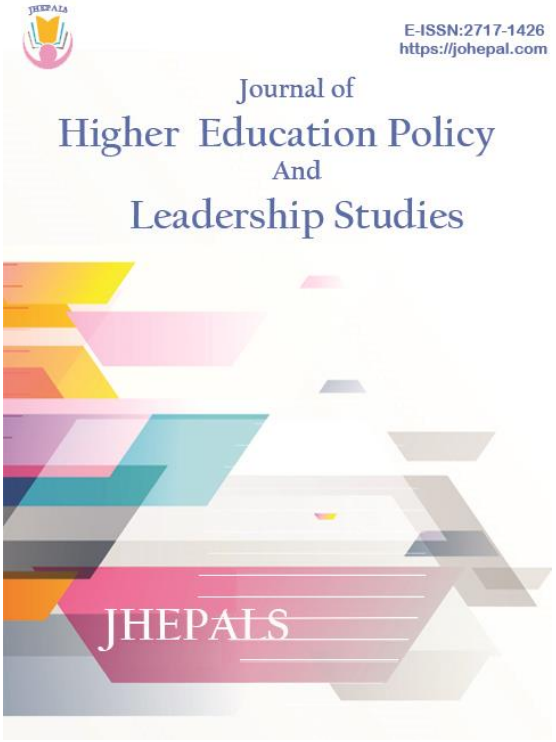
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Book Review: **Universities in the Knowledge Society: The Nexus of National Systems of Innovation and Higher Education**

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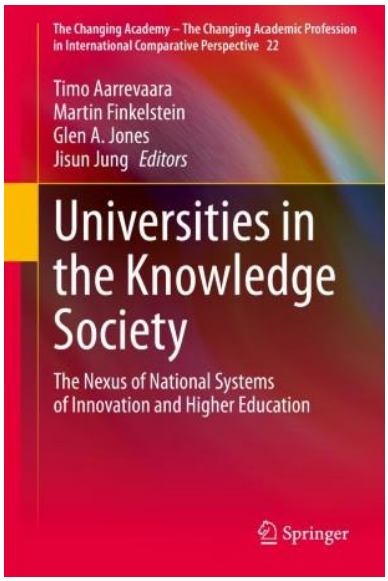
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Book Review

Universities in the Knowledge Society: The Nexus of National Systems of Innovation and Higher Education

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The first in a new series on The Changing Academic Profession in International Comparative Perspective, this volume considers the transformation of the academic profession in a changing global economy which places a focus on knowledge as means of economic and social development. Where research was once the domain only of 'industry', taking place outside of higher education or in dedicated research institutes, increasingly we are seeing greater pressure being placed on universities for undertaking advanced research. More importantly, that research is increasingly expected to be "visibly relevant" to wider society

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(Tiechler, et al., 2013), as "external activities, societal interaction, and engagement are challenging the traditional modes of work in the academy" (Aarrevaara et al., 2021, p. 4).

In this volume, the authors of each chapter draw on preliminary results gathered as part of a large, international survey, implemented in 2019-20. The Academic Profession in the Knowledge-Based Society (APIKS) project surveyed higher education systems across the globe, administered and subsequently analysed by twenty-two research teams spanning five continents. The APIKS project provides a comparative view of higher edition systems around the world through the insights and experiences of the academic professionals working within them. The survey addressed prescient issues such as the changing role of the professoriate including working conditions, career trajectories, and the increasing pressures placed upon academics to make a positive contribution to society and in the development of their nation in the global economy, through research, teaching, public service. This volume will not only be of interest to those wishing to examine the changing nature of work in academia from an international standpoint, but the case-studies of each individual nation offer key insights into the effects of local and national interest as well as the nuances of cultural and societal needs in each geographic location.

The volume is separated into three parts: Part one begins by providing an overview of the concepts of the knowledge society and knowledge economy. They explore how institutions have transformed in response to shifting contexts within higher education and at a national level, in the advent of the global knowledge-based society. Chapters two and three consider the evolution of modern universities and the new role for academia in the era of the global knowledge-based economy. The final chapter in part one introduces readers to the APIKS project, the data from which the subsequent chapters were derived, as they each discuss their national case studies. Part one concludes with the editors addressing their argument for a comparative perspective on the academic profession and higher education systems in light of the centrality of its role in a knowledge-based society.

In part two, eighteen chapters covering individual case studies take the reader through the various national systems which constituted the APIKs study, from the perspective of research and innovation, and the role of higher education. The first of these chapters by Ndibuuza, Langa, and Bisaso focuses on Uganda's national development agenda. The authors explain how, despite government rhetoric, the pressure on the Ugandan higher education sector is not being implemented at the institutional level. This mismatch between policy and practice, coupled with low funding for higher education and research as well as insufficient infrastructure — including academic staff — means Uganda's ability to participate actively in the global knowledge society is a challenge, at best.

