (QC). QC members are mostly the members of a work group, who meet after work to discuss production–related problems under a group leader. The training of the group leaders themselves is very important, because they vertically cooperate with other specialists of the section and enable the horizontal information exchange on their group leader level. Furthermore, they should be able to support group cohesion (Zink, 1987: pp. 59–67).

And the as a fourth category of vocational training, large Japanese companies support the individual acquirement of knowledge from outside the company–context through self–studies. Employees are then encouraged to apply this knowledge at their daily work. These individual efforts become more and more relevant for transfer, promotion and boni of the employees (Dore, 1989: pp. 95–96).

The processes of socialization at Japanese car manufacturers, i.e., the focus on extra-qualificational skills, rather than technical skills of the workers, seem to be a main reason for the high productivity on the shop floor.

Compared to Germany, most Japanese students on the secondary level of school education have only a minimum of vocational knowledge (Ernst, 1994: pp. 291-293). But commitment, solidarity, efforts and egalitarism learned in Japanese schools appear to be important instruments of socialization for the later working life in an organization (Singleton, 1989: p. 8). Long-term employment in large Japanese companies furthers the identification of the core employees with their company rather with a profession, like in Germany. The labor markets are incorporated in the companies and in-company mobility replaces inter-companies' mobility. Due to long-term employment and in order to achieve the successful socialization of their employees, large Japanese car companies try to recruit as their core employees persons without previous working experiences, and who seem able to adapt to the respective company's 'culture' (Oliver & Wilkinson, 1992: p. 46). In this exclusive in-company labor market social qualifications like adaptability, subordinance, and group orientation are thought as critically important traits. Socialization is 'education' in order to use the potential of the whole employee (Bergmann, 1991: p. 97).

The training and work relations between the superiors and their subordinates are characterized by authority and loyalty, and of power and trust, even with emotional moments. Whereas in Germany these relations are more of social distance, emotional neutrality or even distrust. Since the middle of the 1950s it is the strategy of Japanese management to create the work organization in a way to transform this trust into performance and productivity (Bergmann, pp. 97-98).

Beginners are ranked by senior employees referring to the beginners' preferences and fields of application. Later in production work, engineers are more strongly present on the shop floor and their jobs and career paths overlap with those of the most senior production workers. This reduced vertical distance between superiors and subordinates makes 'face-to-face-communication' easier, further supported by managers who spend much time at the shop floor (Oliver & Wilkinson, p. 52). Direct superiors also evaluate their subordinates in respect to level of qualifications, quality and quantity of performance, and attitudes and behavior. This kind of evaluation of employees means their education and social control supporting and connecting individual skills close to the companies' requirements (Bergmann, pp. 99-100). In general, the division in charge of personnel training decides on all questions of vocational training, but actually the foremen at the line strongly influence the vocational training measures of their personnel. So, the workers have to follow their superiors' decisions on training measures, but their own requests will not be considered (Foljanty-Jost, 1989: p. 389).

Now we look at the aspects of socialization through OJT and rotation. OJT is mostly conducted by senior or experienced superiors. Besides the acquirement of workplace-related knowledge and skills, OJT also serves for the improvement of cooperative behavior and responsibility. Senior superiors often play the role of a consultant also in private matters of his subordinates (Muta, 1994: p. 197). Rotation between different jobs, sections and departements can be found on every level of hierarchy. On the shop floor level of car makers rotation is shorter, less systematic and depends on the respective group leader, but it serves for the acquirement of job experience, the adaption to company norms, sharing of work-related information and to in

-company communication (Georg, 1990: p. 59).

The group principle plays the central role in car production, using informal aspects of group relations for the goals of productivity and social integration. The group functions for the individual as social network, educational authority, place for learning, unit of performance and quality regulation (Jürgens et al., p. 48). Inidividual cooperation in the group-context becomes a necessary requirement, because there is no fixed attachment of jobs to a certain individual workplace, and no piece-rate-wage system of individual performance. At the same time, pressure for performance arises within the groups, because individual performance will not be reflected in the wage system like in Germany, but in the possibilities of access to higher qualification and income levels (Bergmann, pp. 98-99).

Summarizing, we want to note here that conventional mass-production at German car manufacturers has been supporting a vocational system focused on functional skills. The separation of work from planning and control under the rather Tayloristic organization, the barriers stemming from status and professionalization, and the lack of extra-functional qualifications at the shop floor seem to be the main reasons of the lower productivity at German plants. In contrast, the Japanese car makers under the more flexible LP seem to focus more on extra-functional skills, i.e., a systematic 'socialization' of the workers at the shop floor, which seems to be a key qualification to achieve much higher productivity.

