

Chapter 3

The Global Research and the “World-Class” Universities

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3.1 Introduction

At the beginning of the twenty-first century, the terms global university, global research university, world-class university, and flagship university are frequently used to indicate the new development of current research universities either in the most developed countries or in emerging nations like China, Russia, and India. In a knowledge-intensive society, many people have realized that the global research university is the key institution for social and economic development. Because of the focus on the discovery of new knowledge, the development of next generation leadership and the global partnership or cooperation in research make it possible for research universities to solve the problems confronting the current world.

Serious research on the concept of the global research university began in 2005, when a group of Fulbright New Century Scholars conducted research on the new developmental trend of research universities. As a key member of that research group, the author suggested to look at the developmental characteristics of the American research university. After a year of discussion, the group identified a series of changes for research universities and then coined the term “emerging global model” (EGM) of research universities. At that time, we were still uncertain about the new model, so the term “emerging” was used to indicate the developmental phenomenon, although the term “global university” was frequently mentioned then. Meanwhile, in *Economist* on September 10, 2005, a survey article about higher education change observed that “a most significant development in higher education is the emergence of a super league of global universities,” which is so “revolutionary

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in the sense that these institutions regard the whole world as their stage, but also evolutionary in that they are still wedded to the ideal of a community of scholars who combine teaching with research” (p. 4).

Five years later, the “global research university” is considered “a force for globalization” (Marginson 2010). The capacity to go global for those research universities reflects in many aspects. In the last two decades, many powerful research universities have been trying to distinguish themselves in various ways. Mohrman et al. (2007) specified the characteristics that defines them by examining different aspects of the research universities, but the most important characteristic lies in their capacity to go beyond the boundaries of the traditional nation-state by advancing the frontiers of knowledge, diversifying the country background of international students, and tapping financial resources globally. Consequently, the global research university is highly internationalized in many respects.

3.2 The Institutionalization of the Global Research University

Global reach in research and in the development of next generation leadership is the core mission of the global research university. This core mission is well articulated on Yale’s university’s webpage where Yale President Richard Levin states: “[O]ur goal is to become a truly global university—educating leaders and advancing the frontiers of knowledge not simply for the United States, but for the entire world.” Levin’s ambition can also be observed in Harvard University President Drew Faust’s speech: “We are an American university, but we have a global reach and a global responsibility” (Smith 2010). In carrying out the global mission and taking the responsibility to go global, many research universities have reorganized their administrative structure. Even the University of Colorado-Boulder, hardly considered as a highly research university in the USA, has organized a task force to review the university’s international strength and weakness and to reform the university administration for the purpose of better participation in the economic globalization process (Moritz 2007).

In addition, within the global research university, the mode of knowledge production has changed from faculty’s independent patterns of inquiry to the current form of “collegialization” (Kleinman and Vallas 2001). According to them, “collegialization” means that like-minded scientists go beyond the traditional concept of research within their own universities and form international alliances or global research teams. In this case, the global research universities act like international buffer agencies in supporting faculty international collaborations. In supporting the global reach of faculties, Harvard university recently establishes another Harvard-backed AIDS research lab in Durban, South Africa. In addition, the recent established Harvard Business School offices in Hong Kong and Shanghai, China, provide more opportunities for faculties in business. While Harvard university president acts like

a diplomat, frequently flying around the world. This is indicative of the changing role of the university president who requires the ability not only to operate but also to negotiate and to lead in complex internal and external academic environments.

About the institutionalization of global research universities, on March 18, 2010, the Boston Globe published an article by J. Smith entitled “Students, Faculty Give Harvard a Global Reach.” In the article, several things are worth noting about Harvard university. Smith first points out that more Harvard students take part in the study abroad program. In 2009 alone, 1,678 undergraduates studied abroad, which is approximately 25% of the undergraduate student body, while there is a steady growth of international students on Harvard campus too. What is even more impressive is the country coverage of the international students; the 4,131 of international students on campus in 2009 came from 140 countries. Clearly, the diversity of international students speaks to the global influence of the university. The second point that needs to be mention here is that the research interests of its faculty are more globalized and diverse than before. Now, there are more than 191 Harvard faculty members who involved their research with China (http://www.boston.com/news/education/higher/articles/2010/03/18/students_faculty_give_harvard_a_global_reach/?page=1). In order to undertake such a global reach, the university has always been able to locate some private funding for support. This is unique to American public or private research universities. As shown in the article in the Boston Globe, in 2008 alone, Harvard pledged \$100 million to broaden its international reach, and more individuals made additional donations to support the university’s global efforts.

