

# CHAPTER 1

## ACADEMIZATION: A NEW PERSPECTIVE ON OCCUPATIONS

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### ABSTRACT

*Advanced education is often thought to respond to the demands of the economy, market forces create new occupations, and then universities respond with new degrees and curricula aimed at training future workers with specific new skills. Presented here is comparative research on an underappreciated, yet growing, concurrent alternative process: universities, with their global growth in numbers and enrollments, in concert with expanding research capacity, create and privilege knowledge and skills, legitimate new degrees that then become monetized and even required in private and public sectors of economies. A process referred to as academization of occupations has far-reaching implications for understanding the transformation of capitalism, new dimensions of social inequality, and resulting stratification among occupations. Academization is also eclipsing the more limited professionalization processes in occupations. Additionally, it fuels further expansion of advanced education and contributes to a new culture of work in the 21st century. Commissioned detailed German and US case studies of the university origins and influence on workplace consequences of seven selected occupations and associated knowledge, skills, and degrees investigate the academization process. And to demonstrate how universal this could*

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*become, the cases contrast the more open and less-restrictive education and occupation system in the US with the centralized and state-controlled education system in Germany. With expected variation, both economies and their occupational systems show evidence of robust academization. Importantly too is evidence of academic transformations of understandings about approaches to job tasks and use of authoritative knowledge in occupational activities.*

**Keywords:** Higher education expansion; professionalization; knowledge society; occupations; rationalization; academization of work

## 1. INTRODUCTION

Advanced education is often thought to respond to the demands of the economy, market forces create new occupations, and then universities respond with new degrees and curricula aimed at training future workers with specific new skills. Presented here is comparative research on an underappreciated, yet growing, concurrent alternative process: universities, with their global growth in numbers and enrollments, in concert with expanding research capacity, create and privilege knowledge and skills, legitimate new degrees that then become monetized and even required in private and public sectors of economies. A process referred to as *academization of occupations* has far-reaching implications for understanding the transformation of capitalism, new dimensions of social inequality, and resulting stratification among occupations. Academization is also eclipsing the more limited professionalization processes in occupations. Additionally, it fuels further expansion of advanced education and contributes to a new culture of work in the 21st century. Commissioned detailed German<sup>1</sup> and US case studies of the university origins and influence on workplace consequences of seven selected occupations and associated knowledge, skills, and degrees investigate the academization process. And to demonstrate how universal this could become, the cases contrast the more open and less restrictive education and occupation system in the US with the centralized and state-controlled education system in Germany. With expected variation, both economies and their occupational systems show evidence of robust academization. Importantly too is evidence of academic transformations of understandings about approaches to job tasks and use of authoritative knowledge in occupational activities.

The contributions in this book proposing academization of occupations share a common perspective on the effects of growing participation rates in universities and related postsecondary institutions, accompanied by the dual mission of these institutions to integrate training with an extensive capacity to generate new knowledge and accompanying ideologies about all things. Beyond merely increasing the share of an academically educated work force or development of narrow technique, the expansion of higher education induces a fundamental transformation of the world of work: The higher education expansion corresponds with a growing number of job positions and employment possibilities catering to the competencies of an educationally educated workforce. Additionally, many of these workers

have on average advanced general skills, and they also take specialized knowledge supported by more theoretical and abstract perspectives about their jobs. This is occurring predominantly through expansion of application-oriented degree programs in Germany and undergraduate majors and minors and graduate degrees in the US that are grounded in inter- and trans-disciplinary curricula in scientific or specialist expertise. This is a repeated phenomenon that results from the widely recognized cultural charter of the university to create and teach new knowledge. This is not to suggest that the academization perspective argues that advanced education makes for some kind of “super worker” in idyllic occupations or even greater effectiveness in jobs. The case studies will demonstrate, the process of greater academization of occupations does not come without some conflict with traditional ways of doing jobs, including greater complexity in occupations that may not be related to overall efficiency and possible arbitrary privileging of new ideologies about tasks and skills. Also, exposure to higher education does not have uniform influences on students, leading to some unexpected paradoxical trends. Yet, the process of academization is nonetheless transforming beyond market forces and was not predicted by traditional sociological and economic analysis of work and its social organization.

There are several reasons why the sociology of occupations requires a new perspective. First and, in our judgment, foremost is the lack of theoretical and empirical integration of the impact of the nearly two centuries long education revolution making formal education a central social institution of postindustrial society (Baker, 2014; Parsons & Platt, 1973; Vanderstraeten, 2015). Although aspects of education training for work have always been central to sociology of occupations, these tend to be mostly about just credentials and training instead of about the potential for a robust institution of education to influence origins and dimensions of occupations. Second, with its intense focus on individual characteristics of workers and inequality of race, class, and gender, only a small amount of the field has been applied to structural qualities of systems of occupations and historical change after industrialization (Abbott, 1993). The sociology of occupations has not kept pace with the impacts of a growing institutional autonomy of education nor the postindustrial dynamics of capitalism (Turner, 2006). Lastly, the study of professions and professionalism have dominated the sociology of occupations, and although predictive in the past, professionalization theory has not fared well under changing conditions. Academization is not intended to be an all-encompassing theory of occupations, but it does provide a much-needed new perspective on the worn-out notions of overeducation, credentialism, supposed unresponsiveness of systems of higher education, and on the traditional perspective on professionalization of occupations.

At the same time, economic studies of labor markets and some applications of human capital theory to occupations have similar limitations. For the most part, origins and content of occupations are not problematized within a simple supply and demand framework. Also, the economic perspective assumes a one-sided relationship between education and jobs, with the former responding to the latter. This notion is then simply extended to growing advanced education: market forces create new occupations and then universities respond with new degrees and curricula

aimed at new workers with skills. Against such an assumption, this book provides an alternative reading. The relationship between institutionalized providers of advanced knowledge – higher education institutions – and the world of work is characterized by a complex and multidirectional process that takes its origin in the university. And particularly over the past 50 years, the proportion of the world's youth attending universities and related forms of postsecondary education have reached unprecedented levels, which means that compared to earlier generations of workers, high proportions of future workers will have had exposure to advanced education, witnessed and influenced by knowledge production, and have been inculcated into an extensive academic culture.

The traditional sociology and economics perspectives fall short largely because of the challenge that four empirical trends present in the contemporary study of occupations in these countries and elsewhere. A description of these trends, their challenge to traditional theory, and how an academization perspective helps to explain each follows a definition of academization and a summary of the case studies. But to summarize the trends: First is rapid expansion of higher education leading to significant increases in the pool of workers with advanced education. And, of course, this expansion paralleled the growth in universities and other postsecondary schools in both countries. Second is the fact that this did not result in an oversupply of educated workers driving down wages. Instead, there is a trend of a counterintuitive rise in demand with a higher wage premium for these workers in labor markets of postindustrial economies. Third is the underappreciated capacity of higher education institutions for knowledge production, particularly in science, technology, engineering, and mathematics (STEM) and behavioral–social sciences. And fourth is the under realization of a much-anticipated prediction of extensive professionalization of occupations. Although there are other new transformations of work and dimensions of occupations, an academization perspective can explain why at least significant parts of these four trends are occurring.

## 2. EXPLORING ACADEMIZATION OF OCCUPATIONS

Put succinctly, *academization is a process by which more aspects of occupations, job content, and preparation are permeated by the full range of institutional products of formal education*. As mass advanced education increases, the number of occupational fields of action and jobs in work organizations tailored to college graduates also increases, but academization also represents a profound transformation beyond expanding enrollment. Advanced education actively socially constructs or reconstructs the culture of work in postindustrial society through its many products (Baker, 2014). First is knowledge production from its vast research conglomerate in STEM, behavioral, and social sciences, coupled with its legitimation to determine the best approaches to all types of human activities (Geiger, 2017). Second is its unique charter to create degrees and academic programs and curricular content based on new knowledge and epistemological privileging of rational, empirical methods (Frank & Gabler, 2006; Frank & Meyer, 2020). Third is the

range of mass higher education effects on students in enhancement of cognitive skills, attitudinal, cognitive frames from academic disciplines, worldviews, and their sensibilities (Pascarella & Terenzini, 2005). As education and its universities become a mature social institution, its capacity and social charter autonomously influences other social institutions such as the economy and occupational structure (Abrutyn, 2009). Academization is a process that can run parallel to or integrate with market forces, public sector requirements, and technological change but with independent, observable consequences. Along with the occupational cases in this book, mounting evidence point to a generative process changing the world of work, including creation of new occupations, changes within existing occupations, and the relationship between occupations and educational authority.

