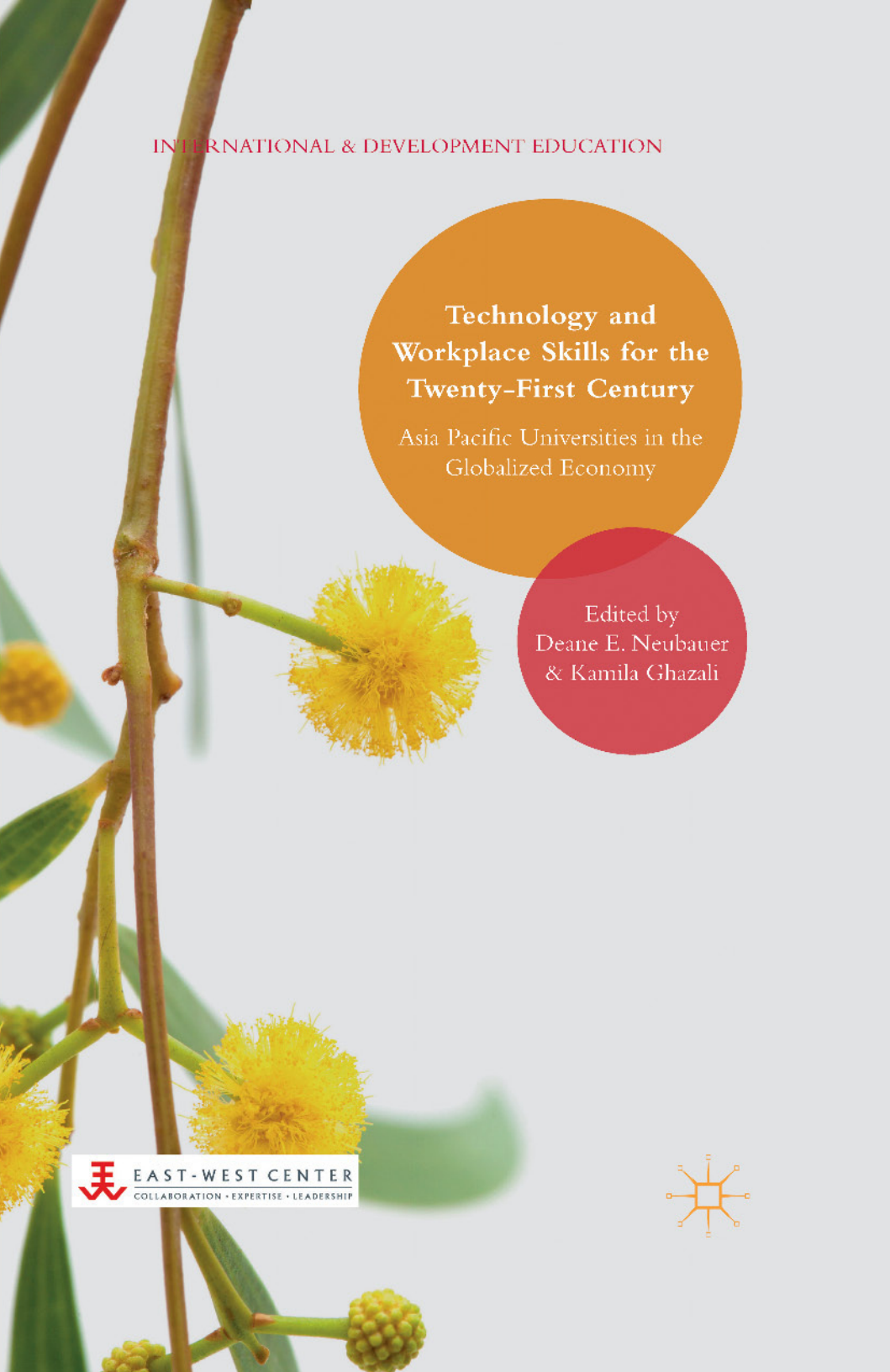

INTERNATIONAL & DEVELOPMENT EDUCATION

Technology and Workplace Skills for the Twenty-First Century

Asia Pacific Universities in the Globalized Economy

Edited by
Deane E. Neubauer
& Kamila Ghazali

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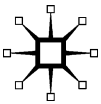

TECHNOLOGY AND WORKPLACE SKILLS FOR THE TWENTY-FIRST CENTURY

Softcover reprint of the hardcover 1st edition 2015 978-1-137-49191-6

First published in 2015 by
PALGRAVE MACMILLAN®
in the United States—a division of St. Martin's Press LLC,
175 Fifth Avenue, New York, NY 10010.