Why should a research university go global? There have been many debates and discussions. The question can be answered at both the macro and micro levels. At the macro level, there are two dynamic forces—the knowledge economy and economic globalization. With the knowledge economy, as Lundvall and Johnson (1994) analyze in their work, there is a shift underway from the economics of the production function to the socioeconomic processes of the contemporary innovation system with the advent of “learning economy.” Universities have become part of a new knowledge infrastructure in the national economic development. This was apparent in the United States, after the Second World War, when research universities became part of the national research and development (R&D) system.

Regarding the role of university R&D in the “knowledge infrastructure,” Etzkowitz and Leydesdorff (2000) believe that within the context of today’s knowledge-based innovation and the associated role played by knowledge-based networking, the model of the university center as a vehicle for technology transfer has become organizationally and institutionally more complex, acting as a conduit through which knowledge exchange and exploitation is made more effective.

In defining the knowledge economy, Toffler (1990) states that “the most important economic development of our lifetime has been the rise of a new system for creating wealth, based no longer on muscle but on mind” (p. 9). The World Bank Report (2003) phrased it similarly: “A knowledge-based economy relies

primarily on the use of ideas rather than physical abilities and on the application of technology. . . . Equipping people to deal with these demands requires a new model of education and training” (p. xvii). What Toffler and the World Bank Report suggested for the new model of education and training is well reflected in the global research universities. Internationalization of the university curriculum, sending students abroad for multicultural knowledge, and having faculty develop cooperative research projects across nations are some of the strategies explored by the global research university. Going global is the reaction of those universities to the new form of economy.

In the 1990s, the world experienced a considerable change politically, economically, and socially after the fall of the Berlin Wall and the collapse of the former Soviet Union. While politicians from different parts of the world have an interest in debating the new world order, the large multinational firms or international enterprises focused on the establishment of global markets or global systems of production. Higher education or, more specially, some research universities that had been involved with national R&D and had also been involved in national foreign aid programs now began to work with institutions in other countries and were well-prepared to go global.

In 1994, at the General Agreement on Trade in Services (GATS) discussion, education became an important subject in relation to the international economy, because changing trade patterns influence the productive possibilities of the economy and thereby change the demand for education. Economic globalization, according to Held et al. (1999), is the intensification of worldwide social relations which link distant localities in a way that local happenings are shaped by events occurring many miles away and vice versa. The mass movements of goods, information, and labor by modern technology create new demand for higher education. Over commercial exchange, higher education or more specifically the research university becomes one of the major actors in the process. As Ruby (2005) puts it, “universities are creators and disseminators of knowledge; they shape globalization as much as they are shaped by it” (p. 233).

At the micro level, higher education has become increasingly more expensive and less supported by public funding or national governments. Fifty years ago, it was rare for research universities to have an annual operational budget of over one billion dollars, but now it has become the norm, and this figure is barely enough. The virtual research labs, electronic libraries, and world web internet services are all new requirements that universities must provide. Since no government can fully cover those expenses, universities are forced to tap other resources. This situation can be observed elsewhere in universities. In the United States, Michigan University, which moved from a public-supported to a public-aid university, is a good example. In China, Peking University is a government-supported university, which also receives special funding for its world-class building, but it has had to look for additional funding too. Financial constraint forces universities to seek other sources of support, typically from international corporations and organizations. The result, on the one hand, is that universities are very strategic in getting national governments to provide initial financing opportunities and facilitate the transfer of

Table 3.1 Regional distribution of global research universities

Ranking	America	Europe	Asian/Pacific	Africa
Top 10	8	2	0	0
Top 50	37	11	2	0
Top 100	68	33	8	1

technologies developed, while on the other hand, they are ready to commercialize their services. The current “privatization” of public research universities therefore becomes a global phenomenon.

Where are the global research universities? The recent development of worldwide university rankings has created such a chaos that university presidents are so much troubled if they are put at the lower end of the lists. Though the university rankings have been questioned and criticized, they at least could provide some insights on where the most advanced scientific knowledge are produced. Upon a careful review of those rankings, one can find some similarities among the universities listed at the top. The following Table 3.1 shows the regional distribution of those universities based on the Shanghai Rankings in 2011.

From the table, one can note that most global research universities are still located in North America and Europe. They grew out of the traditional research universities, but they differ from the traditional ones in many respects.