The collected chapters in this volume on the academization of occupations are the first of their kind and are meant to both explore the dimensions of the idea and critique its theoretical strengths and weaknesses. Each uses a historical lens on how products from the greater institutionalization of the university and higher education shaped a particular occupation. Annemarie Matthies' analysis of the occupations related to business information technology in Germany (known as information systems in the US) traces the growing confluence of post-World War (WWII) industrial interests and state planning within the higher education sector on the growth of related technical and management degrees and research in German universities. The case also demonstrates how in many ways a robust academization process was underappreciated, even though it was robust enough to contribute to a wide social construction of the value of information in economic and managerial activities. In a related case on business, Alexander Mitterle examines the long struggle but then rapid and mostly achieved academization of the idea of entrepreneurship (*Existenzgründung* or *Unternehmensgründung*) as central to economic progress with the accompanying belief that entrepreneurs can be, and should be, trained at the university. Focusing on Germany and using the comparative context of the American business school, the case finds that recursive developments between universities and state policy starting in the 1970s created not only new degrees and professorships but also fostered and rationalized the idea of entrepreneurship as a key component for the German economy. Shifting from business to education, Maryellen Schaub, Yuen-Hsien Tseng, and Yuan Chih Fu describe the long steady incorporation into American higher education of the training and conceptions of the occupation of teaching of very young children from nurturing care-giving to responsibility for cognitive and social development. To demonstrate the direct influence of the university research conglomerate, this chapter includes an analysis of the expansion of early childhood topics into over 18,000 scientific journal articles from 1956 to 2021. In the contrasting case of early childhood teachers in Germany, Annett Maiwald concludes that academization contributed to a habitus of distance from direct interaction with children, a diversification of tasks in daycare centers, and hierarchical processes of professional role differentiation. Christoph Schubert's chapter on educational therapists in Germany, who provide a range of services from psychotherapy to academic tutoring to school-age children, illustrates how academization is pushed by university-based scientific developments and the activities

of various professional organizations in this emerging occupation. Not yet state sanctioned, nevertheless this occupation is at the cutting edge of shifting families' redefinition of difficult and public academic challenges of their children to psychological issues amenable to therapy. David Baker's analysis of the occupation of architectural engineer demonstrates how academization of existing degrees and research fields in American universities created a hybrid of architectural design and engineering without extensive market or state forces over the 20th century. The chapter also examines how university training shapes on-the-job approaches and concepts about built structures and their use. Finally, Monique Lathan's and Manfred Stock's case on mathematics shows how academization expands a traditional university subject into more economic functions and occupations. Mathematics, of course, has been at the foundation of many human activities for thousands of years, but this case describes recent tightening between the subject and new advances in its application to a greater number of endeavors, and this originates in large part in the university research conglomerate.

As the cases reveal, the three main types of institutional products of advanced education are resources that can be tapped into in different combinations and at slower or faster rates of diffusion across universities and jobs. Many demonstrate how academization is enhanced by institutional entrepreneurs within and outside of higher education, and in some cases situated in two institutions at once. Most often, these are historical individuals, but sometimes, they can be organizations such as academic departments or faculties at specific universities. In the American cases, the state plays a modest role, while in the German cases, it is an integral factor that once interacting in the academic process can have considerable influence. Several cases show a recursive dynamic with ebbs and flows in the incorporation of dimensions of academization processes. Some of the cases were able to bring their analysis from academization to actual job content and importantly to the *habitus* and attitudes that inculcates actors in occupations. Read as a whole, the cases discredit older notions of contentless credentialism, overeducation, runaway professionalism, and a singular focus on power, all common in prior study of education and occupations. Academization has layered, complex consequences from prestige ranking and remuneration to market monetizing of occupations, to specific, skill attainment, job content, and the cognitive approaches of the workers in more academized occupations. Lastly, many cases note that the academization process unfolded without much explicit recognition of it. This is likely because theorizing about academization goes against the usual assumption that education as an institution follows other institutions by arguing instead that a maturing education revolution creates greater institutional autonomy that in turn has major social constructive power (Baker, 2024).

### 3. ACADEMIZATION: CREATING CLASSIFICATIONS AND CONSTRUCTING NEEDS

Academization can be considered from an abstract sociologically perspective in several ways. Take, for example, one of the key institutional products of academization and the cultural power of the university to transform occupations – the

degree program. The expansion of applied degree programs in Germany and majors, minors, and graduate degrees in the US (hereafter just “degrees” from academic programs when discussing the general situation in both countries) reflects a logic of academization that implies a material and social classification. The degrees awarded on successful completion of academic programs do not just represent and classify the curricular study programs nor just the corresponding expectations in terms of a graduate’s abilities, competencies, and skills in a material sense. More significantly, they classify programs as an adequate and appropriate basis for performing specific practical tasks, providing services, and solving practical problems (Baker, 2014; Stock, 2005). As such, academic degrees also classify responsibilities for specific occupational fields and the working capacity of the graduates produced by universities. Although older sociological thinking about the growing centrality of academic degrees as occupational credentials dismissed it as a valid process because it could be shown that some occupations used these as entrance boundaries. Similarly, some economic reasoning also dismissed this phenomenon as a kind of credential inflation without corresponding skill enhancement. Both arguments, however, do not stand up well to increasing evidence that a combination of educationally enhanced cognitive functioning and specialized knowledge, gained by degree competition, is far more than boundary maintenance by contributing to human capital stock, productivity, wage differentials, and an education-oriented reordering of the occupational hierarchy and hence the stratification system in the US (Acemoglu, 2012; Baker et al., 2024; Goldin & Katz, 2008; Hanushek et al., 2015; van Noord et al., 2019). Degrees also classify and reclassify areas of professional responsibility and, hence, also employment positions. Such classifications do not primarily stem from the world of work and do not relate to professional experience; instead, over the long course of the university, they emerge from an academic process of knowledge production, redefining cultural ideas, and institutionalizing these with new areas and degrees in both countries examined here (Baker, 2011; Stock, 2017).

The significantly contrasting country cases also add important sociological breath to the argument by highlighting the institutional forces from within national education systems that can influence dimensions of academization of occupations. Following the liberal arts tradition of Anglo-Saxon universities, the US exemplified a loose relationship between degree content and job positions, while in Germany, this relationship is more tightly coupled compared to other developed countries (DiPrete et al., 2017). The traditionally self-regulating nature of the US higher education system shows a strong reactivity toward student (market) demands – as visible in the enormously expanding enrollment numbers in business degrees since the 1980s – but lacking centralized structures of correspondence between distinct degrees and job positions, curricular development derived primarily from advancements in the respective research fields as well as the contestation of degree-based hierarchies through differentiations and niche building (*cf.* Rawlings et al., 2012). In the German case, a close integration of university degrees and state jobs means that curricula are highly regulated and standardized through enrollment regulation, enforcing formal inelasticity to changing demands. Rising demand – also visible in business administration degrees – led



to overcrowding and an informal responsiveness to changes in research trends (*cf.* Mitterle, 2018). Resulting from the Bologna process, some of Germany's restrictive regulations were abolished in the early 2000s, and in their place, new degrees on a large scale were crafted and differentiated although still in regard to projected occupational fields more than student demand.

In each country, degree classifications are combined with social classifications derived from the stratified educational structure. The historical basis for this is the social mechanism of the authorization system rooted within education as an institution (Matthies & Stock, 2020). This mechanism defines academic qualifications and occupational fields (such as public posts) as corresponding to each other in material and social terms, thus institutionalizing the corresponding expectations in relation to the material orientation of degree programs, the definition of positions within organizations (Stock, 2016), and the allocation in Germany and popularity in the US of graduate positions.

The academization process also includes a rationale of constructing and expanding demands and need for new jobs and occupations. As several of the cases show, the academic world is increasingly classifying issues and human problems as requiring authoritative intervention of both high and low technological dimensions (e.g., psychotherapy and engineering). Also, an expanding academic community constructs demand for new skills and services in specific occupational fields. This is accompanied by growth in the number of graduates and is superimposed on a logic of upgrading based on current knowledge systems. The institutionalization and legitimacy of these knowledge systems can primarily be attributed to the fact that the school and university system, which is based on academic curricula, has developed into a system of education for all children and youth within an autonomous institution. Thus, knowledge and competencies that can draw on scientific (i.e., all kinds of science including behavioral and social sciences) evidence are valued more highly than those that are derived from generalizations based purely on experience or outdated knowledge. When graduates with academic qualifications are available and lay claim to occupational areas of responsibility, this devalues the knowledge base of those who have previously occupied these roles. In terms of both construction of new occupational and work categories to meet new social needs, the academization argument reconceptualizes the relationship between university education and employment away from outdated historical social and material classifications.