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Palgrave Macmillan is the global academic imprint of the above companies and has companies and representatives throughout the world.

ISBN 978-1-349-57371-4 ISBN 978-1-137-49192-3 (eBook)
DOI 10.1057/9781137491923

Library of Congress Cataloging-in-Publication Data

Technology and workplace skills for the twenty-first century : Asia Pacific universities in the globalized economy / edited by Deane Neubauer and Kamila Ghazali.
pages cm.—(International and development education)
Includes index.

1. Education, Higher—Economic aspects—Pacific Area. 2. College graduates—Employment—Pacific Area. 3. Education, Higher—Effect of technological innovations on—Pacific Area. 4. Education and globalization—Pacific Area. I. Neubauer, Deane E. II. Kamila Ghazali.

LC67.68.P33T43 2015
338.4'3378—dc23 2015003169

A catalogue record of the book is available from the British Library.

Design by Newgen Knowledge Works (P) Ltd., Chennai, India.

First edition: July 2015

10 9 8 7 6 5 4 3 2 1

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Introduction

Kamila Ghazali and Deane E. Neubauer

The twenty-first century has borne witness to a steadily increasing pattern of global interdependence, a keystone of which has been the progressive and seemingly inescapable conjoining of economic activity throughout the world. This trajectory has been amplified by the role being played by technology of all forms, but most especially (perhaps!) those that link information, computing, communication, and automation. Whereas David Harvey's judgment of 25 years ago that contemporary globalization had resulted in the annihilation of time and space seemed perhaps to border on overstatement, today it is a proposition that few would contest (1990). Situated at the center of this transformation is the nature of work in economies of all stripes, as these forces of change rapidly impact what kinds of work are done, where, and by whom. Closely linked to these phenomena is the myriad of ties that link education at all levels with what we can more appropriately term the "worlds of work." It is also true, that there remains a digital divide, that shuts out over sixty percent of the world, which does not participate in those aspects of globalization that require this form of technology. This fact has significant implications for the link between learning and work.

In November 2013, the Asia Pacific Higher Education Research Partnership (APHERP), a membership organization of some 23 education-related entities, invited participants from across the Asia Pacific region to discuss this issue and to explore the various problematics embedded within it. In preparation for the event, the codirectors of APHERP developed a so-called "concept paper" that outlined a range of initiatives that have already appeared as various entities throughout the region to begin to "think through" different aspects of how these changes in "thinking about and 'doing' the world" are impacting higher education and its increasingly important role of educating graduates for a rapidly changing world—and especially, a rapidly changing world of work. A revised version of this appears as chapter 1 of this book.

The book seeks to identify some of the many forces that are producing these changes in the presumed competencies that higher education graduates should possess. These give particular attention to the challenges that have arisen through the complex dynamics of globalization, as they impinge upon and shape the forces of production and consumption throughout the world. The authors of the chapters in this book give particular attention to the changing nature of communication dynamics within contemporary economies, implications that these produce for the nature of undergraduate and postgraduate education, and the kinds of opportunities that are presented to enlarge and tailor curricula to meet such demands. In addition, one contribution, chapter 12 by A. Lee Fritschler and Arthur M. Hauptman, proposes a rather novel method of decision making for Higher Education Institutions (HEIs), based primarily in the United States, faced with the kinds of decisions involving quality and relevance—that such significant structural changes are making compelling—within the higher education setting.

