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978-0-521-86752-8 - Skill Formation: Interdisciplinary and Cross-National Perspectives

Edited by Karl Ulrich Mayer and Heike Solga

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1 Skill Formation

Interdisciplinary and Cross-National Perspectives

Karl Ulrich Mayer and Heike Solga

TRENDS AND CHALLENGES

Changes in the demand for skills and qualifications in the workplace have been a constant feature of economies since the onset of industrialization. Shifts of manpower among the sectors of agriculture, manufacturing and services, changes in technology, increasing specialization, and growth in firm size and expansion of managerial control have also brought about changes in the vocational and professional skills required. In the twentieth century, broad social changes, such as the growing labor force participation of women and the ever-increasing level of educational enrollments, have been triggered by these varying demands for labor and have also strongly contributed to them. For a long time, the adaptation of vocational and professional training to these changes has essentially taken the form of extension (i.e., by increasing levels of participation at ever more advanced levels of general schooling) in early training periods for occupations both inside and outside the workplace and in further training. Mostly, such training concentrated in the late teens and then extended into the early if not mid-twenties. However, there was little change in that people made their longer skill investments for just one occupation and expected that these would serve them through most, if not even all, of their working lives.

In recent decades, the pressures for more and better skills have greatly intensified both in regard to the extent and kind of skill acquisition, especially in the so-called advanced societies in the West and their new Southeast Asian rivals (Bamber & Lansbury, 1998). Automation of production and services, as well as the outsourcing of manufacturing into low-wage developing countries, have left fewer skilled manual jobs and few unskilled jobs in advanced societies. Noyelle (1986: 106) stated, “The tendency is to automate low-skilled jobs and retain those jobs with relatively high skills.” As a consequence, skills

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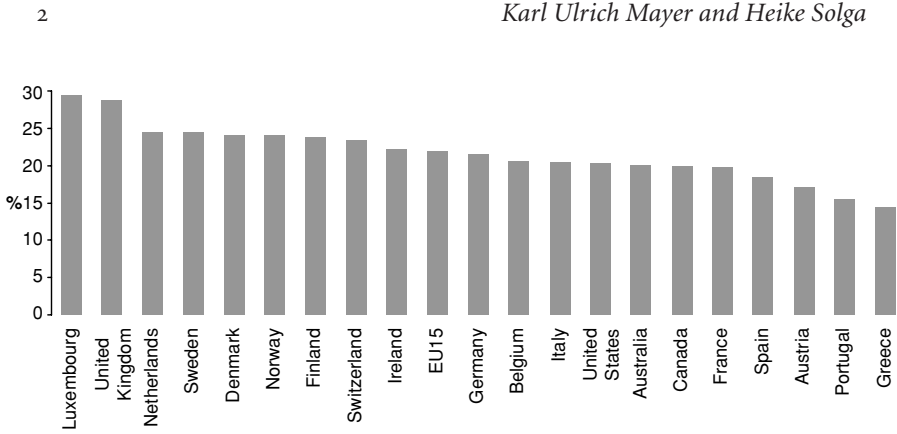
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Figure 1.1. Share of ICT-related occupations^a in the total economy, 2004^b. ^aBroad definition based on methodology described in OECD (2004) and van Welsum and Vickery (2005). The shares for non-European countries are not directly comparable with shares for European countries as the classifications were not harmonized. ^bAustria, Canada 2003 instead of 2004. *Source:* Organisation for Economic Co-operation and Development (OECD) (2004). Information Technology Outlook 2004, 8b. Share of ICT-related occupations in the total economy. Paris: OECD. Available at: <http://www.oecd.org/dataoecd/37/13/34963969.xls>.

have become the entry ticket to any kind of self-maintaining and productive life. Although the new information technology brought about a new breed of expert jobs and occupations in the 1960s and 1970s, information technology and computer skills have now become mandatory in all sectors and on almost all levels of the job hierarchy. In many countries, the share of (directly) information-communication-technology-related occupations already accounts for one-fourth to one-third of all jobs (cf. Figure 1.1). Skills have become a highly valued commodity in the new “knowledge society” and a strategic asset in the economic competition among nations.