### *3.1. Empirical Trend 1: Growth of Postsecondary Education*

The first of the three empirical trends motivating theorizing about occupations and work with the academic argument is the exceptional increase in supply of postsecondary education and demand by ever larger portions of families and their children. This, of course, is a worldwide phenomenon gaining speed particularly since the middle of the 20th century and is based on an earlier expansion of upper secondary education, particularly in Western democracies (Reisz & Stock, 2007; Schofer et al., 2021). The expansion is a primary structural condition for academization, and the growth in demand for more educated workers



is an indication of the impact of academization on economies. Although the extent of increase in supply and demand of postsecondary education was unpredicted, early in the 1970s, the American sociologist Talcott Parsons coined the term “education revolution” and suggested that a growing formal educational sector, particularly with more attendance at universities, could be as important for emerging postindustrial society as the industrial and democratic revolutions had been for earlier liberal society (Stock, 2005; Vanderstraeten, 2015).

Growth in enrollment rate and the creation of more universities and colleges are well known. In higher income countries, Germany and the US included, this has been a trend for some time, and its cumulative influence on the human capital levels of the work force has been substantial. Fig. 1.1 shows this overall trend and the acceleration of advanced education enrollment in some countries indicating the growing intensification of an advanced education revolution. American and German adult populations experienced a significant increase in schooling over the past 80 years. The mean education attainment level of the US’ workforce went from lower secondary schooling (8th grade) in 1950 to completion of upper secondary schooling (12th grade) by 1980 and into postsecondary education for the rest of the period. Germany’s adult populations began the period at a lower mean level and then experienced rapid growth from 1980 with mean attainment

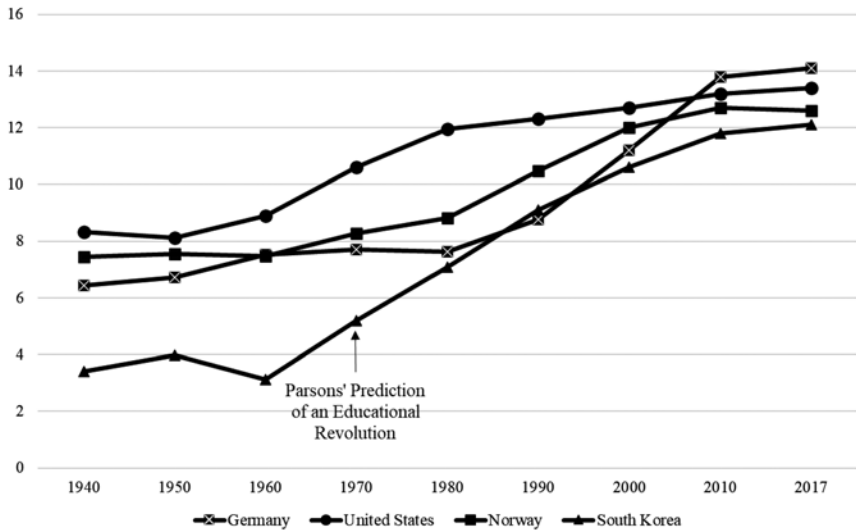


Fig. 1.1. The Mean Educational Attainment of Adult Population 1940–2017, Germany,<sup>a</sup> Norway, South Korea, and the USA.

<sup>a</sup> FRG only 1950–1990; data sources: Barro, R., & Jong-Wha, L. (2013). A new data set of educational attainment in the world, 1950–2010. *Journal of Development Economics*, 104, 184–198. United Nations Development Programme, Human Development Report (2018 Statistical Update). Mean number of years in school, repeated grades omitted for all countries.

reaching postsecondary approximately in 2000. And these two countries are not exceptional in this respect, for example Norway’s expansion of advanced education was earlier but, similar to the German pattern and South Korea, represents accelerated development from a much lower start, a pattern that occurred in many countries.

Although the US preceded Germany in mass advanced education, in many ways, the expansion in Germany illustrates the power of the ideas and development of the education revolution. Like most countries, German higher education is regulated and financed by the state. While individual state governments (Bundesländer) provide basic funding and control, the federal government finances research and teaching grants. State governments accredit universities, regulate admissions, and set and monitor enrollment quotas and related organizational targets. Public universities are entirely government financed, and no tuition fees<sup>2</sup> are charged, not even at the cost-intensive research universities. There have been repeated attempts to influence the expansion of higher education participation through higher education policy, for example, in the frequent calls on universities to orientate their educational programs to the need for skills and qualifications required by the economy (Mitterle & Stock, 2021). Nevertheless, the country was the first to open its universities to a wider array of society in the 19th century and has steadily increased in students and student quotas, as well as graduates and graduate quotas (except for the WWII years) (Windolf, 1997). Between the end of the 19th century and 1933, the quota and number of students rose steadily (Titze, 1987). As Fig. 1.2 illustrates, higher education greatly increased in the post-WWII period, particularly from the 1970s onward: The quota of first-year students rose 10-fold from around 5% in 1950 to 56% in 2021 (Destatis, 2022).

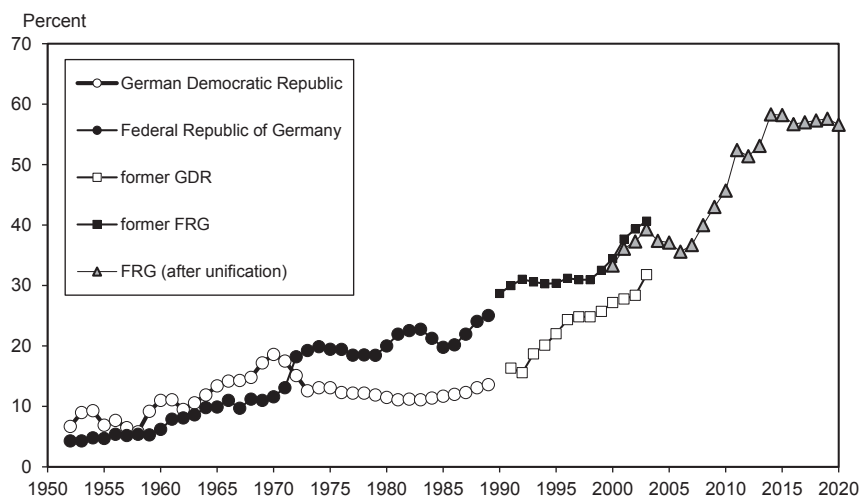


Fig. 1.2. Annual Enrollment Rates in Postsecondary Education in Germany (1952–2020).

Across curricula, applied degree programs have increased in number and significance (Reisz & Stock, 2011; Stock, 2024). Lastly, greater enrollment means more university graduates, which increased from about 140,000 to 490,000 students annually from the 1980s to 2018 (Autorengruppe Bildungsberichterstattung, 2022; Destatis, 2016).

Even with this history of growth, Germany is still below average in postsecondary education participation compared to other wealthy countries. What is telling, however, about this growth is that what did expand occurred in a national system with factors that resist expansion. First and primarily is the central position of research universities within the German higher education landscape and the regulations which govern access to them. Modern research universities were first established in Germany at the end of the 18th century. In contrast to many other countries, higher education in Germany is still characterized by public research universities of equal ranking, and most students in higher education are enrolled in these institutions (Bloch & Mitterle, 2017; Stock, 2017); 60% of all higher education students in Germany study at research universities, institutions that seek to maintain research-related teaching on both bachelor's and master's degree programs (Destatis, 2022). Albeit slowly decreasing, this is an exceptionally high proportion in comparison to other countries. Second, access to universities is predominantly<sup>3</sup> granted based on the *Abitur*, the German high school diploma, rather than an entrance examination.<sup>4</sup> Within the three-tier German secondary school system,<sup>5</sup> this qualification is obtained at a *Gymnasium*, a grammar school with a propaedeutic academic focus. Admission to and successful graduation from a *Gymnasium* are still decisive transition points within the school system, and they determine future access to higher education. Although the quota of pupils and graduates from *Gymnasien* has increased in recent years and alternative pathways to higher education have been opened, gaining access to the *Abitur* exam or equivalent forms of access entitlement still present a considerable barrier. Furthermore, in the case of Germany, it is significant that students who are not accepted to a *Gymnasium* attend a lower secondary school (*Realschule* or *Hauptschule*) which entitles them to participate in dual vocational training. The dual system involves a combination of learning through in-company training and at a vocational school<sup>6</sup>; this provides an alternative training path that also leads to well-paid employment. The dual vocational training system and the exemplary qualified skilled workers it symbolizes have up to now been regarded as a “backbone” of the successful “German production model” (Dörre, 2001; Kern & Schuhmann, 1998, translated by authors). The status of the dual vocational training qualification is still instrumental in reducing the demand for education and training at *Gymnasien* and universities. However, its attractiveness has been decreasing significantly with the number of new university enrollments exceeding those contractually entering dual education for the first time in 2020.<sup>7</sup>