Discussions in various other chapters entail numerous propositions that link the phenomenon of the emerging knowledge society to contemporary higher education. At the center of these concerns stands the issue of what higher education does and can do to prepare students for the challenges that await them as they leave higher education and seek employment and viability within a continuously changing knowledge society. The book outlines the problematic that is presented in part one and follows with substantive country chapters that constitute the second part of the book.

Throughout the world, we have, over the past decade and a half, witnessed profound changes—both in how HEIs conceptualize their current missions and the changes that have taken place in response to these mission obligations, especially in regard to provisioning students with workplace skills. It goes almost without saying that the most prevalent and obvious is the encroachment by social media and social intelligence in all spheres, which does not preclude higher education. Increasingly, and transparently (as documented by several chapters in the second part of the book, perhaps most especially those by Thipakorn and Tawornpichayachai—chapter 5—and the group from Fu Jen Catholic University—chapter 14), higher education is being exposed to the need to juxtapose employers' expectations with those of their own institutions. Beyond that is the challenge to be increasingly mindful of faculty capabilities to train, what Gibson (chapter 3) calls the NeXter generation, and the impact that a constantly evolving variety of technologies are having on the technologies of students and educators. As a variety of discussions seek to work out, a match between employer needs and graduate competencies, consideration of the kind of future world that we would want students to shape is equally pertinent—the kind of world that will make the future better

than the present or the past. How, we are increasingly forced to ask, do we equip them with the necessary skills to perform jobs that do not exist yet?[1] Perhaps it is time, as Deborah Halbert (chapter 4) suggests, that universities create a new set of academic majors that would directly embrace key elements of this problematic.

The book is organized around four conceptual chapters that constitute its first section. Hawkins and Neubauer open the discussion by revisiting the dynamic social tension created by the persistent "alignment" dilemma that exists and persists between society in general, and economic institutions, in particular, with higher education as a defined social sector that directly experiences these dynamics. They seek to establish the nature of this structural tension and begin to explore how HEIs are responding to the political, economic, and social tensions that it engenders. This introductory statement of the alignment dilemma then indicates a recognition of the increasing validity of the notion that profound changes *are* taking place throughout the world, in what is viewed as the overall *ecology of higher education* that has resulted in new expressions of need for higher education competencies that can be linked to new and emergent workplace skills. The chapter examines a limited set of these responses introduced in the United States, Europe, and Asia, and suggests that HEIs will further move in the direction of developing either these or like approaches to undergraduate education, often in the form of increasingly specific graduation requirements, with the impetus for this arising severally from multiple sectors of society as they articulate foci that have come to play a significant role in the education/employment dynamic, which itself is subject to continual change.[2] The chapter concludes by reviewing the efforts of various major quality assurance agencies to develop evaluation criteria that reflect this direction.

Chapters 2–4, as alluded to above, seek to provide far-reaching conceptual analyses of some of the dynamics at play within this overall problematic of twenty-first century learning skills, from the pervasive interplay between social media and social intelligence (Jacobs, chapter 2) to issues related to the continuous challenges within higher education to stay abreast of emergent technologies (Gibson and Sodeman, chapter 3). From a slightly different focus, Deborah Halbert (chapter 4) goes to the very heart of what, for many HEIs, is the continuously emergent dilemma of dealing with constantly changing external environments. Namely, under such conditions, what *should* the curriculum be, and how can efforts to keep it (them) simultaneously timely and relevant honor and respect the traditions, knowledge, and effective pedagogies of the "existing curriculum," wherever and whatever they might be? It is at this juncture that many of the contests over relevance are occurring within and outside higher education, especially with new higher education providers entering the market.

The second section of the book consists of country-specific chapters that seek to explore the diverse pathways that various Asia-Pacific countries are pursuing to respond to these challenges. One can gather from these explications very different approaches to the challenges posed by the extensive and rapid vectors of change. Across the board, one can observe two dynamics. In the first instance, there is a sense of agreement on the potential reach that these dynamics may have across higher education and an appreciation that significant changes will need to occur over time. On the other hand, such changes are taking place very much within the historical structures of national higher education statuses, regulation, and financing, and within what have become some of the over-arching contexts of higher education change, namely, the quest for status within international rankings, and the continuous reformulation of higher education to align with the various assumptions and premises of an over-arching neoliberal-influenced public policy.

