HOW UNIVERSITIES TRANSFORM OCCUPATIONS AND WORK IN THE 21ST CENTURY

VOL

VES ON EDUCATION AND SOCIET

FIONAL PERSPECT

The Academization of German and American Economies

Edited by

MANFRED STOCK ALEXANDER MITTERLE DAVID P. BAKER

HOW UNIVERSITIES TRANSFORM OCCUPATIONS AND WORK IN THE 21ST CENTURY

INTERNATIONAL PERSPECTIVES ON EDUCATION AND SOCIETY

Series Editor: Alexander W. Wiseman

Recent Volumes:

Series Editor from Volume 11: Alexander W. Wiseman

Volume 15	The Impact and Transformation of Education Policy in China
Volume 16	Education Strategy in the Developing World: Revising The World Bank's
	Education Policy
Volume 17	Community Colleges Worldwide: Investigating the Global Phenomenon
Volume 18	The Impact of HIV/AIDS on Education Worldwide
Volume 19	Teacher Reforms Around the World: Implementations and Outcomes
Volume 20	Annual Review of Comparative and International Education 2013
Volume 21	The Development of Higher Education in Africa: Prospects and Challenges
Volume 22	Out of the Shadows: The Global Intensification of Supplementary Education
Volume 23	International Education Innovation and Public Sector Entrepreneurship
Volume 24	Education for a Knowledge Society in Arabian Gulf Countries
Volume 25	Annual Review of Comparative and International Education 2014
Volume 26	Comparative Sciences: Interdisciplinary Approaches
Volume 27	Promoting and Sustaining a Quality Teacher Workforce Worldwide
Volume 28	Annual Review of Comparative and International Education 2015
Volume 29	Post-Education-For-All and Sustainable Development Paradigm: Structural
	Changes with Diversifying Actors and Norms
Volume 30	Annual Review of Comparative and International Education 2016
Volume 31	The Impact of The OECD on Education Worldwide
Volume 32	Work-Integrated Learning in the 21st Century: Global Perspectives on the
	Future
Volume 33	The Century of Science: The Global Triumph of the Research University
Volume 34	Annual Review of Comparative and International Education 2017
Volume 35	Cross-Nationally Comparative, Evidence-Based Educational Policymaking and Reform 2018
Volume 36	Comparative and International Education: Survey of an Infinite Field 2019
Volume 37	Annual Review of Comparative and International Education 2018
Volume 38	The Educational Intelligent Economy: Big Data, Artificial Intelligence,
	Machine Learning and the Internet of Things in Education
Volume 39	Annual Review of Comparative and International Education 2019
Volume 40	Annual Review of Comparative and International Education 2020
Volume 41	Building Teacher Quality in India: Examining Policy Frameworks and
	Implementation Outcomes
Volume 42A	Annual Review of Comparative and International Education 2021
Volume 42B	Annual Review of Comparative and International Education 2021
Volume 43A	World Education Patterns in the Global North: The Ebb of Global Forces and
	the Flow of Contextual Imperatives
Volume 43B	World Education Patterns in the Global South: The Ebb of Global Forces and
	the Flow of Contextual Imperatives
Volume 44	Internationalization and Imprints of the Pandemic on Higher Education Worldwide
Volume 45	Education for Refugees and Forced (Im)Migrants Across Time and Context
Volume 46A	Annual Review of Comparative and International Education 2022
Volume 46B	Annual Review of Comparative and International Education 2022

INTERNATIONAL PERSPECTIVES ON EDUCATION AND SOCIETY VOLUME 47

HOW UNIVERSITIES TRANSFORM OCCUPATIONS AND WORK IN THE 21ST CENTURY: THE ACADEMIZATION OF GERMAN AND AMERICAN ECONOMIES

EDITED BY

MANFRED STOCK

Martin-Luther-University Halle-Wittenberg, Germany

ALEXANDER MITTERLE

Hamburg University, Germany

and

DAVID P. BAKER Penn State University, USA



United Kingdom – North America – Japan India – Malaysia – China Emerald Publishing Limited Emerald Publishing, Floor 5, Northspring, 21-23 Wellington Street, Leeds LS1 4DL.