Decentralized with low federal government involvement in education, the American system lacks resistance to expansion. Unlike Germany and many European countries, the US never relied on streaming high proportions of youth into vocational, nonuniversity training (e.g., Powell & Solga, 2011). Therefore, near inelastic demand for postsecondary education accrued from this unique and comparatively early expansion of secondary education. At the beginning of the

20th century, only a small percentage of young adults enrolled in postsecondary institutions. As secondary education expanded after WWII, Americans pursued higher education in increasing rates at a variety of organizational forms, including community colleges, liberal arts colleges, public regional colleges, land grant universities, and private universities. Over a span of a few decades, higher education went from something for the privileged few to something that was approaching mass access – that is now attended by more than two thirds of a national cohort of young adults ([National Center for Education Statistics, 2005](#)). Culturally, this was driven by a symbiosis of access: youth had access to mass undergraduate education; decentralized actors had access to found universities; and universities had access to offer and create degree programs through flexible mission charters with little control ([Fernandez et al., 2021](#)). Despite the “unregulated” growth and wide differentiation, like in Germany, higher education enrollment rates have increased in the growing number of research-intensive universities: in 1998, only 28% of students enrolled in doctorate-granting institutions; in 2020, these institutions accounted for 41% of the gross enrollment.<sup>8</sup>

In both countries, expansion of upper- and postsecondary has presented a challenge to sociological and economic theory about education and occupational systems. Discussions about “academization mania” and “over-academization” currently dominate the debate on German higher education policy as do assumptions about overeducation and credential inflation in the US (Bölling, 2013; Nida-Rümelin, 2015). Such arguments, however, do not stand up well to other trends about large numbers of young, educated workers and their role in a fundamental change in parts of postindustrial economies.

### *3.2. Empirical Trend 2: Counterintuitive Labor Market Reaction*

In both countries, the persistent growth in people with postsecondary degrees did not result in a decline in demand and wages. Indeed, there is a trend of better employment opportunities in Germany and a trend of undergraduate degree premiums in wages in the US. Both have been described as counterintuitive and as such are a challenge for academization to be taken as something beyond overeducation or runaway credentialism. The evidence, however, points to the need for considering academization.

In Germany, the expansion curve of student numbers and the annual increase in the number of university graduates could give rise to concerns that the employment situation for graduates would suffer from educational inflation. Yet there is little empirical evidence to suggest that the growth in employment positions for graduates cannot keep pace with university expansion. The available studies tend to indicate the opposite by confirming the remarkable capacity of occupational fields to absorb graduates. Since 1975, when comparable data on unemployment rates according to qualification groups first became available, the rate of graduate unemployment has never exceeded 5%. Despite a steady increase in student numbers, since 2008, the rate has hovered at around 2.5% and currently stands at 2.2% ([Bundesagentur für Arbeit \(Federal Employment Agency\), 2019](#); [Reisz &](#)

Stock, 2013). However, there are significant differences between unemployment rates for graduates in comparison to other qualification groups, such as skilled workers with vocational qualifications, or for those with no vocational qualifications. Furthermore, the disparity between these three groups has widened over time (Klein, 2015).

This divide in the German labor market is often viewed as evidence of a “crowding-out” effect where over the course of university expansion, graduates have successively displaced other qualified groups from their “established” positions (Drexel, 2012). At the same time, this implies a systematic devaluation of higher education qualifications, which impacts on a growing number of graduates. This corresponds with the theory that university graduates experience “over-education” implying that they receive a level of education that is considerably higher than the qualifications they require in their employment positions (Büchel & Mertens, 2004). Numerous studies, however, have undermined these hypotheses. For example, micro-census data from the 1970s (LaBnig, 1981), 1980s, and 1990s (Reinberg, 1999) has been used to demonstrate that there were no crowding-out effects despite higher education expansion, and labor economic analyses have not indicated any oversupply of highly qualified individuals who are displacing low-skilled workers and are willing to accept a lower income than expected for their level of qualification (Bellmann & Gartner, 2003). In fact, more recent time series analyses for 1984–2008 have shown just the opposite: The pay gap between different qualification groups has increased (Möller, 2011; Müller, 2001). There is no indication that graduate employment conditions have been downgraded not only in Germany but also in other countries experiencing similar expansion of higher education (Barone & Ortis, 2011; Leuze, 2010; Oesch, 2013; Wolter & Kerst, 2015). Also, despite university expansion, graduates’ positioning within the hierarchical structures of companies and organizations has either remained unchanged or worsened only slightly (Fabian et al., 2016; Klein, 2016; Reisz & Stock, 2012, p. 31). And even the Bologna process higher education reforms, which led German university to convert to bachelor’s and master’s degree programs, have not led to a devaluation of this qualification in comparison to the three-year dual vocational training system (*cf.* Mitterle & Stock, 2021; Neugebauer & Weiss, 2018).

A similar story emerges in the US and other countries known as the “Bachelor’s degree (BA) wage premium” in which wages have not deteriorated and often increased for workers with advanced education even though their numbers in the labor market have grown (e.g., Blundell et al., 2022; James, 2012). As in Germany, analyses of American workers find greater inequality in hierarchies of occupations by educational degrees and advanced cognitive skills learned in those degree programs (Baker et al., 2024; Hanushek et al., 2015). Also, increasingly occupations in the US correspond with specific skill requirements thus making tighter connections between advanced degrees and skills taught in the university while enhancing the value of specialized and portable advanced skills (Cheng & Park, 2020). And there have been several reasons put forth for why all of this has occurred. Skill-bias technological change theory argues that changes over time in technology increase the demand for new skills; a demand met though increased

human capital investments chiefly through formal education for at least some significant portion of jobs (e.g., [Acemoglu, 2012](#); [Lauder et al., 2018](#)). Also, others point to the additional factor of the change in the workplace brought on by educated workers and a restructuring of jobs and supervision (e.g., [Baker, 2014](#)). These earlier hypotheses are compatible with the broader notion of academization in explaining why the BA wage premium, and greater employment opportunities have emerged and indicate that economies react to the education level of workers in specific and broad ways. For example, recent analyses of new big administrative data show that the largest university premiums are found among degrees in STEM and other technical fields, many of which are linked to specific occupations originating through the academization process ([Britton et al., 2020](#)).

### *3.3. Empirical Trend 3: The Expansion of the University Research Conglomerate*

Even though by 1980, STEM research had grown substantially, science observers predicted that science could not continue to grow. Since then, science, reflected by the number of journal papers of new discoveries, has doubled many times, and approximately 2 million research papers now appear annually. The reason for the mistaken predictions of an end to growth was an underappreciated role of expanding universities and their research conglomerate. Currently, 85%–90% of all STEM+ papers include a university-based scientist, and most of these papers are authored solely by university scientists. The spread of what is known as the university-science model has led to universities worldwide cross-subsidizing research by teaching and awarding degrees, and with the education revolution's progress to mass university training, the world's research capacity grew with it ([Baker & Powell, 2024](#); [Powell et al., 2017](#)).

What is called global mega-science is a clear indicator of the capacity of universities to produce new knowledge in science and other disciplines, which is one of the main ingredients for greater academization. And Germany and the US are at the forefront of this trend. By 1900, Germany already had 30 universities whose faculty were training new scientists and publishing a significant share of the world's STEM+ papers, while the 25% larger US would not have over 30 research active universities until the 1920s. Soon after which the US developed approximately three times the research universities. And currently, both countries' universities produce extremely high levels of research ([Dusdal et al., 2020](#)).