In this collection, seven such chapters focus on Asia specifically (chapter 5 Thailand, chapter 6 Japan, chapter 9 China, chapters 10 and 13 Malaysia, chapter 1 Vietnam, and chapter 14 Taiwan). The variation of focus and approach on these changing dynamics of higher education is, as the reader will discover, considerable—ranging (just for example) from the efforts of King Monghut's University for Technology in Thonbury in Bangkok to develop what it views as a third-generation engineering education program to train and graduate "*imagineers*," as highly trained and self-conscious agents of social change; to Yamada's report on the movement to bring HEIs (including her own) closer to both students and society through the development of "learning commons"; to the development of "graduate employability programs" and emerging post-graduate employment contexts in Malaysia (in the chapters by Ghazali, and Shukaran and Lie) and extensive undergraduate work/internship programs in Taiwan. Finally, Ngoc examines the self-conscious efforts in Vietnam to push back the overarching framework of government regulation and curricular stipulation as to allow closer cooperation between HEIs and the—largely private—employing sector.

Among the other chapters in this second section is one from Australia (Cuthbert and Molla) that seeks to track and examine, in considerable detail, the kinds of dynamics in the smaller, but yet highly complex, political economy of Australia, where, within the past few years, significant amounts of structural change, primed by a continuing society-wide pivot in the direction of neoliberalism, have occurred within the higher education sector (with a variety of consequences, see Ziguras and McBurnie 2007). In many respects Australia is an ideal site to explore changes in the nature of graduate education as its relatively small population size provides a rather transparent frame from which to examine how such changes ripple through a small but distinguished set of HEIs. In this regard, we have come to see Australia as a

likely forerunner of other higher education changes likely to occur in Asia and throughout the world.[3] The other two chapters in this second section of the volume focus on the United States and focus, in different ways, on the *policy dimensions* of the transformations associated with the kinds of changing structures and practices associated with the movement toward twenty-first century work and learning skills. Johnsrud (chapter 8) focuses on what has come to be called the "iron triangle" of US higher education: *delivering high quality education with fewer resources to far more students.* Johnsrud argues that no matter what demands for transformation are made to HEIs, they must, at some level, operate within the constraints represented by the "iron triangle." Her chapter, informed by her own extensive administrative experiences in higher education, seeks to assist a wide variety of actors—faculty, administrators, legislators—and help to clarify the nature of their varied policy tasks.

Fritschler and Hauptman operate within a similar policy environment, but choose a very different approach (chapter 12). Both contributors combine extensive personal life experiences in higher education *and* government. From this perspective, they have observed that, all too often, efforts to resolve difficult higher education policy issues fail either because the approaches being attempted confuse the interests that varying participants have in the process, or the process itself fails to recognize the legitimacy of how different interests might, could, and should play out in different decision-making settings. In their model, Fritschler and Hauptman provide a detailed method for dealing with many of the complex change issues to facilitate informed but decisive institutional decision making.

In the final chapter, Neubauer and Ghazali provide a set of propositions and observations that seek to frame both the emerging conditions of transformation within which the Asia Pacific region is increasingly situated, and various "pathways" that have been suggested by the chapters of this volume as useful and perhaps necessary responses on the part of higher education to these challenges. As an increasingly global enterprise itself, higher education in the Asia Pacific is being challenged by an array of forces, some from inside the societies within which it has grown, and some—increasingly novel—from institutions outside those societies, many of them of rather recent origin.

Notes

1. This question, originally asked by the popular Youtube video "Shift Happens," has stirred a minor growth industry in variations of the original video some ten years ago. Available online at: https://www.youtube.com/watch?v=emx92kBKads.