3.3 The Global and the Traditional Research University

In discussing the global research university, higher education historians review the development of the university from the medieval period through to modern society. However, the origin of the current global research university is quite recent. The concept of the traditional research university began in Germany in the early nineteenth century, developed with Humboldt’s vision of a new form of knowledge production through higher education. But Humboldt’s idea of research was quite different from the current concept of university research. The concept “*universitas litterarum*,” as Humboldt proposed it, was to achieve a unity of teaching and research for students with an all-round education. Humboldt’s Berlin University then pioneered the research-intensive model of university throughout the western world. The establishment of Johns Hopkins University in the USA during the late nineteenth century is a good example of how Humboldt influenced universities in North America. At the time, Daniel Colt Gilman, first university president of Johns Hopkins University, still viewed the research university based on the German model: namely, to promote research for the training of talents. But the mission of establishing universities in the USA is quite different from Humboldt’s idea. The basic idea of the Land Grant Act in 1862 was to authorize states to use public property to establish colleges and universities in helping local governments and people to help regional economic development and to solve the daily life problems of local communities.

When the American model of research university took shape, the philosophy behind it was the tradition of American pragmatism, of which is quite different from Humboldt's research university. Especially after World War II, when university research was recognized as important for national security, and when the American federal government started to involve research universities into the country's R&D system, many American research universities experienced a transformation. If Humboldt's vision of the research university is considered as the traditional type that continued for about two centuries in Germany, the current global research university originated from the concept of national capacity building in the United States after World War II. As Geiger (1986) states, the impetus for the global research university is the concept of national development planning and the concomitant expansion of science as a broad authority and economic asset in society.

The great difference between the traditional research university and the current global one is in their approaches to knowledge production and the commercial activity in which the university is engaged. Since the mid-twentieth century, scientific research has been focused not only on the development and acquisition of new knowledge but also on the transmission of this knowledge leading to productivity, whereas a focus on individual scholarship, which was once dominant in traditional research universities, has been transformed into large-scale scientific research with the "big science" as Galison and Hevly (1992) described.

The terms "dual integration" and "entrepreneurial science" are frequently used to describe the difference between the traditional system of creating knowledge and the new knowledge production priority. Currently, scientists and researchers are not only required to produce knowledge but they are also expected to commercialize the knowledge they produced (Ma 2009). According to the current concept of research, the global research university incorporates a belief that new knowledge leads to a better world, though the belief itself has to be testified. A good example of this "entrepreneurial science and international collegialization" is the announcement by Ford Motors that 12 universities have been awarded the company's 13 University Research Programs (URP). Those 12 universities are from different countries around the globe including Wayne State University in Detroit; Stanford University in Palo Alto, California, USA; RWTH Aachen University in Aachen, Germany; and Tsinghua University in Beijing, China. The research mainly deals with testing the properties of thermoplastics modified with nano materials, developing an in-vehicle safety alert system for diabetic drivers, and studying the environmental and economic impact of batteries for electric vehicles.

This international cooperation is indicative of the level of industry and university collaboration. Here, global reach in research universities is mostly in the service of international enterprises, as one of the senior staff at Ford put it: "Research collaborations are a driving force behind the innovations bringing consumers to Ford – and will be crucial to keep them coming back."¹ The benefit to Ford is quite

¹http://media.ford.com/article_display.cfm?article_id=33090.

clear, but what is the benefit to the universities and what is the benefit to those societies the universities represented? The current debate on the rises of knowledge workers (Kleinman and Vallas 2001) and academic capitalism (Slaughter and Leslie 1997) and public good and private benefits (Tilak 2009) in higher education are all closely linked with the entrepreneurship of the global research universities in scientific knowledge production.

3.4 The Global Reach of Research and Teaching Universities

As mentioned above, the birth of American research universities can be traced back to the end of the nineteenth century, but the real classification began in 1970, when the Carnegie Foundation published its criteria for different categories of universities in the USA. Although there have been several revisions of that classification, the basic definition of a research university is still based on the amount of research grant money from the federal government, the number of PhDs conferred each year, and the numbers of PhD programs a university provides. It has been taken for granted that those universities which can not meet the criteria are teaching universities. Currently, worldwide university rankings, driven by the growing number of international students, have neglected the function of teaching in universities and favored excellence in scientific research. It is commonly believed that teaching in the research university does not count for much in the academic reward systems in these institutions. Criticisms of research universities mostly focus on the faculty neglecting students in favor of spending more time on research. At the same time, the research university is becoming more and more entrepreneurial.