This transformation of work has profound implications for the processes of skill acquisition in schools, in institutions of vocational training, and at the workplace. They relate to the substance of skills required, the timing of these processes across the life course, and the optimal interplay of the institutions involved in skill formation. The postulated consequences for the *kind of competences and skills* are assumed to include not only a shift away from more narrow job-specific skills toward broader, more analytic general skills, but also a move from hierarchically fixed activities to autonomous work in processual and cooperative work settings. For advanced societies, this implies an increase in the level of average skill requirements (coupled with the constant risk of polarization of skills), as well as a much more rapid turnover in the content and outcomes of training than in the past. It is also claimed

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that in addition to task-solving skills, social and emotional competences (so-called soft skills) have become more important as cooperative work groups, services, and management tasks proliferate (e.g., Murnane & Levy, 1996; Gallie et al., 1998; Giloth, 1998; Thurow, 1999).

Alterations in the *timing of skill formation* involve readjusting the relationship between schooling, initial training, and continuing education. Despite the transformations of the past few decades, schooling and initial vocational and professional training have retained their primary significance for occupational careers. To keep pace with the developments in the world of work (without implying even longer periods of education and training, but rather streamlining the process), the contents and temporal organization of schooling and training are under pressures to change. Initial and further education become more demanding, and skill formation starts even in preschool years (cf. Heckman, 2006). All too frequently, vocational training and skill enhancement are still concentrated early in the occupational career, and further training is based on an ad hoc and short-term logic of opportunities rather than on a systematic, lifelong learning approach. Moreover, further vocational training rarely serves a compensatory function; rather, it tends to widen skill gaps between groups, as the well educated at their demanding workplaces are well placed to invest in further skill acquisition. Finally, the aging working population, increasing life expectancy, and depleted pension funds mean that the 55- to-70-year-olds will have to remain in the labor market for a longer time and in larger numbers than in the past. The relationship between career paths, skill development, and skill maintenance across working life will thus become a key issue for employers and their (older) employees.

The institutional implications of these changes in the world of economy and work involve a paradigm shift away from jobs for life toward the flexible updating of occupational skills throughout the life course, as well as a move away from rigidly structured university and training courses toward flexible, modular systems based on cumulative credits and intermediate certificates. Such a modular training system could offer an opportunity to overcome the (artificial) segregation of various places of learning and instruction – schools, the workplace, and the community. Educational institutions require reforms and new financing solutions to counteract the existing discrimination and bias in public funding of education and to ensure that education as a civic right finally becomes a reality.

The urgent questions to be answered by the policy makers in advanced societies therefore are: How will it be possible to promote individual educational growth and motivation and to also improve the fit between developed

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skills and available jobs? How can the distinctiveness of learning and instructional settings – from schools to firms to communities – be combined to provide relevant opportunities to learn and develop skills needed for life and work? Which changes in educational provision and labor market reforms could effectively permit a more flexible use of the available human resources while taking into account legitimate expectations for access to further training?

One does not need to go far to find the empirical evidence for the urgency of reform addressing these questions. Almost all national governments have commissioned white papers and have introduced policy reforms in the area of skill provision. The Organisation for Economic Co-operation and Development (OECD) has greatly extended its attention to skill deficits and has taken several initiatives in the area of measurement and comparative assessment of skills and competencies. According to the Lisbon declaration of the European Council (in 2000), European countries want to become “the most competitive and dynamic knowledge-based economy in the world”²¹ – accompanied by the Copenhagen Declaration, which aims to enhance European cooperation in vocational education and training (VET). Among the European Union goals are a unitary framework of qualifications and competencies, common quality criteria and principles, and improvements in citizens’ access to lifelong learning (cf. Lisbon-to-Copenhagen-to-Maastrich Consortium Partners, 2004).

The academic literature has marshalled a great deal of arguments and evidence (some of which are partly controversial) to lend plausibility to this picture of changing demands and shortage of skills. Research on changes in occupational structures has consistently shown that long-term processes are characterized by trends of occupational upgrading and skill polarization (cf. Wright & Dwyer, 2003; Spitz, 2004). Economists have documented the skill bonus (i.e., the demand for higher skills as one of the reasons for increasing disparities in returns to education) (cf. Heckman et al., 2003, 2006; Beaudry & Green, 2005). The consequences of the computerization of workplaces on skill requirements have been forcefully argued by a group of Massachusetts Institute of Technology economists (cf. Katz & Krueger, 1998; Levy & Murnane, 2003a, 2003b).