2. Mutual approach on the level of functional and extra-functional skills?

2.1. 'Japanization' of German car makers?

The most important result of the studies conducted by Western companies to understand the competitive superiority of Japanese auto makers was the insight that technical factors played a secondary role: factors like personnel management, industrial relations, work organization, and labor deployment were much more important causes (Jürgens et al., p. 3). But in the debate about the possibilities to utilize these factors in the German automobile industry, strong criticism arose especially from the angle of the 'humanization of work': the work groups as strict control mechanisms, JIT and the quality maxim terminating the workers' autonomy, and the similarity to the Taylor-Ford principle.

After a more experimental phase to 'humanize working life' under influence from the German government and unions in the 1970s, Tayloristic principles of car production only started to change in the 1980s under the impact of Japanese competetiveness. Work groups are seen as the key element for job-enrichment, job-enlargement, job-rotation, employee participation, reduction of hierarchy, and wide-scale qualification programs to make more extensive use of the workers' skills (Wannöffel, 1991: pp. 196-197). From the German social-political perspective of 'humanization of working life', the Japanese practices of LP and the work organization in groups have been strongly rejected.

The Japanese-style work group is a basic element of LP, but seems to function as a strict control mechanism. Group work here is totally different from the concept of work groups in the German view as

'semi-autonomous groups'. Semi-autonomous groups consist of differently qualified workers who have influence on work content and work time, represent a cutback of hierarchy, and participate in the interest representation. Whereas work groups in the Japanese concept describe only segments of the production process, have no influence on work content or work time, and underlie highly standardized jobs and strict machine pace. Job rotation only occurs in the same production segment, and the jobs in final assembly are reduced to a low skill level (Altmann, 1992: pp. 54–55). Further represent work groups no cutback of hierarchy at the shop floor, since LP at Japanese car makers is too sensitive against defects and disturbance to reduce the number of superiors (Berggren, 1991: pp. 37–39). Participation in Japanese industry only means the consent of the workers towards measures of the management. Consequently, the Japanese understanding of work group does not mean a stronger autonomy of the workers, but appears as an extension of the management control (Berggren, pp. 61–63). Another aspect of more indirect control through the management is that peer group pressure is a very efficient way of social control, much more efficient than Taylorism. The low rates of absenteeism is no result of a high work commitment or loyalty towards the company, but rather the result of pressure from group collegues and superiors under more informal or rather intimate relationships (Altmann, p. 55). The price for the individual group member is his rigid separation from other social subsystems in the same company, or outside like his family or community (Deutschmann, 1991: pp. 96–97).

JIT and the quality maxim seem to neutralize the workers' autonomy through the elimination of 'waste': no 'idle time', no sufficient numbers of relief workers. To identify 'waste' is the reason, why LP furthers the transparency of all production processes (Berggren, pp. 59

–61). The efforts for 'permanent improvement' underlie only the goal of rising productivity by stabilizing this production process that is stripped from personnel and material buffers. Improvement efforts never improve autonomy or create relief for the workers. Japanese management always stresses the motivating effects of the participation at the improvement process, and the number of improvent suggestions play an important role in the personnel rating (Altmann, pp. 55–56). But not only to perform well, also the readiness of the workers in LP to accept flexible working times and overtime secure productivity and stability of LP. Not only have Japanese workers longer working weeks, but also overtime of 2 hours or more per day can be arranged any time at the descretion of the employers without interference of the unions. Further enjoy German workers all of their paid holiday of 30 days or so, but their Japanese collegues often give up almost half of their entitled 18 paid holidays (Kumazawa, 1992: pp. 101–102).

A third argument against the practices of Japanese car makers is that of the similarity to the Taylor–Ford principle. LP is a new strategy of the mass production in the automobile industry, due to production in small lots or minimum buffers, but 'scientific management' in regard to work design and standardization was not changed. Due to the bufferless production organization, defects or absenteeism become visible immediatly and create the same Tayloristic effect of preventing 'output restrictions' from the workers (Berggren, pp. 40–41). In Japanese car plants output flexibility is achieved by flexible use of the work force, but production technology itself does not contribute much to flexibility. Japanese car plants also show very short cycle times, and 'multi–skilledness' is often reduced to line–ups of simple, fool proof jobs. The organization of direct production has often super–Tayloristic character: most of the simple assembly work is

performed by temporary staff, while core workers perform more complicated work like adjustment and control. This form of intra-plant division of labor allows the Japanese companies to hire and fire unskilled workers at short notice to adjust the labor force to production requirements. The core workers likely submit themselves to this regime in return for being offered career perspectives (Demes, 1992: pp. 478-480).