### *3.4. Empirical Trend 4: Why Academization Instead of Professionalization?*

In 1964, a sociologist published a paper with the provocative title “The Professionalization of Everyone?” ([Wilensky, 1964](#)). The question was not posed cynically. Indeed, the idea that occupations of all types could become profession-like marked the beginning of a “golden age” of the study of professionalization with its earnest assumption that this was the main sociological form that occupations would drift toward ([Ivana, 2021](#)). Hence, in the middle of the 20th century, the study of occupations was dominated by looking for

traces of professionalism and its presumed causes (Abbott, 1993). Nevertheless, a vast professionalization project never occurred within postindustrial occupation systems. Although some characteristics of professionalization did spread to a degree, what is happening to many occupations is far more complex and thus not well captured by a theory of professions applied liberally. The reason that this is not now widely acknowledged is limitations of theory at the time continue to persist. Theories of professionalization often leave out the impact of the education revolution on work and occupations. And when they include the relationship between higher education and the change of professional work in their arguments, they rarely empirically examine evidence on either the content of academic degree or work tasks. They also focus on the specific problems of action of special professions dealing with clients or on a presumed, but unsubstantiated, objective functional superiority of professions. Four main theoretical versions on the profession incorrectly predicted ubiquitous mass professionalization of work because of limitations that are partially corrected by a theory of academization of occupations.

The classical version focuses on describing traits and characteristics of existing professions with debate over the primacy of attributes and what comprises an abstract “true profession” (Carr-Saunders & Wilson, 1966; Marshall, 1939). Characteristics include salient knowledge, autonomy in training and certifying, high prestige and remuneration, fulfillment of core social needs and values, peer monitored, and autonomy from the market or state bureaucracies. Besides the fact that these characteristics, at least as a full package, have not spread widely across occupations, this is a theoretically limited approach. Professional and professionalism are much-used words in modern work culture but rarely is it meant to include the full set of traits or to the degree of an imagined true profession. Instead, in many cases, academization is what is occurring, which of course can include some forms of these traits but is not necessarily a shift to a classical profession. And while the study of professionalism did recognize advanced education, it did not recognize the full set of academization focused on the transformation of occupational fields through a recursive connection between the development of study programs and professional, semi-professional, and other fields of action.

The second version, the power approach, with some circular reasoning views professions primarily as occupations that have succeeded in obtaining a monopoly on certain professional services (e.g., Larson, 1977). From this perspective, many of the above noted characteristics of professions stem as the result of monopolization efforts or – in the case of professional ethics – as ideology that serves to secure the monopoly position of the profession (Derber et al., 1990). Much of the actual activities in jobs that are deemed as professionalized are not included in power analyses, and those that do include professional work consider its content primarily as the result of a struggle for jurisdiction (e.g., Abbott, 1993). Professionalization appears solely as a process of power redistribution in favor of certain professional groups, maneuvering them to a privileged position in a stratificational order. And this is the crucial point of view from which to consider all other characteristics of professions. They are seen as expressions of



that position or are invoked to achieve that position. Hence, academic credentials can be mostly contentless and have no substantive influence on work activities and attitudes other than as an occupational monopoly. Academization recognizes boundary maintenance by occupations yet considers how the full range of academic products – degree, learning, new knowledge – play a role in hierarchically structured work organizations and the definitions of jobs and their content.

A third version widespread in Germany – the action-structural approach – was developed in reaction to power analyses by assuming professions are a special class of problem-solving, client-oriented occupations (Oevermann, 2005). They are occupations involved in unique problem interpretation and solving by applying abstract and universal knowledge. Professions are differentiated from occupations that might include problem-solving mostly in a routine and narrow technical sense. Also, to be a profession, the application of scientific knowledge can only be achieved based on a working alliance with a client. This approach focuses solely on client-oriented professions that must deal with a specific problem of action. Academization does overlap with the action-structural approach in explaining growth in occupations adding jobs of unique problem identification and solving through gained knowledge. But unlike the action-structural perspective, academization is a broader process and does not require distinguishing which problem-solving are unique to professions. Also, academization recognizes that new knowledge flows from the university research conglomerate, hence occupations, even those with more classical professional characteristics, define problems and courses of action for solutions from this outside influence as much, if not more, than from traditional internal professionalization forces. As the case studies will show, beyond only narrowly defined professions many academized positions and jobs incorporate these activities, including in some cases a client-based mentality.

A final version on a theory of professions assumes that professionalization is mostly a process of rationalization: Science is the epitome of cognitive rationality, and therefore a scientific education is transformed into a rationalization of professional action (Parsons, 1971; Parsons & Platt, 1973). Rationality in this case is frequently paired with the notion of occupations earning higher moral value and best technical standards, leading to social progress or at least greater effective functioning of society (Carr, 2014). This presupposition became the basic narrative underlying mainstream sociology of professions but with the high cost of a lack of an empirical way to test this claim. The claim itself became a damaging tautology that eventually added to the decline in the study of professions. As discussed above, academization takes a nuanced view of rationalization of occupations. Certainly, parts of many of the cases here can be read as movement toward greater rationalizing often based on science from the university, but whether this yields objectively higher value, moral practice, and effective organization of occupations is an open empirical question that is examined in more detail below from the academization perspective.

Regardless of the version on professionalization, given that the much-predicted professionalization project did not generally occur, an academization process offers a less-restrictive theory of occupational change that includes some aspects of professionalization.

#### 4. HAS ACADEMIZATION RATIONALIZED AND LEGITIMATED OCCUPATIONS?

In various ways, the cases raise the question: What are the likely consequences of growing academization of occupations? In other words, does academization lead to more efficient work, more profits, and more social progress? And how does academization legitimate its influence on occupations? The concept of academization advanced here is not based on an assumed objective rationalization model. On the contrary, the criteria and viewpoints used to evaluate academized occupational practice as more effective are themselves produced within the academization process in relation to specific fields. These beliefs originate from the academic world and have emerged from academic research, scientific knowledge, and teaching based on that same knowledge. What is more, the resulting semantics are also used to describe and evaluate occupational practice beyond a university context. One of the weaknesses of the traditional sociology of occupations was its assumption of greater rationalization where new knowledge from universities is transferred to occupations in a linear and logically assured way. This older model forms the basis of influential theory on professions and modernization (Parsons, 1971; Parsons & Platt, 1973), as well as theories on postindustrial society (Bell, 1979), and knowledge society (Drucker, 1993).

Since these earlier formulations, it became clear that greater rationalization is not necessarily always synonymous with efficiency, profit, and social progress. Although the belief that they are highly interconnected is a fundamental attitude of postindustrial society. And, of course, such a widespread belief has its own consequences. Early work on rationalization of professions found that the actual content of an occupation shapes its ability to problem-solve rationally. It is true that an engineer can systematically test and explain the parameters of a structural solution using a deductive-nomological model of explanation based, for example, on scientific statements. Engineers deal with technology, that is, with simplifications that function and can operate with isolated links between cause and effect.<sup>9</sup> A technical solution cannot, however, be deduced from theoretical-scientific principles. Solutions must be *designed*, and design proposals cannot simply be based on theoretical knowledge (Simon, 1981). In contrast to engineering, client-centered graduate professions (i.e., psychotherapy) are not based on the premise that practical tasks can be engineered. They cannot, or only to a very limited extent, act on the assumption that it is possible to isolate and assign causal factors. Neither can it be assumed that there are clear links between causes and effects, and that the relationships between them can therefore be controlled on a theoretical-scientific basis. Theoretical models of learning often lack practical situations of interacting with pupils in a classroom setting. While medical practice can be substantiated by scientifically based general principles of diagnosis and treatment, doctors must also consider a patient's individual life history in order to be able to make a diagnosis and treat them appropriately; there are, however, no general rules which can be applied here. These brief examples illustrate the gap between theoretical knowledge imparted during academic studies and the professional expertise required to solve practical problems.<sup>10</sup> Further

differences between academic studies and professional practice are associated with this discrepancy, such as applicable social norms and standards of interaction, mechanisms and personal consequences of liability, and temporal parameters of conduct and decision making (Stock, 2024).

Related to rationalization and its outcomes is the question of how academic knowledge plus specific competencies, value orientations, and habitus socialization acquired in university studies assert legitimacy in the world of work. The widely believed legitimation process is one of scientization: Science-based knowledge obtained in university studies increasingly becomes the foundation for on-the-job action, a transfer model of knowledge. The cases on academization, however, suggest a more complex construction responsible for legitimation of academization.