OBJECTIVES OF THIS BOOK

Although the case for marked changes in the demand side of skill requirements has been made relatively convincingly, major questions about the processes of skill formation remain puzzlingly unresolved. A *first set of open*

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questions concerns the *institutions* where skills are being trained and learned. Advanced societies face similar competitive pressures on their economy and similar demands for highly skilled labor but have developed historically quite different institutional settings for providing skills. Thus, under which conditions of policy making and in which kinds of ensembles of various collective actors are training systems put in place, maintained, and developed? How important is the involvement of the state, trade unions, and employers' associations in shaping and regulating training systems? Are nations stuck with traditional institutions (e.g., Germany) or a lack of institutions (e.g., Britain, the United States)? What are the consequences of varying national systems and their path dependencies for the qualifications they are able to provide, and how well are they able to adapt to changing requirements?

A *second set of questions* raises the issue of *provision, access, and returns to training*, including questions on skill acquisition across the life course and the socioeconomic disparities that give rise to skill inequalities. These are some of the questions on skill formation in this area: How are qualifications, competencies, and skills transmitted, lost, and preserved? Are educational, vocational, and professional attainments just credentials that open access to more demanding and more rewarding jobs, or are they actually conditional for performance at the job? How useful is it to train for specific occupations if occupations are not for life? How meritocratic are skill formation regimes in advanced societies in terms of equality in educational opportunities? Do inequalities in education and training and their impacts on income and chances for promotion increase or flatten out across the working life? Finally, are market economies systematically underinvesting in skills, or under what conditions are firms prepared to invest in training?

The *third set of open questions* is connected to the "nature of the beast": *What do we mean when we talk about skills, qualifications, and competencies?* Of what kind and how many are there, and how can they best be measured? How do the aptitudes required at the workplace stand in relation to what we learn in schools? What are the best places to learn the qualifications one needs at work – the general educational system, vocational tracks and vocational schools, the workplace itself, or a combination of schools and the workplace, as in the German dual system of apprenticeships? Is the best way to train for occupational tasks to teach general competences and skills, or should one concentrate on highly specific vocational and professional profiles?

Given the salience of the topic, it is surprising how many of these questions seem to be settled more by strong convictions than by sound theory and basic research. The ongoing policy and academic debates are characterized by a high level of redundancy in describing the situation (e.g., increasing

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skill requirements, collapse of the German dual system) and buzzwords (e.g., “lifelong learning”), coupled with a limited empirical research base and even more limited theoretical foundations. We do believe that one major reason for this can be found in the way our knowledge about skill formation is currently organized. Academic approaches do not only tend to be segmented and isolated, but, consequently, are also characterized by the sometimes rather narrow perspectives of particular disciplines. They also hardly take much notice of each other. In addition, within academic disciplines, vocational training often plays the role of a greatly neglected child. It has received much less attention than general schooling and advanced professional training.

For this book, we wanted to bring together, therefore, specialists with expertise from various academic disciplines and from various countries. We asked scholars from educational psychology and vocational education science (*Berufspädagogik*), political science, economics, and sociology to contribute chapters. We asked them to specify, on the one hand, what the specific contributions of their disciplines are for the analysis of skill formation processes and, on the other hand, to present exemplary, preferably comparative research.

Besides these objectives, another major goal of the book is to inform about the *different definitions of “skills”* in these disciplines – aiming at supporting a better understanding across these disciplines and facilitating interdisciplinary research on skill formation processes in the future.

Political scientists came to the topic of skills through their interest in understanding the political and institutional foundations of national political-economic systems associated with divergent political and distributive outcomes. Therefore, political science has no definition of skills or competences, but only of skill production regimes or training institutions. This definition is derived from the main institutional goal *to train*, regardless of whether educational institutions actually train the skills they claim or are obliged to train.

