INTERNATIONAL AND DEVELOPMENT EDUCATION

Transformation of Higher Education in the Age of Society 5.0

Trends in International Higher Education

Edited by Reiko Yamada
Aki Yamada · Deane E. Neubauer

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Preface

The twelve substantive chapters that constitute this volume explore a range of activities within an array of higher education (HE) institutions, primarily in Japan, but with attention to some of its overall dimensions and implications for the conduct of higher education at the university level. Together they suggest how the Fourth Industrial Revolution and what in Japan has been framed as "Society 5.0" are affecting the existing structures of higher education and promoting new modalities for instruction, research, and community service. The vision of "Society 5.0" promoted by the Japanese government is one "where advanced technologies and service platforms integrate with and empower individuals in a human-based society" (MEXT, 2018). This proposal for the development of Japanese society and the economy suggests a STEAM approach to curricula might best provide the next-generation competencies needed to effect such societal change. At the same time, though, there has been a recent tendency by the Japanese government to dismiss the societal importance of humanities and social sciences both in policy statements and the censoring of expert voices in social science and humanities, which are critical of government policies. These events have had the unfortunate effect of further dichotomizing university campuses rather than promoting interdisciplinary approaches to the HE curriculum worldwide. But this phenomenon is not only applicable to Japan but also applicable to other Western and other Asian countries too. For instance, "I-Korea 4.0" (I for Intelligence, Innovation, Inclusiveness, Interaction, and 4.0 for the Fourth Industrial Revolution), and the "Taiwan Productivity 4.0 Initiative" implies the meaning of the society dealing with the Fourth Industrial

Revolution. We are obliged to explore how the Fourth Industrial Revolution and Japan's vision for Society 5.0 affect the existing structures of higher education and promote new modalities for teaching, research, and community service.

First, we explore various dimensions in which these dynamics will impact the conventional disciplines that constitute the social sciences. In our view, this leads to radically differentiated knowledge activities within these fields, and perhaps of even greater importance, the emergence of newly determined conjoint hybrid fields in which the traditional disciplinary boundaries that have separated such areas are progressively reduced. We aim to redefine the role of the university and the social sciences within the emergent structures of Society 5.0.

When we consider the impact on the knowledge economy in a globalized world, it has become increasingly prominent in recent years. There is a growing expectation and demand for innovation in higher education. The term "STEM" has become a dominant part of educational discourse, coined to recognize the widely recognized concept of integration between Science, Technology, Engineering, and Mathematics. Worldwide, it is generally expected that the STEM fields of study will take a leadership position in innovation. However, there is a recent trend of additionally integrating the arts into STEM studies under the "STEAM" moniker. We will argue how this new trend can provide the competencies necessary for realizing the Society 5.0 era. We will explore this not only from the higher education and comparative educational points of view but also from the historical view of interdisciplinary learning in higher education. Tracing its roots to the late 1960s shows how the call for interdisciplinarity first gained traction with the push for environmental education, as seen in the events leading up to and following the first Earth Day (1970). Between the inaugural publication of *The Journal of Environmental Education* (1969) and the United Nations Conference on the Human Environment (1972), educators formulated the belief that an understanding of the "total environment," or the interconnectedness of natural, economic, and social phenomena, would require a multidisciplinary approach. This belief has continued to the present in the context of education for sustainable development, being articulated among others in the Bonn Declaration (1999) and the UN Sustainable Development Goals (2015). Yet, apart from a limited number of academic programs, interdisciplinarity within the context of environmentalism failed to materialize as anticipated. Instead, interdisciplinary learning was eventually reformulated in

bolstering the liberal arts and developing twenty-first-century competencies. Nevertheless, the arguments formulated fifty years ago have become increasingly relevant with the growing environmental crisis. The scale and complexity of the current crisis necessitate interdisciplinarity capable of developing the ecologically oriented competencies needed to sustain the next generation.

The purpose of the book is to create a foundation for clarifying the role of interdisciplinary education in overcoming the vertical division of academic disciplines and restoring the "integrated nature" of scholarship. This study seeks to contribute to an understanding of how education systems can use the humanities, social sciences, and arts to enhance STEM education and how this STEAM approach to teaching is key to enabling the vision for Society 5.0.