It is important to keep in mind that historically university studies followed its own rules, known as scholastic method; a method in which the classic texts held authority and were taught following a systematic procedure of interpretation (Matthies & Stock, 2020). With the transformation to the modern research university, this form of scholarship in the interpretation of authoritative texts was successively substituted through an independent production of novel knowledge through research. Research-based knowledge then becomes foundational to academic teaching and learning. Degree programs and academic teaching develop according to epistemic rules of modern science, oriented toward social expectations and the progress of knowledge. Likewise, new degree programs that evolve as part of this transformation are organized along scientific disciplines in research (Pfeffer & Stichweh, 2015). Science-based knowledge is the subject of teaching in the university, and teaching and learning are characterized through autonomous examination of objects of knowledge, the training in basic methods of knowledge production and in state-of-the-art of theoretical knowledge of a discipline. The university draws on its own social precondition, its own forms of interaction and organization, its own expectations, as well as its own problems of action, and it has become the institutional platform for most scientific research since the turn of the 20th century (Baker & Powell, 2024). The extraordinary prestige of science-based institutions of higher learning, that is, the extraordinary prestige of the research university, provides for the legitimacy and distinctive qualification that the titles symbolize (Baker, 2014; Meyer, 1977; Schofer et al., 2021).

Here substantial differences in the educational expansion between the contrasting cases come into play. The German cases emerge from an integrated education system comprising higher learning and a dual education–vocational system with state control. Occupations and society have been schooled through functionally differentiated parts of the education system, adhering to different formational logics and types as well as bodies of knowledge. The US cases experienced academization on a level that distinctively subordinates nonacademic formational achievements to those of higher education institutions: The society has been overwhelmingly schooled by the higher education system.

Although all the authors of the cases acknowledge that rationalization is not some natural superior and legitimating process that is achieved through

academization, different national conditions frame the relationship among rationalization, legitimation, and work of occupations and how they can be assessed. Some German cases, most significantly visible in early childhood education as described by Maiwald, take on the question of whether academization leads to improving and rationalizing work, and their answer is critical of this assumption found in the older literature on professions. For them, the question of whether theoretical knowledge facilitates practical problem-solving in a professional context is thus resolved in the real abstraction of a degree title, guaranteeing the legitimacy of the specific qualifications symbolized by academic titles (Meyer, 1977). In German institutionalized nonacademic occupational formation practices, they see preconditions of the university as distinguished from expectations and problems of occupation-specific action outside of the university. Their interpretation of their cases problematizes a discrepancy between academic theoretical knowledge and experiential know-how in occupations, often structured through corresponding practices of the vocational education system. They argue that this difference should not be reduced to that of an intellectual or cognitive level; it should likewise not be reduced to the level of material and distinct knowledge frames and content. They go on to argue that in contrast to the social conditions that characterize academic studies in the modern research university, the demands that arise for action through factual interaction in distinctively state-organized occupational settings form a different environment. Hence, in the case of *Kindergartens*, early childhood theories are directed at reframing and substituting long-agreed-upon practices of childcare in the German case.

The US cases by Schaub, Tseng, and Fu and Baker in this book do not problematize the theory–experience divide as well as rationalization and its assumed outcomes. In the American environment, this may be the wrong question to ask about academization. They interpret their cases as a changing social construction of work moving from older forms, often heavily based in tradition and experience, to theory-based forms originating out of the academic process. They acknowledge the historical uniqueness of the university but also acknowledge its powerful transition of culture, including work, in a maturing education revolution (Baker, 2014; Parsons & Platt, 1973). In these cases, the academization process significantly influences how tasks are achieved and how their logic is legitimated in early childhood teaching and architectural engineering, two occupations in the US where increasingly more workers have basic and advanced postsecondary degrees. These cases indicate that earlier experiential ways of doing work were as socially constructed as are newer academized ways, but since the latter stems from the institutional products of the university, there are observable significant differences in knowledge applied to job tasks, required skills, dispositions (*habitus*), and competencies, and these flow into the legitimation of the academized occupation.

The German cases of entrepreneurship, business informatics, and learning therapy bridge the two national contexts. When there are little to no robust state organizations that continuously problematize academic knowledge, they show an academization process in Germany that is similar to the US. Although

these study fields experienced long periods of struggle in their development, with institutional products of the university they eventually specified, abstracted, and defined a distinct area of occupational life that was not very present before. These activities did exist, but academization has helped construct founding a company, structuring a company, and learning deficiencies as complex problems worthy of a dedicated occupation supplied by workers with advanced degrees and specialized knowledge without obstacles from the state.

As a whole, the cases introduce the process of academization of occupations to the sociology of occupations, work, and ultimately the social stratification of postindustrial society. More research will be required to address the issues raised by these pioneering analyses, as well as the contrasting views on specific occupations. The cases do make clear that without a theory of academization, many salient empirical trends of education, employment, worker skills, and advanced capitalism will remain underexplained.

## NOTES

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2. They charge only nominal administration fees per semester.

3. Eighty percent hold the Abitur (*allgemeine Hochschulreife*), while 20% have obtained a specified right to study in universities of applied sciences. Changes in regulation also allow highly qualified graduates of nonacademic practical formation programs (e.g., Master craftsmen) to study in select degree programs. In relative terms this number is, however, still below 1% annually.

4. Changes to admission regulation, however, have allowed universities to introduce further admission requirements if demand exceeds places available. Consequentially, an increasing number of degree programs – especially on graduate level – have put further prerequisites in place. On undergraduate level, the *Abitur*-grade, however, remains the dominant entry requirement.

5. In most German federal states, secondary-level education takes place in three types of secondary school: *Gymnasium*, *Realschule*, and *Hauptschule*.

6. The dual system is available at both secondary and tertiary levels. For further details about the German vocational training system see Solga et al. (2014).

7. [www.demografie-portal.de/DE/Fakten/ausbildung-studium-anfaenger.html](http://www.demografie-portal.de/DE/Fakten/ausbildung-studium-anfaenger.html)

8. Due to developments in US higher education, notably academic drift, the classification has been changed throughout the years. The enrollments can, however, be seen as comparable. Comparison based on [Carnegie Foundation for the Advancement of Teaching \(2001\)](#) and 2020 data updates retrieved from <https://carnegie-v1.e-wd.org/downloads/CCIHE2021-FactsFigures.pdf>

9. See [Luhmann \(2003, p. 97\)](#) regarding this technical term, which goes beyond the objective artefacts of “production technology”/a “production method.”

10. Literature on this issue offers a number of different interpretations: in relation to education, Luhmann and Schorr describe it as a “technology deficit” (1982); Schön refers to it in relation to all professions as the “limits of technical rationality” (1991, p. 37ff); Nicolai discusses it with regard to management as “applied science fiction” (2004); [Murphy and Nelson \(1984\)](#) use the term “idiosyncratic techniques.”