First edition 2024

Editorial Matter and Selection © 2024 Manfred Stock, Alexander Mitterle and David P. Baker. Individual chapters © 2024 The authors. Published under exclusive licence by Emerald Publishing Limited.

Reprints and permissions service

Contact: www.copyright.com

No part of this book may be reproduced, stored in a retrieval system, transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise without either the prior written permission of the publisher or a licence permitting restricted copying issued in the UK by The Copyright Licensing Agency and in the USA by The Copyright Clearance Center. Any opinions expressed in the chapters are those of the authors. Whilst Emerald makes every effort to ensure the quality and accuracy of its content, Emerald makes no representation implied or otherwise, as to the chapters' suitability and application and disclaims any warranties, express or implied, to their use.

British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

ISBN: 978-1-83753-849-2 (Print) ISBN: 978-1-83753-848-5 (Online) ISBN: 978-1-83753-850-8 (Epub)

ISSN: 1479-3679 (Series)



For the late Robert D. Reisz, whose thoughtful ideas and enthusiastic collaboration helped launch this book. This page intentionally left blank

CONTENTS

List of Figures and Tables	ix
List of Abbreviations	xi
About the Editors	xiii
About the Contributors	xv
Chapter 1 Academization: A New Perspective on Occupations Manfred Stock Alexander Mitterle and David P. Baker	1
Chapter 2 The Academic Roots of Digitalization: How the University Shaped Work Processes in Companies Annemarie Matthies	25
Chapter 3 Educating Entrepreneurs: Long Path to Bloom in German Universities <i>Alexander Mitterle</i>	45
Chapter 4 All Roads Lead to the University: The Academization of Early Childhood Education Maryellen Schaub Yuen-Hsien Tseng and Yuan Chih Fu	85
Chapter 5 Educating from a Distance: Early Childhood Pedagogy in Germany – Institutional Pathways, Cognitive Values, and Current Effects in Child Day Care Practice Annett Maiwald	101
Chapter 6 Creating Educational Therapists in Germany: Achieving Recognition of the Profession Through Academization Christoph Schubert	131
Chapter 7 The Academic Origins of the Architectural Engineer: Design and Building as Practice of Theory <i>David P. Baker</i>	149

Chapter 8 The Expansion of Mathematics as a Discipline and an Occupational Field: Progress in Quantitative Modeling in	
Different Sectors of Society <i>Monique Lathan and Manfred Stock</i>	163

Index

193

LIST OF FIGURES AND TABLES

Figures

Fig. 1.1.	The Mean Educational Attainment of Adult Population	
	1940–2017, Germany, Norway, South Korea, and the USA.	9
Fig. 1.2.	Annual Enrollment Rates in Postsecondary in Germany	
	(1952–2020).	10
Fig. 4.1.	Training Timeline: University Absorption of Early	
	Childhood Education Training.	88
Fig. 4.2.	The Number of Child Development Publications by Year.	93
Fig. 7.1.	Growth in New AE Accredited Degree Programs at US	
	Universities, and Existing Programs, 1930–2019.	154
Fig. 8.1.	Relative Prevalence of Mathematics Study Programs in	
	Germany.	172

Tables

Table 4.1.	State BA and Certification Requirements for Prekindergarten	
	Teachers, 2001–2002 and 2018–2019.	91
Table 4.2.	The Distribution of Child Development Papers by Topic.	93
Table 7.1.	Selected Scientific Journals With Content on Research	
	and Theory Relevant to AE Training.	158
Table 8.1.	Comparison of the Quantitative Development of	
	Mathematics Graduates in the Labor Force in Germany.	173