Our book is distinctive along three dimensions. Readers will recognize much of what is going on in higher education in the era of "Society 5.0" and the COVID-19 era from the perspective of their own situations. We emphasize first that higher education continues to confront the COVID-19 pandemic, and educators face and will continue to face the many challenges of teaching in a completely new setting compared to before the pandemic. The more we teach through distance learning, the more we realize how much we depend on technology, including online communication tools such as ZOOM, Microsoft Teams, and others. Because of such changes, we again must renegotiate how technology plays a significant role in our lives. This shift is aligned with the Society 5.0 vision of sweeping adaptations needed for an increasingly technologically integrated society.

Second, these constitute a comparative analysis that will clarify the commonalities and differences between countries. One persuasive hypothesis holds that many countries covered in this project have commonalities in Science and Technology-oriented policy in the emergent knowledge-economy society. However, some persistent differences exist in the various approaches to interdisciplinary education reform. We examine some of the more important commonalities and differences that exist between countries, and we propose some new directions for interdisciplinary approaches to different types of societal circumstances.

Third, the authors of the chapters consist of a combination of individuals who have social science backgrounds supplemented by a few from STEM backgrounds, resulting in an interdisciplinary and novel mix. This project explores various dimensions in which the conventional boundaries

between disciplines will be impacted by changing dynamics in desired educational outcomes.

Finally, as indicated in Chap. 1 this book is based on the outcome of a medium-sized international conference entitled "The Importance of Interdisciplinary Aspects of University Programs: Facing the Challenge of Global Competencies for both STEM and SSHM (Social Science and Humanities)," initially planned to be held at Doshisha University in Kyoto, Japan, in March 2020. However, due to the COVID-19 pandemic, the substance of the conference was held virtually online from November 14 to November 15, 2020. Each presenter submitted a working paper after reading meeting's organizing concept paper. Each of the two online virtual conference presentations included an intensive follow-up discussion in which participants developed further arguments about redefining what it means to study STEM in the current situation, defining the emerging roles of the university for students, and how Asia-Pacific higher education is changing within the dynamics of the Fourth Industrial Revolution and the Society 5.0 era. Individual chapters are interrelated with an overarching theme while providing comparative points of view between the Asia Pacific, such as Japan, Taiwan, South Korea, and the United States. These arguments are analyzed comparatively in examples from the United States, Slovenia, Japan, Korea, and Taiwan.

Kyoto, Japan — Reiko Yamada
Tokyo, Japan — Aki Yamada
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Contents

Notes on Contributors

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Takuya Kimura is a professor at the Faculty of Human-Environment Studies, Fukuoka's Kyushu University, Japan, and a professor (Cross Appointment) at the National Center for University Entrance Examinations, Japan. He holds an MA from the University of Tokyo in Philosophy of Education, and a PhD from Tohoku University in Sociology of Education. He is the President of Japan Association of College and

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Deane E. Neubauer holds a BA from the University of California Riverside and MA and PhD degrees from Yale University. He is also Emeritus Professor of Political Science at the University of Hawaii at Manoa, where he also served as founding Dean of the Social Sciences and Interim Chancellor of the Manoa Campus and Interim Vice President for Academic Affairs of the multi-campus University of Hawaii System. He also for over ten years served as Senior Adjunct Faculty of the Professional Development Program of the East-West Center, and Co-director of the Asia Pacific Higher Education Research Partnership (APHERP) of which he was a founder. APHERP is located at Lingnan University Hong Kong. His research specialty is comparative higher education policy.

Masaaki Ogasawara is a professor emeritus at Hokkaido University and the former president of Japan Association for College and University Education. He holds an MA degree from Hokkaido University, School of Science, and later the title of Dr. of Engineering while he was working for Faculty of Engineering, Hokkaido University. His interest gradually shifted to science and technology education when he was working as the head of the Department of Integrated Science, Hokkaido University of Education. Then, he became a professor at Hokkaido University where he was assigned to the director of Research Division of Center for Research and Development in Higher Education, concurrently with holding the post of professor in the Department of Applied Chemistry, Graduate School of Engineering. Also, he worked at Tokyo University of Agriculture and Technology and the University of Tsukuba.