## REFERENCES

- Abbott, A. (1993). The sociology of work and occupations. *Annual Review of Sociology*, 19(1), 187–209. <https://doi.org/10.1146/annurev.so.19.080193.001155>
- Abrutyn, S. (2009). Toward a general theory of institutional autonomy. *Sociological Theory*, 27(4), 449–465. <https://doi.org/10.1111/j.1467-9558.2009.01358.x>
- Acemoglu, D. (2012). What does human capital do? A review of Goldin and Katz's *The Race between education and technology*. *Journal of Economic Literature*, 50(2), 426–63. <https://doi.org/10.1257/jel.50.2.426>
- Autorengruppe Bildungsberichterstattung. (2022). *Bildung in Deutschland 2022*. wbv Media.
- Baker, D. (2011). Forward and backward, horizontal and vertical: Transformation of occupational credentialing in the schooled society. *Research in Social Stratification and Mobility: A Journal of the International Sociological Association*, 29(1), 5–29. <https://doi.org/10.1016/j.rssm.2011.01.001>
- Baker, D. (2014). *The schooled society: The educational transformation of global culture*. Stanford University Press.
- Baker, D. (2024). Zur Theoretisierung der Bildungsrevolution in der post-industriellen Gesellschaft: Mythen, Fakten und die Akademisierung der Berufsrollen. In A. Mitterle, A. Matthies, A. Maiwald, & C. Schubert (Eds.), *Akademisierung – Professionalisierung*. Springer.
- Baker, D., & Powell, J. (2024). *Global mega-science: Universities, research collaborations and knowledge production*. Stanford University Press.
- Baker, D., Schaub, M., Choi, J., & Ford, K. (2024). Education: The great equalizer, social reproducer, or legitimator of new forms of social stratification? In M. Berends, S. Lamb, & B. Schneider (Eds.), *The Sage handbook of sociology of education*. Sage.
- Barone, C., & Ortiz, L. (2011). Overeducation among European university graduates: A comparative analysis of its incidence and the importance of higher education differentiation. *Higher Education*, 61(3), 325–337. <https://link.springer.com/article/10.1007/s10734-010-9380-0>
- Bell, D. (1979). *The coming of post-industrial society*. Basic Books.
- Bellmann, L., & Gartner, H. (2003). Fakten zur Entwicklung der qualifikatorischen und sektoralen Lohnstruktur. *Mitteilungen aus der Arbeitsmarkt- und Berufsforschung*, 36(4), 493–507. [https://www.researchgate.net/profile/Lutz-Bellmann/publication/5103076\\_Fakten\\_zur\\_Entwicklung\\_der\\_qualifikatorischen\\_und\\_sektoralen\\_Lohnstruktur\\_Facts\\_on\\_the\\_development\\_of\\_the\\_qualification-related\\_and\\_sectoral\\_wage\\_structure/links/0deec52f22d509c9c1000000/Fakten-zur-Entwicklung-der-qualifikatorischen-und-sektoralen-Lohnstruktur-Facts-on-the-development-of-the-qualification-related-and-sectoral-wage-structure.pdf](https://www.researchgate.net/profile/Lutz-Bellmann/publication/5103076_Fakten_zur_Entwicklung_der_qualifikatorischen_und_sektoralen_Lohnstruktur_Facts_on_the_development_of_the_qualification-related_and_sectoral_wage_structure/links/0deec52f22d509c9c1000000/Fakten-zur-Entwicklung-der-qualifikatorischen-und-sektoralen-Lohnstruktur-Facts-on-the-development-of-the-qualification-related-and-sectoral-wage-structure.pdf)
- Bloch, R., & Mitterle, A. (2017). On stratification in changing higher education: The 'analysis of status' revisited. *Higher Education*, 73(6), 929–946. <https://doi.org/10.1007/s10734-017-0113-5>
- Blundell, R., Green, D. A., & Jin, W. (2022). The UK as a technological follower: Higher education expansion and the college wage premium. *The Review of Economic Studies*, 89(1), 142–180.
- Bölling, R. (2013, May 24). Wohin der Akademisierungswahn langfristig führt. *Frankfurter Allgemeine Zeitung*. [Boelling\\_akademisierungswahn.pdf](https://www.faz.net/aktuell/feuilleton/bildung/boelling-akademisierungswahn-12323871-3.html) (bildung-wissen.eu)
- Britton, J., Dearden, L., van der Erve, L., & Waltmann, B. (2020). *The impact of undergraduate degrees on lifetime earnings: Research report*. Institute for Fiscal Studies (IFS). <https://doi.org/10.1920/re.ifs.2020.0167>
- Büchel, F., & Mertens, A. (2004). Overeducation, undereducation, and the theory of career mobility. *Applied Economics*, 36, 803–816.
- Bundesagentur für Arbeit. (2019, April). *Berichte: Blickpunkt Arbeitsmarkt – Akademikerinnen und Akademiker*. Bundesagentur für Arbeit.
- Carnegie Foundation for the Advancement of Teaching. (2001). *The Carnegie classification of institutions of higher education: A technical report*. Carnegie Foundation for the Advancement of Teaching.
- Carr, D. (2014). Professionalism, profession and professional conduct: Towards a basic logical and ethical geography. In S. Billett, C. Harteis, & H. Gruber (Eds.), *International handbook of research in professional and practice-based learning* (pp. 5–27). Springer.
- Carr-Saunders, A. M., & Wilson, P. A. (1966). *The professions*. Clarendon Press.
- Cheng, S., & Park, B. (2020). Flows and boundaries: A network approach to studying occupational mobility in the labor market. *American Journal of Sociology*, 126(3), 577–631.



- Derber, C., Schwartz, W. A., & Magrass, Y. (1990). *Power in the highest degree: Professionals and the rise of a new mandarin order*. Oxford University Press.
- Destatis. (2016). *Prüfungen an Hochschulen. Fachserie 11, Reihe 4.2*. Statistisches Bundesamt. [https://www.statistischebibliothek.de/mir/servlets/MCRFileNodeServlet/DEHeft\\_derivate\\_00033167/2110420167004.pdf](https://www.statistischebibliothek.de/mir/servlets/MCRFileNodeServlet/DEHeft_derivate_00033167/2110420167004.pdf)
- Destatis. (2022). *Bildung und Kultur. Nichtmonetäre hochschulstatistische Kennzahlen. Fachserie 11 Reihe 4.3.1*. [https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bildung-Forschung-Kultur/Hochschulen/Publikationen/Downloads-Hochschulen/kennzahlen-nichtmone-taer-2110431217004.pdf?\\_\\_blob=publicationFile](https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bildung-Forschung-Kultur/Hochschulen/Publikationen/Downloads-Hochschulen/kennzahlen-nichtmone-taer-2110431217004.pdf?__blob=publicationFile)
- DiPrete, T. A., Bol, T., Eller, C. C., & van de Werfhorst, Herman G. (2017). School-to-work linkages in the United States, Germany, and France. *American Journal of Sociology*, 122(6), 1869–1938. <https://doi.org/10.1086/691327>
- Dörre, K. (2001). Das deutsche Produktionsmodell unter dem Druck des shareholder value. *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 53(4), 675–704. <https://doi.org/10.1007/s11577-001-0105-3>
- Drexel, I. (2012). Gesellschaftliche und politische Folgen von Akademisierung. In E. Kuda, J. Strauß, G. Spöttl, & B. Kaßbaum (Eds.), *Akademisierung der Arbeitswelt? Zur Zukunft der beruflichen Bildung* (pp. 36–51). VSA.
- Drucker, P. F. (1993). *Post-capitalist society*. Oxford.
- Dusdal, J., Powell, J., Baker, D. P., Fu, Y., Shamekhi, Y., & Stock, M. (2020). University versus research institute? The dual pillars of German science production, 1950–2010. *Minerva*, 58, 319–342.
- Fabian, G., Hillmann, J., Trennt, F., & Briedis, K. (2016). *Hochschulabschlüsse nach Bologna. Werdegänge der Bachelor- und Masterabsolvent(inn)en des Prüfungsjahrgangs 2013*. Forum Hochschule DZHW Hannover.
- Fernandez, F., Baker, D. P., Fu, Y. C., Muñoz, I. G., & Ford, K. S. (2021). A symbiosis of access: Proliferating STEM PhD training in the US from 1920–2010. *Minerva*, 59, 79–98.
- Frank, D., & Gabler, J. (2006). *Reconstructing the university: Worldwide shifts in academia in the 20th century*. Stanford University Press.
- Frank, D. J., & Meyer, J. W. (2020). *The university and the global knowledge society* (Vol. 6). Princeton University Press.
- Geiger, R. L. (2017). *To advance knowledge: The growth of American research universities, 1900–1940*. Routledge.
- Goldin, C., & Katz, L. (2008). *The race between education and technology*. Belknap Press.
- Hanushek, E. A., Schwerdt, G., Wiederhold, S., & Woessmann, L. (2015). Returns to skills around the world: Evidence from PIAAC. *European Economic Review*, 73, 103–130.
- Ivana, C. (2021). “The good, the bad, and the ugly” of professions: Overview of the theoretical developments in the sociology of professions. *Interdisciplinary Description of Complex Systems: INDECS*, 19(1), 80–93.
- James, J. (2012). *The college wage premium. Economic commentary (2012-10)*. Federal Reserve Bank of Cleveland.
- Kern, H., & Schumann, M. (1998). Kontinuität oder Pfadwechsel? Das deutsche Produktionsmodell am Scheideweg. In B. Cattero (Ed.), *Modell Deutschland – Modell Europa: Probleme, Perspektiven* (pp. 85–97). VS Verlag für Sozialwissenschaften.
- Klein, M. (2015). The increasing unemployment gap between the low and high educated in West Germany: Structural or cyclical crowdingout? *Social Science Research*, 50, 110–125. <http://dx.doi.org/10.1016/j.ssresearch.2014.11.010>
- Klein, M. (2016). Educational expansion, occupational closure and the relation between educational attainment and occupational prestige over time. *Sociology*, 50(1), 3–23.
- Laßnig, L. (1981). Selbststeuerungsmechanismen in der Zuordnung von Bildungs- und Beschäftigungssystem: Veränderungen in den 70er Jahren. In H.-J. Bodenhöfer (Ed.), *Hochschulexpansion und Beschäftigung* (pp. 219–237). Böhlau.
- Larson, M. (1977). *The rise of professionalism: A sociological analysis*. University of California Press.
- Lauder, H., Brown, P., & Cheung, S. Y. (2018). Fractures in the education–economy relationship: The end of the skill bias technological change research programme? *Oxford Review of Economic Policy*, 34(3), 495–515.
- Leuze, K. (2010). *Smooth path or long and winding road? How institutions shape the transition from higher education to work*. Budrich UniPress.