This page intentionally left blank

LIST OF ABBREVIATIONS

ABET	Accreditation Board for Engineering
AE	Architectural Engineering
BABAG BEK	Bachelor of Arts Bundesarbeitsgemeinschaft Bildung und Erziehung in der Kindheit (roughly: Federal Association for ECEC)
BDP	Berufsverband Deutscher Psychologinnen und Psychologen e.V. (Association of German Professional Psychologists)
BIFOA	Betriebswirtschaftliches Institut für Organisation und Automation (Business Administration Institute for Organization and Automation, an applied research institute on organization and automation at the University of Cologne; it played a seeding role for both business information systems and entrepreneurship education)
BIS	Business Information Technology
BS	Bachelor's degree
COM	European Commission
DtA	Deutsche Ausgleichsbank (German State bank for the provision of securities to private bank loans for SME)
ECEC	Early Childhood Education and Care
EDP	Electronic Data Processing
EE	Entrepreneurship Education
FiL	Fachverband für integrative Lerntherapie e.V. (FiL, Professional Association for Integrative Educational Therapy)
ICT	Information and Communication Technologies
Ifm	Institut für Mittelstandsforschung (Institute for the Research of Small- and Medium-Sized Enterprises)
Ifo	Leibniz Institute for Economic Research at the University of Munich
KIM	Kölner Integrationsmodell (Cologne Integration Model, proposal for the development of an architecture for application systems in Germany)
MAE	Masters of Architectural Engineering

MAT	Mensch/Aufgabe/Technik-System (German term in business information systems explicating three components on which information systems depend: human, task, and technology)
MS	Master's degree
OECD	Organisation for Economic Cooperation and Development
PhD	Doctor of Philosophy
PISA	Programme for International Student Assessment
R&D	Research and Development
STEM	Science, Technology, Engineering, and Mathematics
UAS	Universities of Applied Sciences
WiFF	Weiterbildungsinitiative Frühpädagogische Fachkräfte (Further education initiative for personnel in ECEC)
WR	Wissenschaftsrat (German Science and Humanities Council, academic advisory body crafting policy recommendations for higher education)

ABOUT THE EDITORS

Manfred Stock is a Sociologist and Full Professor of Sociology of Education at the Institute of Sociology at the Martin-Luther-University Halle-Wittenberg. He received his PhD from the Humboldt University Berlin and completed the German postdoctoral Habilitation degree at the Free University Berlin. His research focuses primarily on the relationship between educational systems and society, currently on the transformation of academic occupations. He has published monographs on the development of the German education system, on the social construction of employment in modernity, on university expansion in an international comparative perspective, and on universities in the world society.

Alexander Mitterle is a Political Scientist/Sociologist at the Department of Social Sciences at the University of Hamburg. He was a Member of the Deutsche Forschungsgesellschaft (DFG) research group "mechanisms of elite education" and pursued research on higher education and social fields at the Martin-Luther-University Halle-Wittenberg and at the Institute for Small- and Medium-Sized Enterprise (SME) Research (ifm) at the University of Mannheim. He published on various aspects of higher education, including stratification, internationality, career pathways, admissions, private higher education, and academic time. Among his recent publications are "Devices of Future Excellence" (2022 with R. Bloch, *Research Evaluation*) and the special section on "the Politics of Size in Higher Education" (2022, with S. Robertson and R. Bloch, *Globalisation, Societies and Education*).

David P. Baker is Professor of Sociology, Education, and Demography at the Pennsylvania State University, where he directs international research on the worldwide education revolution's impact on science, global development, health, demographic regimes, occupations, and social stratification. His scholarship on universities and science received the 2023–2024 George Sarton Chair and Medalist in the history of science awarded by the University of Ghent, Belgium. In addition to publishing numerous technical scientific articles, he has authored *Global Mega-Science: Universities, Research Collaborations, and Knowledge Production*, Stanford University Press; *The Century of Science: The Global Triumph of the Research University*, Emerald Publishing; *The Schooled Society: The Educational Transformation of Global Culture*, Stanford University Press; and National Differences, Global Similarities: World Culture and the Future of Schooling, Stanford University Press. He is also a Visiting Professor on the Faculty of Humanities, Education & Social Sciences, University of Luxembourg, and a Non-residential Fellow at The Brookings Institution, Washington, DC.