Economists define skills as an individual’s *human capital*. In empirical research, this is mostly *indirectly* measured by educational degrees achieved or years of schooling. They are looking at training as a major process of *human capital formation* primarily under two micro-level perspectives. First, economists look at training as a personal investment into human capital. The yields to such investments are examined as differential returns to education. In a second perspective, they look at training from the point of the view of the employer and of the economy as a whole. They ask, on the one hand, under which conditions firms *do* invest in training and, on the other hand, whether their behavioral logics lead to an overall underinvestment in training that might have to be offset by public subsidies.

Sociologists, like political scientists, are concerned with institutional frameworks of skill acquisition, as well as their variation across time and among societies. Crucial institutions for sociologists include not only the educational system with the streams and curricula it provides for skill acquisition, but also the institutions that structure and regulate the labor market and influence the conditions of skill use. Differing from political science, sociological inquiry is not primarily concerned with the political processes establishing and maintaining skill formation regimes, but with the consequences different regimes have on individuals' life courses. In sociology, skills are recognized as institutionally defined and often credentialed bundles of work-related *qualifications*, frequently cast in the form of occupations and professions. Analyzing the processes of the acquisition of qualifications and their use refer to (1) the access to skills and the "returns" they provide and (2) the institutions that set the conditions, in particular, in terms of opportunities, costs, and benefits of skill acquisition. In many respects, sociology in this area shares the interests and approaches of economists. But sociologists, more than economists, focus on the social inequalities that are transmitted by differential access and "returns" to education and training. Thus, they also consider a plurality of outcome dimensions (e.g., employment opportunities, class, status, income). Besides these substantive interests of sociology, its focus on *qualifications* – and not assuming that they are purely indicators of "skills and abilities," as economists do – has a major advantage for empirical research: qualifications can be assessed relatively reliably and at low costs in population surveys, and information on individual's qualifications can be taken from the administrative registers of institutions that provide education and training.

Finally, *psychology* considers skill formation as individual learning processes. This explains why most psychological research in the field of skill formation takes a microperspective, focusing on how individuals process information during learning, how they perceive stimuli, how they acquire, store, retrieve, and apply knowledge, and how they solve problems within their professional field. Accordingly, this discipline brings to the table a long-standing expertise in highly general and universal theories about learning. It should, therefore, be best equipped to answer questions about the relative advantages of training generalized competences or specialized skills and about the transfers from generalized competences to the solving of specific tasks. It should also help resolve the issue of whether vocational (and professional) training is best organized in classrooms, work settings, or mixed environments.

These differences in the disciplinary definitions of skills are one of the main sources for the difficulties or even the lack of interdisciplinary research

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on skill formation. Nonetheless, these differences in definitions should not be regarded as an insurmountable obstacle preventing researchers from taking notice of relevant research on skill formation in other disciplines and from participating in answering the cross-disciplinary questions mentioned previously. Because of this consideration and our complaint that the disciplines in the field of skill formation are segmented, the ordering of the chapters in the book does not follow a disciplinary approach. Instead, we use the cross-disciplinary framework of our previous questions, situating the chapters and their contributions within this framework.

**Part I: Cross-National Diversity in Skill Formation Regimes:
Origins, Changes, and Institutional Variation in Individuals’
Labor Market Placements**

Chapter 2 by Culpepper and Thelen considers contributions from the political science literature to understand the causes and consequences of cross-national diversity in training regimes across the most developed democracies. The recent surge of interest by political scientists in skills has developed as an offshoot of debates over distinctive “Varieties of Capitalism” (Hall & Soskice, 2001). Here, national skill formation models are linked to recent claims about how vocational education and training systems fit into broader national models of the political economy, which are argued to have important implications for a range of economic, social, and political outcomes. In these debates, those skill formation systems (or skill regimes) that have attracted the most attention are those, like the German one, that appear capable of reconciling high wages with high productivity via high skills and high value-added production. In their chapter, therefore, the authors pay particular attention to Germany, while situating that case in the context of a broader comparative literature on the origins, operation, and future of distinctive skill regimes. Culpepper and Thelen address three main issues in their chapter. First, they present an overview of the various typologies that have been devised to characterize cross-national differences in training systems and of arguments on the implications of these different, nationally specific models of skill formation. Second, they explore the origins of cross-national differences in training and skill formation systems, and ask how firm-based training and high-quality apprenticeships have survived in some countries while they faded away in others. To explicate their arguments, they explore briefly the origins and development of the German system, drawing out comparisons to Britain, the United States, Japan, and Denmark. Finally, the authors connect their findings to contemporary debates on the continued