- Luhmann, N. (2003). *Soziologie des Risikos*. De Gruyter.
- Luhmann, N., & Schorr, K. E. (1982). Das Technologiedefizit der Erziehung und die Pädagogik. In N. Luhmann & K. E. Schorr (Eds.), *Zwischen Technologiedefizit und Selbstreferenz* (pp. 11–40). Suhrkamp.
- Marshall, T. H. (1939). The recent history of professionalism in relation to social structure and social policy. *Canadian Journal of Economics and Political Science*, 5(3), 325–340.
- Matthies, A., & Stock, M. (2020). Universitätsstudium und berufliches Handeln. Eine historisch-soziologische Skizze zur Entstehung des “Theorie-Praxis-Problems.” In C. Scheid & T. Wenzl (Eds.), *Wieviel Wissenschaft braucht die Lehrerbildung? Zum Stellenwert von Wissenschaftlichkeit im Lehramtsstudium* (pp. 215–253). Springer.
- Meyer, J. W. (1977). The effects of education as an institution. *American Journal of Sociology*, 83(1), 55–77.
- Mitterle, A. (2018). How to make it in(to) management: The role of business education in changing career pathways in Germany. In R. Bloch, A. Mitterle, C. Paradeise, & T. Peter (Eds.), *Studies in global higher education. Universities and the production of elites: Discourses, policies, and strategies of excellence and stratification in higher education* (pp. 271–297). Palgrave Macmillan.
- Mitterle, A., & Stock, M. (2021). Higher education expansion in Germany: Between civil rights, state-organized entitlement system and academization. *European Journal of Higher Education*, 11(3), 292–311.
- Möller, J. (2011). Qualifikationsbedingte Lohnunterschiede. *IAB-Forum*, 1, 4–13.
- Müller, W. (2001). Zum Verhältnis von Bildung und Beruf in Deutschland. In P. Berger & D. Konietzka (Eds.), *Die Erwerbsgesellschaft* (pp. 29–63). VS Verlag für Sozialwissenschaften.
- Murnane, R. J., & Nelson, R. R. (1984). Production and innovation when techniques are tacit. *Journal of Economic Behavior and Organization*, 5, 353–373.
- National Center for Education Statistics. (2005). *Digest of education statistics*. [https://nces.ed.gov/pubs2001/proj01/tables/tableB\\_04.asp](https://nces.ed.gov/pubs2001/proj01/tables/tableB_04.asp).
- Neugebauer, M., & Weiss, F. (2018). A transition without tradition: Earnings and unemployment risks of academic versus vocational education after the Bologna Process. *Zeitschrift für Soziologie*, 47(5), 349–363.
- Nicolai, A. T. (2004). The bridge to the ‘real world’: Applied science or a ‘Schizophrenic Tour de Force’? *Journal of Management Studies*, 41(6), 951–976.
- Nida-Rümelin, J. (2015). Akademisierungswahn. Plädoyer für eine Umkehr der Bildungspolitik. *Forschung&Lehre*, 1, 16–18.
- Oesch, D. (2013). *Occupational change in Europe*. Oxford University Press.
- Oevermann, U. (2005). Wissenschaft als Beruf. *Die Hochschule*, 14(1), 15–51.
- Parsons, T. (1971). *The system of modern societies*. Prentice Hall.
- Parsons, T., & Platt, G. M. (1973). *The American university*. Harvard University.
- Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research* (Vol. 2). Jossey-Bass.
- Pfeffer, T., & Stichweh, R. (2015). Systems theoretical perspectives on higher education policy and governance. In J. Huisman, H. de Boer, D. Dill, & M. Souto-Otero (Eds.), *The Palgrave international handbook of higher education policy and governance* (pp. 152–175). Palgrave Macmillan.
- Powell, J., Baker, D., & Fernandez, F. (2017). *The century of science: The global triumph of the research university*. Emerald Publishing.
- Powell, J. J. W., & Solga, H. (2011). Why are higher education participation rates in Germany so low? Institutional barriers to higher education expansion. *Journal of Education and Work*, 24(1–2), 49–68.
- Reinberg, A. (1999). Der qualifikatorische Strukturwandel auf dem deutschen Arbeitsmarkt – Entwicklungen, Perspektiven und Bestimmungsgründe. *Mitteilungen aus der Arbeitsmarkt- und Berufsforschung*, 32(4), 434–447.
- Rawlings III, H. R., Kirch, D. G., Decrappeo, A., & Mcpherson, M. P. (2012). The real costs of research. *Science*, 338(6106), 467–468.
- Rawlings, C. M. (2013). Becoming what you are: The reproduction of organizational status orders in uncertain environments. *Academy of Management Proceedings*, 2013(1), 17486. <https://doi.org/10.5465/ambpp.2013.17486abstract>
- Reisz, R. D., & Stock, M. (2007). *Inklusion in Hochschulen. Beteiligung an der Hochschulbildung und gesellschaftliche Entwicklung in Europa und den USA (1950–2000)*. Lemmens-Verlag.

- Reisz, R. D., & Stock, M. (2011). *Wandel der Hochschulbildung in Deutschland und Professionalisierung*. HoF-Arbeitsbericht 06/2011. Institut für Hochschulforschung an der Martin-Luther-Universität Halle-Wittenberg.
- Reisz, R. D., & Stock, M. (2012). Wandel akademischer Bildung in Deutschland (1950–2002). In P. Pasternack (Ed.), *Hochschul- und Wissensgeschichte in zeithistorischer Perspektive*. HoF-Arbeitsbericht 04/2012 (pp. 28–32). Institut für Hochschulforschung an der Martin-Luther-Universität Halle-Wittenberg.
- Reisz, R. D., & Stock, M. (2013). Hochschulexpansion, Wandel der Fächerproportionen und Akademikerarbeitslosigkeit in Deutschland. *Zeitschrift für Erziehungswissenschaft*, 16(1), 137–156.
- Schofer, E., Ramirez, F. O., & Meyer, J. W. (2021). The societal consequences of higher education. *Sociology of Education*, 94(1), 1–19.
- Schön, D. A. (1991). *The reflective practitioner: How professionals think in action*. Routledge.
- Simon, H. A. (1981). *The science of the artificial*. MIT Press.
- Solga, H., Protsch, P., Ebner, C., Brzinsky-Fay, C. (2014). The German vocational education and training system: Its institutional configuration, strengths, and challenges (WZB Discussion Paper, SP I 2014-502). Wissenschaftszentrum für Sozialforschung Berlin.
- Stock, M. (2005). *Arbeiter, Unternehmer, Professioneller. Zur sozialen Konstruktion von Beschäftigung in der Moderne*. VS Verlag für Sozialwissenschaften.
- Stock, M. (2016). Arbeitskraft- und Stellentypisierungen. Organisationssoziologische Überlegungen zum Zusammenhang zwischen Bildung und Beschäftigung. In M. S. Maier (Ed.), *Organisation und Bildung* (pp. 73–91). VS Verlag für Sozialwissenschaften.
- Stock, M. (2017). Hochschulexpansion und Akademisierung der Beschäftigung. *Soziale Welt*, 68(4), 347–364.
- Stock, M. (2024). Bildungsrevolution und Akademisierung der Berufsarbeit. In A. Mitterle, A. Matthies, A. Maiwald, & C. Schubert (Eds.), *Akademisierung – Professionalisierung. Zum Zusammenhang von Hochschulbildung, akademischem Wissen und den Veränderungen in der Arbeitswelt* (pp. 215–253). Springer VS.
- Titze, H. (1987). *Das Hochschulstudium in Preußen und Deutschland 1820-1944. Datenhandbuch zur deutschen Bildungsgeschichte*. Vandenhoeck & Ruprecht.
- Turner, S. M. (2006). Mapping institutions as work and texts. In D. E. Smith (Ed.), *Institutional ethnography as practice* (pp. 139–161). Rowman & Littlefield.
- Van Noord, J., Spruyt, B., Kuppens, T., & Spears, R. (2019). Education-based status in comparative perspective: The legitimization of education as a basis for social stratification. *Social Forces*, 98(2), 649–676.
- Vanderstraeten, R. (2015). The making of Parsons's the American university. *Minerva*, 53(4), 307–325.
- Wilensky, H. L. (1964). The professionalization of everyone? *American Journal of Sociology*, 70(2), 137–158.
- Windolf, P. (1997). *Expansion and structural change: Higher education in Germany, United States, and Japan: 1870–1990*. Westview Press.
- Wolter, A., & Kerst, C. (2015). The 'academization' of the German qualification system: Recent developments in the relationships between vocational training and higher education in Germany. *Research in Comparative and International Education*, 10, 510–524.