But in spite all criticism against the Japanese methods, German auto makers have to face lower productivity. We have to look at the necessary changes from the angle of vocational training with innovative technology at the shop floor and also to cope with the higher competitively of the Japanese automobile makers.

Due to the focus at functional qualifications at German auto makers, first major changes in the vocational training occured at the beginning of the 1980s accompaning the modernization of production through robotization and computer-related work at the shop floor. The growing demand for electrical and electronics related skills has led to restructuring in the apprentice training, away from mechanical in favor of electrical trades. A further trend is the gradual disappearence of the boundary lines between maintenance and production in the automation areas to broaden the range of tasks of the individual workers, but also to reduce their number. New job profiles for skilled workers deployed in direct production in direction of automated production and quality control (Jürgens, et al. pp. 312-316).

German automobile makers also realize the problems of a 'professionalization' before the working career has even started. The problems here are the fixation in profiles of specific professions and the rigid demarcations between them. With growing differenciation of markets, standards of vocational training beyond the companies' needs

represent an obstacle for company-specific strategies to achieve more flexibility. Therefore not a specific profession, but work related learning could become the permanent requirement for a German auto worker's career (Georg & Demes, 1994: pp. 505-507).

To cope with the growing importance of further training in the factory at the beginning of the 1980s, the companies enacted measures of continous training for target groups in the non-skilled area who had up to then been almost untouched by such measures. But West German car companies emphasised rather on continous training of the skilled workers, and training for non-skilled workers in order to qualify them for the demands of the new technologies was neglected. Training activities related to new work and motivation concepts and the further training played a marginal role (Jürgens, et al. pp. 317-320).

But the situation at the end of the 1980s changed under the policy of more frequent car model changes and team orientation. Apprenticeship training itself has become more team-oriented and more related to realistic production situations with the large-scale technological and organizational adjustments for model changes. In addition, there have been various training measures in connection with the introduction of problem-solving groups and supervisor training in participative leadership. New was the further training of direct production personnel in the areas of trim- and final assembly. Assembly workers can voice their concerns and make suggestions for improvement during the test phase of pilot lines: workers, supervisors, and production engineers discussed process details and possibilities of improvement. There is the growing awareness of the companies of the necessity to involve their work force in dealing with the large technical and organizational transitions and to use the experience and knowledge of the work force in setting-up new processes (Jürgens, et al. pp. 320-

322).

Less segmented job profiles seem to develop in the German automobile industry to cope with the growing demand towards a more flexible production through the utilization of innovative technology. But further training, that is also of key importance to train extra-functional skills, seems to be reduced to the improvement of functional skills of already skilled workers' while the majority of semi-skilled workers seem to be neglected. Further, training activities related to new work and motivation concepts –mostly at pilot plants or experimental production lines– seem to play a marginal role, and to be dropped after the model start, when many foremen slip back in authoritarian leadership style to reach the output. In other words, there seem to be no improvement in the systematic training of extra-functional qualifications towards a socialization of the workers to attain higher levels of productivity, like we can see in the Japanese automobile industry.

2.2. 'Germanization' of the Japanese car makers?

Concerning the German criticism against the 'non-professionalization' of workers under the Japanese vocational system, one can argue that ciriticism is not relevant, since Japanese core workers identify themselves with their company rather with a profession, that they enjoy employment security, high wages and social reputation. But we think there are already changes like rationalization measures even threatening the privileges of core workers and the negative image of 'just being a blue collar worker' in an era of change into a society modified by the needs of the tertiary industry. Other limits of the most successful production regime in recent times are becoming apparant, like the indications of exhaustion of the privileged group of

the core work force at the assembly lines and the change in values of the younger generation (Jürgens, et al. pp. 393–394). Coping with these problems Japanese car makers seem to face two main reasons which could change the present system of vocational training. One is the growing utilization of innovative production technology, and the other reason derives from a demand for the 'humanization of working life', which both could call for an increased 'professionalization' of the workforce at the assembly lines.