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viability of distinct skill regimes and focus, in particular, on the question of the robustness of the German model against the backdrop of contemporary changes in national economies and world markets. Here, Culpepper and Thelen analyze the current strains on Germany's apprenticeship system and reflect on the extent to which this system can adapt to a new set of challenges, including the incorporation of eastern Germany and the rise of the service sector, as well as technological and other changes that have rendered training more costly by increasing the importance of broad-based theoretical training. One of the chapter's major contributions to the book is demonstrating how highly contingent the provision of skills is and that formerly efficient institutional solutions might actually impede adaptations to new sets of skill demands.

The variety of national institutional configurations of skill provision – discussed by Culpepper and Thelen – is often connected to the assumption that these configurations (or skill formation regimes) constrain what kinds of skills are available on the labor market. A contrasting view, however, emerges out of Hillmert's empirical comparison in Chapter 3 of skill formation in Britain and West Germany. Taking long-term historical trends into account, the two countries represent different types of skill formation regimes. Hillmert shows that these regimes can both adapt, although in different ways, to similar new skill demands. Based on longitudinal data from the British Household Panel Study and the German Life History Study, the chapter compares school-to-work transitions in Britain and West Germany. It pays particular attention to the differences in the institutional structures in which qualifications are formed and allocated in the two labor markets and their specific pathways to adapt to new skill requirements – becoming visible especially during the 1990s. Among the institutional differences considered by Hillmert are a relatively low degree of standardization and more on-the-job training in Britain, in contrast to the dominance of the dual system and vocational specificity in Germany. Varying involvement of collective actors has also led to differences in the level of trust associated with the provision and acceptance of skills. The chapter assesses the effects of formal qualifications on the quality of first jobs and the stability of early careers. The results of the empirical analyses show that differences in skill investment, labor market entry, and life course patterns can be observed. For instance, in Britain, criteria of timing, in addition to the hierarchical grading of educational tracks, have played a larger role for allocating entry positions; in Germany, substantive occupational skills and the level of qualifications have been important. However, comparison of these two cases clearly reveals that there have also been functionally equivalent solutions to similar problems, as well as more

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specific problems and different economic strategies. Looking more closely at the German case from a life course perspective, Hillmert illustrates the fact that young adults increasingly experience multiple episodes of education and training and, as a consequence, shift jobs. This side of skill formation trajectory is largely invisible in aggregate indicators. Moreover, for both training and labor market mobility, Hillmert is able to demonstrate how social class closure takes effect early and then cumulatively through later stages of the life course.

Part II: The Economics and Sociology of Skill Formation: Access, Investments, and Returns to Education

In Chapter 4, the economists Dustmann and Schoenberg evaluate why the German apprenticeship system works. Competitiveness and performance of national economies are inherently linked to the productivity of its workforce. Many countries consider training and education increasingly important for productivity and have therefore made attempts to improve their educational and training institutions. As a result, economists have investigated successful components of national educational institutions and how they might be adopted by other countries. In this context, the so-called German dual system or *German apprenticeship system* has received the most attention. It combines on-the-job training in private firms with formal, state-provided education at vocational schools. Whether apprenticeship-type training schemes can be successful in other national contexts is not evident, however. One important question is *who finances the scheme*. There is evidence that a considerable part of the skills workers acquire during their apprenticeship period are general rather than specific and that the employing firm pays partly for its acquisition. Simple models of human capital investment show that firms have no incentive to invest in general skills because workers can quit and use these skills with other employers. One reason why firms may nevertheless find it advantageous to train workers is wage compression (i.e., wages increase less with training than workers' productivity). In their chapter, Dustmann and Schoenberg discuss three reasons for wage compression: the complementarity between firm-specific and general human capital, asymmetric learning, and the influence of trade unions. They present empirical implications of each of these theoretical explanations and then provide some empirical evidence for Germany. The second important question for individuals' skill formation is who pockets the returns to enrolling in such training schemes. If returns are too low, potential trainees may not be willing to enroll in training schemes that pay lower wages than they could obtain as unskilled workers. The authors