In the current financial crisis, competition for resources has pushed many universities, both teaching and research universities, going global. The term “transnational higher education” not only applies to global research universities but to the global teaching universities also. Research finds that the top US research universities such as Harvard, Cornell, Northwestern, Carnegie Mellon, Georgetown, and Georgia Institute of Technology have established research centers or branch campuses in other parts of the world. They can be found in the Middle East, Southeast Asia, and other areas. The trend of branching out can be found in community colleges and teaching universities too. For instance, Franklin (Ohio) University has developed global programs in Eastern Europe, India, and China. Arizona State University opened an office for international initiatives in the last few years and tried to develop joint degree programs with universities in China and other countries. Teaching universities include many categories in the United States. For example, they include community colleges, public state universities, liberal arts colleges, and technical colleges and universities. Statistics show that United States accounts for 50% of the branch campuses abroad, Australia accounts for 12%, and the UK for 5%. Almost 60% of campuses abroad offer both bachelor and master’s degrees (Marilyn 2009). Most of these branch campus activities are commercial ventures of teaching universities in other countries.

There are many reasons for the global reach of teaching universities. An important one is the global demand to prepare a labor force for economic globalization. But in teaching universities, the strength of going global lies not in research, but in vocational education and professional skills. Unlike the global teaching university, global research universities measure global reach by giving special attention to international PhD students and seeking the best minds worldwide to contribute to the university's research agenda. In addition, global research universities develop partnerships with the top institutions abroad, often in research rather than teaching, to expand their influence and intellectual capital in other countries.

Both Yale and Stanford have cooperative teaching programs in Peking University. Instead of establishing branch campuses, these universities created course programs for their undergraduate students on Peking University campus. By so doing they can make the best use of Peking university's resources to teach Yale and Stanford students. Here, internationalization of higher education has a different connotation for global research universities compared with global teaching universities. As discussed previously, the global research university focuses mostly on knowledge production and leadership training, while global teaching universities provide more access for international students in vocational training and skill acquisition. In relation, both research and teaching universities are strategic: the global research university focuses on excellence in research and knowledge production, while community colleges and teaching universities take the path of vocationalism and commercialism (Levin 2001).

3.5 The “World-Class Worldwide”

What is a world-class university? Many researchers tried to define it but still seems to be unclear. The concept actually called attention in 1998, when policymakers in China come up with the decision to build “world-class” universities. To implement that policy, Chinese national government set up a special grant for the two leading universities, increasing it to nine later, and now for 39 universities. The purpose is to increase research capacity of Chinese higher education. This in turn resulted in similar actions in many other countries. In 1999, South Korea adopted a policy called “Brain Korea 21,” which focused on the development of the creative and high-quality human resources necessary for a knowledge-based society. For this project, the national government in South Korea allocated a special fund to the graduate schools of leading universities. In 2002, Japan adopted a policy through a process of “legalization of public universities,” to make public universities largely independent of the national government in terms of their governance. The purpose was to increase efficiency and global competitiveness in Japanese public universities.

Now, South Korea's BK21 Project entered its second phase, and in China, the “985 Program” (a world-class building project) entered its third phrase. European countries also feel the urgency to increase their global competitiveness. In Germany, “the Excellence Initiative” was launched in 2005, aiming to promote top-level

research and to enhance the quality of German universities and research institutions. “The Initiative will make Germany a more attractive research location, more competitive internationally and will focus attention on the outstanding achievements of German universities and the German scientific community,” as it was described at the website. (<http://www.germaninnovation.org/research-and-innovation/higher-education-in-germany/excellence-initiative>). In order to understand the phenomena in Asia and Latin America, Altbach and Balan (2007) used the term “world-class worldwide” to indicate that elsewhere in the world, there are many new initiatives to build world-class universities.

In reading the descriptions of these projects initiatives, one can easily find that the core concern is to increase global economic competitiveness and capacity building for nation states through higher education. Though after a decade, there are still problems in defining “world-class,” a term first used in China but now recognized worldwide. If a research university is to be considered a category of self-defined universities, world class may refer to a class of educational institutions that have been recognized by the general public. From this understanding, a world-class university is equivalent to a global research university, which means a world-recognized global research university or world-class global research university. The popularity of worldwide university rankings shows the effect of the global classification of higher education. College rankings originated in the United States when the US News and World Report published its ranking list to provide information for high school students in selecting colleges, and the Carnegie classification was used to distinguish American universities. The current worldwide university rankings, which are mostly based on scientific research and global influence in research, serve a much wider audience. Policymakers, university presidents, and students all use the rankings as a point of reference for different purposes.