2. Almost any casual examination of the financial or higher education pages of major newspapers or websites will reveal a more "recent" instance. For example, as this chapter is heading for publication submission, the British Council and Think Global got together for a program: "The Global Skills Gap: Preparing young people for the global economy." The point here is that the almost ubiquitous nature of such pieces represents both the extended nature of the "issue" and the further point that, because of its problematic character (the fact that higher education systems and economies are in a process of continuous co-variance), the phenomenon represented is itself of a continuous and changing nature. Available online at: http://clients.squareeye.net/uploads/dea/documents/BusinessPoll_online_TG.pdf. Accessed: December 14, 2014.
3. Indeed, this presentation was sufficiently provocative that the sponsoring organization of the meeting from which these papers originate, The Asia Pacific Higher Education Research Partnership, chose to conduct a subsequent seminar at the Royal Melbourne Institute of Technology University (RMITU) in March 2014. Papers presented there are in preparation and will be published as a Palgrave Macmillan volume in 2015, *Changing Aspects of Graduate Education in the Asia Pacific Region*, Deane E. Neubauer and Prompilai Buasuwan, Editors.

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Part I

The Problematic

Chapter 1

Twenty-First Century Work Skills and Competencies

John N. Hawkins and Deane E. Neubauer

The Setting

The twenty-first century has borne witness to a steadily increasing pattern of global interdependence, a keystone of which has been the progressive and seemingly inescapable conjoining of economic activity throughout the world. This trajectory has been amplified by the role being paid by technology of all forms, but most especially (perhaps!) those that link information, computing, communication, and automation. Whereas, 20-some years ago, David Harvey's judgment that contemporary globalization had resulted in the annihilation of time and space seemed perhaps to border on overstatement, today it is a proposition that few would contest (1990). Situated in the center of this transformation is the nature of work in economies of all stripes, as these forces of change rapidly influence the kinds of work being done, where, and by whom. Closely linked to these phenomena is the myriad of ties that link education at all levels with what we can more appropriately term the "worlds of work." It is also true, that there remains a digital divide that shuts out over 60 percent of the world that does not participate in those aspects of globalization that require this form of technology. This fact has significant implications for the link between learning and work (see Internet World Stats, available online at http://www.internetworldstats.com/stats.htm).

And for all that we accept, almost in a commonsensical manner, the root proposition that education and economic accomplishment are inseparably linked, it is nevertheless often the case that the internal dynamics and structures of education and economy operate such that, as societal sectors, they are out of alignment. This oft-marked *misalignment* crisis has had two distinct features that have occurred in various and different societies throughout the world. On the one hand, even as economic growth has propelled society after society into the so-called massification stage of higher education, its institutions have tended to produce graduates ill suited for the demands of the economies into which they are entered: in the worst of cases they are merely unemployable. On the other hand, as higher education institutions (HEIs) in many societies struggle to adapt to patterns of changing economic development and job demands, the very nature of the societies in which they are situated is being significantly impacted by economic transformative forces. It is from this continuously interactive structure that we conclude that, within this alignment dilemma, higher education inevitably tends to play a "catch up" role—it is always, in some important senses, "behind the curve" in seeking to behave responsibly in preparing its graduates for the world they are about to confront when leaving higher education. This is true both among the "connected" and the "disconnected" worlds. The critique of higher education has ranged from the classical Dore "Diploma Disease" whereby HEIs, especially in emerging economies, are simply providing credentials regardless of alignment to the work place, to the debate on the vocationalization of HE versus the quest for general education and liberal arts (Dore 1997).

Several structural and behavioral consequences flow from this situation/circumstance. One is the pattern of educational re-entry, as workers within these transitional economies find it necessary to return to higher education to retrain themselves, in an effort to accommodate a constantly changing job market. This is not a new idea, as many HEIs have successfully offered a variety of Extension classes for adult retraining.[1] What is new is that the speed, efficiency, and cost factors are being transformed through the use of mixed technology. A major target market for these new digital programs are the so-called "baby-boomers" who find that the changing economy is extending their work-life and that, in many cases, they are not prepared for the skills being required. There is a variety of modes of this sort of learning platform and many are composed of collaborative partnerships between the traditional university extension and the private sector. For example, at UCLA Extension, the new "Empowered UCLA" program is a partnership with

Encore Career Institute of Silicon Valley to offer a series of new certificates delivered on-line to a new audience. Certificates are offered via the Apple iPad and consist of an initial "career assessment" exercise, a comparative assessment of student skills, interests, and experience that are then matched up with one of the new certificate courses, which, in turn, are closely aligned with the current job market in the region. The program boasts of learning flexibility, portable technology, a high level of instructor interaction, built-in social media, and networking features. Career counselors offer support via email, phone, and webinars, thus combining a variety of digital approaches to a specific job related training program. This type of program is not free, but costs can be kept low due to the scale of adult students who can sign up (see UCLA Extension, available online at https://www.uclaextension.edu/pages/extn/Empowered.aspx).