ABOUT THE CONTRIBUTORS

Yuan Chih Fu is Associate Professor of the Graduate Institute of Technological and Vocational Education at National Taipei University of Technology (Taipei Tech). He received his PhD degree in Higher Education from the Pennsylvania State University (2017). Before making his transition to academia, he worked in Taiwan's Ministry of Education as a policymaker in higher education, dedicating his professional work to the construction of national data infrastructure and its application in higher education governance. With a dual identity of an empirical scholar and a policymaker, he translates knowledge into action, also as the Founder of the Taiwan Association for Institutional Research (est. 2015). His research focuses on the impact of educational policy on individual, higher education institutions, and society. His area of expertise is policy evaluation and quantitative research. His papers have been published in leading international journals (e.g., Studies in Higher Education, Higher Education, Journal of Higher Education, Higher Education Policy, Scientometrics, and Minerva). He received the distinguished Young Scholar Award at National Taipei University of Technology (2022) to honor his excellence in research.

Monique Lathan is a Research Associate at the Institute of Sociology at the Martin-Luther-University Halle-Wittenberg. She studied Rehabilitation Psychology at the University of Applied Sciences Magdeburg-Stendal. She was a Research Assistant at the Institute for Higher Education Research Wittenberg at Martin-Luther-University (HoF) and later at the Center for School and Educational Research, Martin-Luther-University Halle-Wittenberg. She received her doctorate on emancipatory subject theories from the Martin-Luther-University in 2020. The current focus of her research is studies on the expansion of higher education and academization of employment.

Annett Maiwald is Assistant Professor of Sociology of Education at Martin-Luther-University Halle-Wittenberg, Germany. After completing a Magister Artium (MA) in Sociology/Social Psychology from Leibniz-University Hannover, she obtained her PhD in Sociology from University Halle-Wittenberg. Her research focuses on early childhood education and care, notably questions of interactional relationships in educational organizations (kindergarten). From 2016 to 2020, she worked on higher education expansion and academization processes in pedagogical disciplines and on relating effects in educational practice. Since 2022, she is Project Leader of the Ministry-funded research project "Knowledge Transfer in the Field of ECEC" (BMBF), which examines the knowledge productions of pedagogy. It investigates how the higher education system attempts transfer its epistemic tools into practice and how this impacts on the occupational practice.

Annemarie Matthies is a Sociologist and Professor for Social Work at the IU Berlin (dual studies). She received her PhD from the Albert-Ludwigs-Universität Freiburg. As a Member of the DFG research project "Academization of Employment," she pursued research on the relation between academization and digitalization at the Martin-Luther-University Halle-Wittenberg. Her teaching focuses on the transfer of theory into practice, occupational change through digitalization, and developments in professional fields of social work. Her research addresses the digitalization of work, the transformation of social work, and the role of universities in the digital transformation.

Maryellen Schaub is a Sociologist of Education and Teaching Professor at the Pennsylvania State University. Her research includes several US and comparative areas such as the intensification of cognitive demands on young children, the cultural significance of education, and the expansion of child rights worldwide. Her new book is titled *Motherhood, Childhood and Parenting in an Age of Education: An Invited Invasion.* It is about the fundamental transformation of motherhood and childhood as education, our largest social intervention, grows in institutional strength, and the evolution of parenting to a more schooled and cognitively based developmental approach.

Christoph Schubert is a Research Associate at the Institute of Sociology at Martin-Luther-University Halle-Wittenberg, specializing in educational sociology. In addition to his work in higher education research, organizational sociology, and the digital transformation of society, his research focuses specifically on rural sociology and demographic change. He earned his doctoral degree at the Martin-Luther-University Halle-Wittenberg in the field of social structure analysis, with a research emphasis on coping with demographic change in small rural communities through the active involvement of civil society, local politics, and administration.

Yuen-Hsien Tseng received his MS and PhD degrees from the Department of Computer Science and Information Engineering, National Taiwan University, in 1989 and 1993, respectively. He has been a Fu Jen Catholic University Professor for 10 years since 1995. In 2005, he joined National Taiwan Normal University (NTNU) and was awarded as a Distinguished Researcher since 2011. Since 2021, he has been recognized as a career-long (1960–2020) World's Top 2% Scientist. In 2022, he became a Distinguished Professor at NTNU. His research interests include text mining, information retrieval, natural language processing, deep learning, education science, and their applications.