Japanese car makers have been introducing more stepped-up automation of production operations and the use of computers in areas where previously they had especially appreciated the flexibility of human labor. But high-tech transfer lines for large assembly sections, stationary assembly islands, work on stationary assembly platforms and so forth create a growing demand for specialized qualifications, which can not be developed in the internal labor markets through the existing combination of OJT, group principle and rotation on the shop floor level. From the German perspective, like said above, 'poly-qualification' means no higher qualification. In the context of LP at the Japanese automobile industry poly-qualification rather means the mastering of work tasks on an identical level of requirements, i.e. qualification based on a job and process design that follows the principle of 'simple is best', respectively the most simple and standardized design of jobs. Besides an intensification of the work load, this principle brings enormous flexibility for the plant, but does not mean higher qualification for the workers (Altmann, p. 57). Also the picture of a 'generalist' via rotation through many sections and departments of a company is rather designed for the white-collar employees, while rotation for workers mostly ends at the boundery of the shop floor (Georg, 1994: pp. 180–181). Another problem of OJT is that it prevents inno-

vation and creativity, since it only transfers already existing experience knowledge (Eswein, 1987: pp. 197–198). Although the content of OffJT is broader than OJT, the goals are always the training of skills that are limited to the specific requirements of the respective car company. And further criticism argues that vocational training at Japanese auto makers only merely includes female and non–core workers, and that vocational training is only possible for the male core–workers after systematic selection by the superior, and not by their own initiative.

'Poly–qualification' in the Japanese sense only means the training of plant–specific operations during OJT. But skilled work in the German sense means qualifications which are of value for the worker also at the labor market, what results in a higher degree of independence from one single company and into a higher social prestige for the skilled workers. Consequently, the growing demand for specialists could create more independence from the company, and finally lead to labor markets for professionals outside the large companies. In opposition to the German situation, the importance of passing a vocational system before starting the working life seems to grow in Japan. The consequences could be a certain standardization of qualifications and the skilled workers' identification with a specific profession.

Summerizing chapter 2, we want to note that the vocational training at German automobile workers still seems to lack the training of extra–functional qualifications, which bear potentials to improve the productivity at the shop floor level. Here, too much energy seems to be focused on the training of functional skills, thereby ignoring or hampering the potential of socialization of the workforce. Whereas Japanese car makers, on the opposite, seem to be rather compelled to increase the attractiveness of assembly work. Here, too much efforts

seem to be spent on extra-functional qualification, thereby ignoring or hampering 'professionalization' to deal with the demands of more innovative production technology.

3. Social value change and vocational training

Vocational training is a strategy of companies to increase the productivity of their employees to achieve production to lower costs. Whereas the training of functional skills serves to cope with new production technologies, the training of extra-functional skills serve to create or preserve attitudes and values of the employees towards their work and company. Since social values and their changes affect the work values of employees, vocational training should react appropriately here.

3.1. Social value change in Germany and Japan

Value change means the change of socio-cultural values and value systems, which occurs in modern societies. Related with socio-cultural change, individual attitudes and evaluations, value orientations, and finally socio-cultural values are under a process of alteration (Hillmann, 1994: p. 932). The study of value change is about whether and in which direction people's thinking, feelings and behavior have undergone change, like e.g. in work attitudes (Trommsdorff, 1993: p. 63).

The change of values in Germany in the last three decades up to the present can be described as the increase of values towards individuality demanding independence and free will. The importance of socialization goals like obediance, orderliness, deference, frugality, and diligence has been decreasing. The values of political participation have been increasing, but the family has lost its traditional acceptance

giving way to alternative partnerships instead of marriage, and reduced power distance between men and women (Trommsdorff, pp. 66–68).

In Japan too, hierarchical attitudes have been changing. New behavioral alternatives and attitudes toward the self and the society have been developing. But here, individualism seems to be different from the German sense of individualism, since traditional Japanese attitudes like "filial piety" seem still to be very important. (Nishihara, 1993: pp. 52–53). There is a preference of discipline as an educational goal. Further, the egalitarian values concerning the status of women are weaker. Young Japanese also seem more materialistic than Germans and display weaker individualistic values of self-actualization (Klages, 1993, p. 200). Further seem Japanese youths to be less interested in active political participation and the pursuit of social responsibility (Trommsdorff, pp. 80–83).

But despite these differences the analysis of German and Japanese values, the "integrationist" who combines modern and traditional values seems to be the biggest subgroup of attitude profiles of individuals in both countries, labeled as the "crystal"-type. This type is cool against institutional structures, enjoys private life, and manages to unite tradition and modernity in an active way. He is able to establish a creative tension between himself as an individual and the institutions of the state and society (Klages, p. 204–207).