Another outcome has been the vast increase in graduate programs, as workers in their middle to later years return to higher education and see graduate education as involving skill sets and perspectives that they may need to succeed. American data currently suggests that adults will remain in their current jobs for about four years. Thus, it is becoming increasingly the case that adults in such high job transition environments require the "educational packages" to compete in the marketplace. A step further in this social process are recent data indicating that only about 43 percent of adult Americans are currently holding *full time* jobs (Jacobs 2013).

In many cases, much of this graduate/workplace-focused education is coming from private sector entities that see this as a lucrative economic sub-sector in and of itself. (The private proprietary provision of US higher education grew from about 3 percent in 2000 to around 10 percent in 2010.[2]) Another factor influencing student choice is an acceptance that HE may have little to do with alignment, and graduates of differentially ranked HEIs receive education consistent with alignment needs at worksite training following graduation; and, throughout the world, we see a shifting sense that massification of higher education is coming closer to universalization of higher education as the demands of employment seemly pay a greater premium on degree acquisition (For a broader treatment of these issues see Neubauer and Tanaka 2011).

To make the case in this way is to emphasize the continual pressure that higher education institutions are under to create opportunities to deal with such issues and to convince their relevant constituencies (e.g., governments, accreditors, parents, students, employers) that their efforts are both relevant and appropriate. In doing so, however, it is possible that HEIs,

given the power and enduring capacity of their own internal structures, may not sufficiently address a critical attendant dilemma that arises in this context—namely, in such a rapidly changing world, what kinds of work skills and/or competencies should higher education students be provided to equip them for the world they encounter upon graduation? Moreover, what kind of teaching/learning platforms are emerging to deliver the skills and competencies that are needed and so rapidly changing?

Addressing Some Suggestive Examples

In an effort to address this issue, we offer four examples of groups and institutions that have sought to "think seriously" about such questions and develop programs and/or parameters of activities that seek to enable institutions to develop programs, technologies, methodologies, and techniques for creating and transmitting such skills and capabilities to twenty-first century learners.

Example One: The Institute for the Future

The Institute for the Future (IFE) is a San Francisco, CA-based group that seeks to conduct various future-oriented exercises addressed to a wide range of issues and problems. In 2011, they turned their attention to the question of what might constitute appropriate twenty-first century workplace skills and learning abilities. In doing so, they first identified six "drivers of change" or "disruptive forces": things that might show up on most observers' survey of things that are indeed in one way or another changing the world in which we live. Seen from various perspectives, these elements may be viewed in the context of increasing global interdependence, increased technology engagement, macro-social transformation, or whatever. The six identified in this exercise are

- Extreme longevity—the fact of increasing global lifespans that are having, in part, the effect of changing the nature of careers and related learning;
- Rise of smart machines and systems—the process by which workplace robotics nudge workers out of rote, repetitive tasks (and which, by the way, leave fewer jobs for human workers);
- A computational world—the massive increase in sensors and processing power that makes the world "a programmable system" and that

seemingly obeys powerful, but as yet poorly understood, laws of computational complexity and capacity;
- New media ecology—the constant invention and social insinuation of new communication tools that require new media literacies beyond those of written texts;
- Super-structured organizations—the continual emergence of social technologies that drive new forms of production and value creation;
- A globally connected world—the fact that increased global interconnectivity puts diversity and adaptability at the center of all kinds of organizational operations.