Staying within Asia for chapter six, Shen and Luo discuss China's Talent policies as a means of driving their participation in the global economy, with higher education functioning as "human capital banks" (Shen & Luo, 2021, p.83) as a source of knowledge for innovation-led growth. The authors suggest efforts now focus on creating a sustainable and open academic environment, with new models for evaluations that focus more on long-term outcomes than short-term rewards, to minimize brain drain. They make an astute suggestion that more monetary investment alone is insufficient; the key to increasing innovation may be in the academic environment itself. This is a common conclusion in many of the following case studies. In describing the interaction between higher education and

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the national research infrastructure in Taiwan, Ho and Chen describe the past two decades in Taiwan's higher education system, and how it has shifted from a focus on industry to embracing higher education as the new seat of their research and development. However, the fast and furious growth of higher education has had a profound impact on the labour market, with brain drain the result of their success, similar to Shen and Luo's observations of China. With the over-saturation of academics in Taiwan but a decline in academic positions, an exodus of qualified academics moving into industry, and ageing academic faculty, Ho and Chen suggest that knowledge generation and innovation is precarious, which may have profound effects on future spending of research and development funds.

In chapter eight, Arimoto, Daizen, and Huang provide an overview of Japan's academic situation over the past three decades, providing a useful comparison with other OECD countries, relating to research and development. The authors argue that the government must provide greater investment in research and development, as well as in public higher education, to increase research productivity and must counter the effects of the shift from block funding to competitive funding of institutions, to prevent further decline in teaching-oriented institutions as part of the R-T-S (research-teaching-study) nexus to encourage collaboration between industry, business, and academia. In the final case study in this region, Lee and Jung dissect South Korea's successful top-down national research system in chapter nine, and the subsequent expansion of the higher education system under government-driven policies, which has led to economic growth to the extent that the proportion of applied research being generated by universities is amongst the highest between nations. They attribute this success to the efficient use of their limited natural resources—making the most of their human capital instead— in addition to close collaboration between sectors, and the foresight to utilize their increasing research capability to switch to a technology-based industry.

Moving out of Asia, in chapter ten, Uslu et al. begin part two of the volume with a discussion of the state of Turkey's contribution to the global knowledge economy. Interventions by the government to strengthen and expand higher education have been implemented with the aim of developing its science and technology capacity to become a contender in the world's top economies by 2023. As an emerging nation in the global economy, Turkey has introduced a research-university framework along with specific science and technology policies directly linked to higher education. Uslu et al. express a valid concern regarding the current gap between policy expectation and actual achievements in science and technology, suggesting that—despite the recent creation of a higher education quality council (HEQC)— a significant focus continue to be placed on quality, so it is not at the detriment of quantity and expansion. For chapter eleven, Panova and Yudkevich take us to Russia, their discussion centring around path dependency in Russian higher education, with the traditional separation of research and teaching: a higher education sector of universities, and a non-teaching research sector based in research institutions. In recent years, the higher education sector has grown and is now accompanied by a research-intensive private higher education system, with the few public institutions that remain being heavily teaching-focused and of lesser quality. Though the role of the higher education sector in research and development is increasing, there is no current participation in any national innovation agenda. The authors point out that academic careers being of low status

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in Russia due to decline in government interest in the post-soviet era is only contributing to other issues in the system, including an ageing academic population and brain drain.

Moving onto Lithuania in chapter twelve, one of the fastest-growing economies in the EU, Leišytė et al. discuss the innovation capacity of the nation and how the higher education system contributes to their research and development, as a "learning" society. After having undergone a substantial political, economic, and social transformation, Lithuanian higher education has seen expansion in both size and vertical stratification, and in response to the Bologna reforms in the mid-2000s now has its first long-term strategy for research and development through the establishment of the 'science valleys' as centres of innovation. The authors point out, however, that Lithuania's technology transfer infrastructure is left wanting due to lack of specialization and incompatibility with the higher education sector, leading to an increase in research and development investment for business and enterprise over higher education.

Mägi, Kindsiko, and Beerkens, in chapter thirteen, address higher education for the knowledge society in Estonia, which like Lithuania has seen a significant transformation in the last few decades. The authors question whether the traditional take on research and development is still apt in contemporary society; they suggest a potential move away from competitive funding of research and development labs to more integration with higher education for greater stability and fostering new talent may be the way forward, with a focus on new career pathways and financial remuneration as key to attracting new academics to an ageing profession.