3.2. Influence on work values?

Work values largely determine work motivation, the contents of work education, the moral principles of work behavior and work organization, therefore the social structure of the work processes in general and their relation to other fields of activities in a society.

Consequently, there is a close relatedness between the work ethic and the overall moral principles of a society. (Hillmann, pp. 39–40).

Work values of Japanese youths have decreased and are now very similar to German ones (Trommsdorff, pp. 80–82). There are changes like the decrease of sense of responsibility, the decreased feeling of group belonging, and the decrease of loyalty towards the company (Muta, pp. 206–207). These post–materialistic and individual values in both countries, visible in a declining work orientation, can be seen as derogation of work morale, or as a change toward more flexible work attitudes. The increase in individuality and autonomy means an increase in individual responsibility, an increase in investment in education, raised expectations towards one's job and leisure time, or the decrease of social responsibiltiy and growing egoistic behavior, the decreased acceptance of external control, and the increased preference for non–institutionalized activities (Trommsdorff, pp. 68–71).

But it is questionable how far these overall value change in the society, or the "crystal type" of employee are affecting the work values of the individual employees in the company. And if they affect the work values, it is questionable how these changes affect the productivity of employees. Since the beginning 1980s for example, a value change into increased work satisfaction can be observed in West Germany, due to a shift from ruling political parties and economic conditions. Thus, work satisfaction reflects not only the individual evaluation of the present work, but is also influenced by socialization conditions in the given economic and political situation. (Trommsdorff, pp. 72–73).

The findings of comparative international studies to explain the success of Japanese LP in the automobile industry show that Japanese workers are much more productive by working longer, more and

better compared to their western collegues. But according to comparative research about work commitment, Japanese workers are less committed to work than their American counterparts, prefer leisure and family more than work, and also in 'job satisfaction' Japanese workers proofed even less satisfied than workers in western countries (Lincoln, Kalleberg, 1990: pp. 58–61). This contradiction of high productivity of Japanese automobile workers and their low commitment to work can only be explained by the interaction of technology and labor, guided by management. The workers' appreciation of long–term employment security, relative high income–levels, and the socialization processes in the companies seem still be able to neutralize a possible decline in work morale, stemming from an overall social value change into a more post–materialistic society.

Given political or economical conditions and management have an important influence on employees' productivity, even when work satisfaction or commitment seems to below. Nevertheless, the "humanization of work life" at German auto makers started as an response against changes of work values. Also, the intensity of socialization measures at Japanese car makers suggests that management is aware of different values outside the factories which could negatively affect the productivity of the Japanese workers.

4. Future vocational training at German and Japanese auto makers: Functional qualifications and extra–functional qualifications

After having discussed differences and similiarities in both countries, we see a mutual approach of the German and Japanese vocational training systems in the automobile industry to achieve skilled

workers. The "German model" of labor regulation revolving around the use of qualified skilled workers, and the "Japanese model" of group-oriented work regulation. The German model bases on the skilled worker and his specific understanding of skilled work as a 'profession'. This model's goal is qualified labor uncoupled from the production cycle and the machine pace to increase self-regulation and responsibility. The Japanese model of skilled worker also gives a central role to skilled labor, but coupled to the production pace of the assembly line. The allocation of personnel aims at the best possible performance and its permanent improvement, i.e., the continual intensification of labor. In the Japanese automobile industry, the work group is the starting point for an integrated job understanding, for the flexibilization and expansion of labor deployment, and for the qualification of the workers. Self-regulation thus is not based on skilled worker competences and a professional ethic.

Future competitiveness will be possible for those companies and production sites which will be able to effectively combine the development of human resources, new forms of group work and work efficiency. Here we see the possibility of an mutual approach of the Japanese and German models: Group formation, job integration and high labor efficiency in manual mass production according to the Japanese example and skilled-worker oriented team formation and professionalization in the high technology areas and in the service functions according to the German example (Jürgens et al., pp. 384-396).

Facing the competitive superiority of Japanese production organization and the "crystal type" of employee, the German car makers have to change the focus of vocational training from functional skills to more extra-functional skills. The productivity at the German shop floor could then be improved by lower estrangement between the

hierarchy levels and the flexibilization of technical skills. Japanese car makers, on the other side, seem also to be confronted with a "crystal type" employee, but also with the growing demand of professionalization of technical skills at the shop floor. They should therefore change their focus of vocational training from extra-functional skills achieved by thorough socialization to more functional skills.

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