From these six drivers or disruptors, the IFE argues, arises the need for at least ten future work skills:

1. Sense-Making—the ability to determine the deeper meaning or significance of what is being expressed;
2. Novel and adaptive thinking—developing a proficiency at thinking and coming up with solutions and responses beyond that which is rote or rule-based;
3. Social Intelligence—gaining the ability to connect to others in a deep and direct way, to sense and stimulate reactions and desired interactions;
4. Transdisciplinarity—literacy in and an ability to understand concepts across multiple disciplines;
5. New media literacy—an ability to critically assess and develop content that uses new media forms, and to leverage these media for persuasive communication;
6. Design mindset—an ability to represent and develop tasks and work processes for desired outcomes;
7. Cognitive load management—ability to discriminate and filter information for importance, and to understand how to maximize cognitive functioning using a variety of tools and techniques;
8. Cross cultural competency—ability to operate in different cultural settings;
9. Virtual collaboration—ability to work productively, drive engagement, and demonstrate presence as a member of a virtual team;
10. Computational thinking—ability to translate vast amounts of data into abstract concepts and to understand data-based reasoning (Institute for the Future 2011).

These skills, it is argued, are relevant for situating the learner in the kinds of contingent and probabilistic environments being created by the

overall thrusts of contemporary globalization. As is readily apparent, these skills and capabilities stand astride the ways in which most of our HEIs are organized: by colleges, disciplines, levels of credit acquisition, and even in most cases, competencies. (In a similar effort, see also the Partnership for Twenty First Century Skills, 2013).

Example Two: The Lumina Degree Profile

Seeking to address a somewhat different issue, the Lumina Foundation has focused on the issue of academic degree currency within the American polity, and specifically, the issue of what the various common degrees *mean* in a context within which literally thousands of separate institutions are largely free to establish the content and, by extension, the meaning of their own degrees. Lumina asked a small group of distinguished scholars to think through this issue and propose a set of parameters for degree levels, especially for the baccalaureate and master's degrees (Lumina Foundation 2011).

For the baccalaureate degree, Lumina identified five areas for demonstrated graduation skills: specialized knowledge, broad integrative knowledge, intellectual skills, applied learning, and civic learning. These were operationalized as follows.

In demonstrating specialized knowledge, the student

- Defines and explains the boundaries, divisions, styles, and practices of the discipline;
- Defines and properly uses principal terms;
- Demonstrates fluency in use of tools, technologies, and methods;
- Evaluates, clarifies, and frames a complex question or challenge;
- Constructs a project related to a complex problem; and
- Constructs a summative project, paper, or practice-based performance.

To show broad, integrative knowledge, the student

- Frames a complex, scientific, social, technological, economic, or aesthetic challenge or problem from the perspectives and literature of at least two academic fields;
- Produces—independently or collaboratively—an investigative, creative, or practical work that draws on theories, tools, and methods from at least two academic fields; and

- Explains a problem in science, the arts, society, human services, economics, life, or technology from the perspective of at least two academic fields.

Intellectual skills may be demonstrated by

- Differentiating and evaluating theories and approaches to complex standard and non-standard problems;
- Incorporating multiple information resources in different media or languages in projects, papers, or performances;
- Constructing a cultural, political, or technological alternative vision of either the natural or the human world through a written report, laboratory report, exhibit, performance etc.
- Quantitative fluency, for example by finding a widely read editorial and construct an empirical analysis of it using data;
- Communicating fluency, for example by exploring the expansion of cross-border education in two or more Asian countries employing sensitivity to language difference (or use students on team with multiple language skills).

And finally, in demonstrating a capacity for civic learning the student may

- Explain diverse perspectives on a contested issue and evaluate insights gained from different kinds of evidence reflecting scholarly and community perspectives;
- Develop and justify a position on a public issue and relate this position to alternative views within the community or policy environment;
- Collaborate in developing and implementing an approach to a civic issue, evaluates the process and, where applicable, weigh the result.[3]

The thrust of this suggested framework is a reorientation of the "structure(s) of knowledge," that has (have) been dominant for centuries and the possible basis of discrete indicators to demonstrate learning goals and objectives.

Example Three: Singapore

Following a similar rationale, the Ministry of Education in Singapore has developed a program to inculcate twenty-first century competencies in