In chapter fourteen, Götze takes us to Germany to discuss the evidence surrounding the government's push for the commercialization of knowledge, with reforms in higher education *for* the Knowledge economy, via higher education expansion. Despite an attempt at commercialization of research through cooperation between universities and industry, Götze suggests there is little practical application of this at the institutional level. Chapter fifteen sees Carvalho, Diogo, and Santiago discuss Portugal's response to European demand of increasing knowledge to reduce differentiation between nations and the subsequent inadvertent development of a new professional group of "researchers" widening the gap between research and teaching, and creating a dualist function for academia in both higher education and for scientific research, and development.

Joining the European Union saw Finnish HE policy shift from various regional agendas towards a more international focus, with a more formal, independent status for public higher education. More recently it has seen an increase in student numbers, university mergers, and institute reforms. In chapter sixteen, Aarevaara, and Pietiläinen address the key involvement of higher education in research and innovation within the dual-path system in Finland and note untapped opportunities between the two sides of their HE system, rather than structurally within each.

In chapter seventeen, Lundborg and Geschwind point out that the presumed ability of universities to function as education institutions, research centres, and innovation engines simultaneously in what appears from the outside to be a unified system, is not borne out in practicality; despite recent efforts by the Swedish government to strengthen this through policy, the most effective way to go about this remains in contention, with varying perspectives on what it is precisely that needs to be improved.

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In chapter eighteen, Marquina and Luchilo address research and innovation in the knowledge society as it relates to Argentina, now shifting the story from Europe to South and central America. The authors point to academia itself as a key area of interest when thinking about ways to better link education with innovation, which they have clearly laid out in this chapter, noting around 80% of the country's academics engaging in research part-time, as an aside to their main role outside of the university, and remaining 'local' in their inclinations.

Véliz and Celis explore the development of Chile as a knowledge economy in chapter nineteen, shifting from the exploitation of natural resources to the exploitation of knowledge through research and innovation, with the government having recently initiated programs aimed at increased technology transfer between universities and industry. Chile has seen massive expansion of its higher education system with increases in not just student numbers but also in terms of institutional diversity and internationalization; yet despite the apparent success, the authors note that Chile lags far behind many developed nations in terms of doctoral-degree holders with a focus on research at Chilean universities. They call for more empirical data on key issues to better understand the challenges involved in creating better working conditions and greater equity in Chilean academia.

Estévez-Nenninger et al. take us through the current state of Mexico's science, technology, and innovation systems and explore efforts to increase the role of higher education in this context and the advancement of the academic profession itself. A point of note is the alignment of research and innovation with the role assigned to the institution which is not always in congruence with the development of science and technology.

In chapter twenty-one, Moving to North America, Bégin-Caouette et al. present the structure of the Canadian higher education system and its relation to research and development, given that they are governed by provincial and federal government, respectively. Despite an increase in student numbers, tenure-track research faculty have not quite experienced the same level of growth; with an increase in precarious employment, this only leaves further questions over the future productivity of research and innovation. The authors provide an astute observation that the scope of investment in research, as well as the social applications of said research and corresponding economic returns, will largely be decided by the diversity within higher education faculty and student bodies in addition to the accessibility of academic research as a profession.

For the final chapter of the national case studies, Finkelstein et al. address the changing role of the higher education system in research and innovation within the United States, and its 'redefinition' of faculty's role in public service. With the increasing number if precarious, part-time or short-term faculty positions due to financial constraints over the last decade and, consequently, fewer long-term academic career prospects, as well as the bulk of research and development being situation within a small sub-set of "leading research institutions", the involvement of the majority of the higher education system in the knowledge economy is indirect, as providers of human capital.

Part three comprises the final chapter of this volume and concludes with an overview of the key findings from the various national systems from a comparative perspective. The volume is thorough, and the conclusion provides comprehensive summary, as the editors discuss similarities and differences between the national case studies, highlighting changing

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research and development policies, and greater levels of coordination between higher education, the business sector, and the government. At a time of shifting roles and relationships and increasing centrality of higher education as a bringer of change in the knowledge society, there are profound implications for doctoral education and the wider academic profession. The editors leave us with key questions around how we may go about creating more sustainable research and innovation systems on a global scale. This volume may arguably become a key text for those interested in exploring the knowledge society from an international perspective.

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Ms. Alison Elizabeth Jefferson is a Doctoral Candidate in Higher Education at the Ontario Institute for Studies in Education, at the University of Toronto. Her dissertation research explores the experiences of doctoral students during the global pandemic as it may affect their socialization to the academic profession, analysed through a Bourdieusian lens. Alison currently works as a research assistant for the Canadian team of the Academic Profession in the Knowledge-based Society (APIKS) project. She has published scholarly papers on academic inbreeding, doctoral socialization, and the academic profession.

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