Gregory S. Poole is a Professor of Social Anthropology at Doshisha University, Kyoto, Japan, where he previously served as the Vice President for International Affairs and Dean of The Institute for the Liberal Arts. Greg holds a PhD in Social Anthropology from the University of Oxford. His area of research focuses mostly on the anthropology of education and his books include three co-edited volumes, *Foreign Language Education in Japan: Exploring Qualitative Approaches* (2015), *Reframing Diversity in the Anthropology of Japan* (2015), and *Higher Education in East Asia:*

Neoliberalism and the Professoriate (2009), as well as a monograph, *The Japanese Professor: An Ethnography of a University Faculty* (2010).

Hasuk Song is a professor at Dasan University College of Ajou University, Korea. He is the Dean of Dasan University College and the Director of the Center for Convergence Education. Also, he is the President of the Korean Council for University General Education. He holds a PhD from Claremont University, US. His major is philosophy, especially analytic philosophy, and logic. While teaching at Ajou University, he has been striving for improvement and innovation in liberal arts education. Recently, he is interested in research for convergence education based on liberal arts education.

William R. Stevenson III is an associate professor in the Department of Education and Culture at Doshisha University. He holds a PhD from the University of Hawai'i at Mānoa and is studying the history and practice of environmental education. He lives with his wife and three boys in Kyoto City where he spends much of his time running a garden-based learning project for students of all ages.

Reiko Yamada is a professor at the Faculty of Social Studies and Director of the Center for Higher Education and Student Research at Kyoto's Doshisha University, Japan, where she was also the former Dean of the Faculty of Social Studies. She holds MA and PhD degrees from the University of California, Los Angeles, School of Education, in Social Sciences and Comparative Education. She has long been interested in comparative higher education policy in Organisation for Economic Co-operation and Development (OECD) countries. More recently, she has conducted a quantitative study for acquisition of global competences before and after the COVID-19 pandemic and is engaged in comparative student research between Japan, Korea, Taiwan, and the United States. She served as the Director of the Center for Learning Support and Faculty of Development. She also served on the committee of the Central Education Council in Japan. She is the president of the Japan Association for College and University Education. She is the author of *Prospects for University Education in 2040: Based on 21st Century Learning Outcome* (2019). She is also the editor of *New Directions of STEM Research and Learning in the World Ranking Movement: A Comparative Perspective* (Palgrave Macmillan, 2018). She has published 9 single-author books and

11 edited books in both Japanese and English. She has published more than 150 articles in both Japanese and English.

Aki Yamada attended Doshisha University in Kyoto, Japan, with a Bachelor of Arts in Policy Studies. She continued studying at Doshisha University and received her Master of Arts in American Studies. During her master's program, she studied at Stanford University for one year as a Freeman Spogli Institute Visiting Researcher. Aki began her doctoral studies in education at the University of California Los Angeles in 2011, pursuing research on New Japanese living in the United States, under the direction of advisor John Hawkins. After graduating, she worked for four years as an assistant professor in the Empowerment Informatics leading graduate program at the University of Tsukuba. Aki is an assistant professor at Tamagawa University. Her research interests include globalization, contemporary Asian immigration, transnational identity, STEM and STEAM education, and internationalization of higher education. Her research methodology focuses on qualitative studies, with an emphasis on ethnography. She has published several comparative studies on higher education trends in Japan and the United States. In 2018, Aki co-edited a book that Palgrave Macmillan published as part of its International and Development Education series (a series for which John Hawkins, Reiko Yamada, and W. James Jacob served as co-editors): *New Directions of STEM Research and Learning in the World Ranking Movement: A Comparative Perspective*. In 2021, She has also published article "Japanese Higher Education: the Need for STEAM in Society 5.0, an Era of Societal and Technological Fusion" in the *Journal of Comparative and International Higher Education*, 2021, and three book chapters (1) "Globalisation in Higher Education: Bridging Global and Local Education" (Springer 2022, *International Handbook of Globalization, Education and Policy Research*), (2) "Globalization and Higher Education Reform in Japan: Pre and Post Covid-19" (Springer 2022, *Discourses of Globalization and Higher Education Reforms: Emerging Paradigms*), and (3) "STEM Field Demand and Educational Reform in Asia-Pacific Countries" (*The Oxford Handbook of Higher Education in the Asia-Pacific Region*).

Jason Cheng-Cheng Yang is a professor in the Department of Education at the Teachers College of National Chiayi University (NCYU) in Taiwan. He is the Associate Dean of Academic Affairs Office at NCYU since 2022, the Secretary-General of Chinese Taipei Comparative Education Society since 2019, and the Deputy Secretary-General of Taiwan Higher Education

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