On how to build a world-class university, independent researchers, international organizations, and university presidents all seem to have their own ideas. In the case of China, Yale University president, Richard Levin (2010), through QS Asia Websites, proposed with three prerequisites, based on his experience in leading an American research university and on his understanding of Chinese higher education. He listed the adequacy of resources, the fair allocation of the resources, and the capacity to cultivate independent and critical thinking.

In relation to the first prerequisite, Levin believes that sufficient funding enables the university to offer competitive salaries to attract scholars and scientists of the highest quality. In the sciences, first-class research facilities and adequate funding to support research are the primary necessities. In the United States, this problem was solved in the 1940s by Vannevar Bush who drafted the paper “Science: The Endless Frontier” in March 1945. In the paper, he put up the proposal to the Federal government to allocate more research funding to basic research in universities. In addition, industry and society contribute billions of US dollars to American higher education, and much of this funding and the research contracts go to research universities later on. In China and other Asian countries, government funding for university research is relatively a new phenomenon. China has included university research in the national R&D system for approximately 20 years only. In most

cases, higher education in China lacks social and industry supports, because of the traditional distance between university and society in general. It is only in the recent decade, after mass higher education, some Chinese universities started to respond to social and economic development needs.

The second prerequisite refers to the building of research capacity by equitable use of limited resources. According to Levin, it is one thing to have the resource but altogether another to allocate the resource properly. He points out that a university needs extensive resources and that these must be allocated on the basis of scholarly and scientific merit, rather than on the basis of seniority or political influence. Drawing on his understanding of the Chinese academic culture, Levin points out the problems in resource use in Chinese universities. Chinese culture, in advocating blind obedience and order, creates an academic environment of seniority and academic favoritism both of which are unhelpful forces in world-class university building. In Chinese universities, seniority and academic favoritism comes in many forms, including administrative positions, academic titles, academic connections, and academic rank, to name a few. In point of fact, academic capacity is the least considered element in resource allocations.

To cultivate independent and critical thinking, Levin suggests that Chinese world-class universities must broaden their curricula and change their teaching pedagogy. In the United States, these problems were addressed many years ago through general education, elective curricula, and the teaching of problem-solving. In China, there is curriculum reform occurring, and the American model of general education has been used as a reference for that reform, but the original purposes and practices of general education changed once implemented on the Chinese campuses (Ma 2008). In other words, once a concept is transplanted from one culture to another, the meaning changes because of difference in understanding and the process of adaptation.

One may ask why developing countries should build “world-class” universities. Altbach (2007) points out that research universities generate growing enthusiasm worldwide, because many countries considered such institutions are the key to gaining entry into the knowledge economy of the twenty-first century. But given the social and cultural differences, can the American global research university model be transplanted to other cultures? The answer is yes, if the model is localized into the culture successfully, or no, if the model is directly implanted. Many researchers have responded to the world-class universities in the developing world to at least balance local growth with international appeal and to avoid blindly following the others.

3.6 The Global Reach of World-Class Universities

The recent financial crisis has brought many changes for global research universities. This is especially the case for public research universities in the USA and many other countries. Since they are public, they have to find a balance between elite research and mass access. That is one reason why, in the world rankings of

universities, private institutions are always listed at the top. Relatively speaking, a private research university has more academic autonomy in deciding its activities, especially in its global reach, and is more responsive and quicker in taking action. Public research universities by comparison have more obligations to the national government and local communities.

Meanwhile, “world-class” universities are not exempted from challenges or tensions either. Simon Marginson (2010) presents his observations concerning the issues; he pointed out five tensions. They are the tension between national perspectives and global perspectives; tension between elite research and mass teaching; tension between the sameness and diversity; tension inside the hierarchy of the most competitive global research universities; and tension between inside the hierarchy and outside the hierarchy. Marginson’s observation is mostly based on Australian higher education and on the US model, which put more emphasis on free competition in the global marketplace. It indicates that being a global research university does not only mean resources, prestige, and status but also more responsibilities and obligations. Many “world-class” universities in the developing countries are mostly public, so they have to show their concerns to equity and access, while fulfilling national development objectives (Ma 2011).

Developing knowledge and strengthening nations have been core concerns of many countries and regions for higher education reform or “world-class” university building. Recently, the Chinese government published “Outline of mid and long term education development plan (2010–2020),” which contains a clear message to the “world-class” universities in China regarding research capacity building and internationalization. Even the “world-class” universities themselves in China start to make their strategic planning to integrate different resources for capacity building and global reach. But one needs to keep in mind that global research universities are not trouble-free as Marginson summarized above; the tensions should be properly addressed and carefully managed. Especially for the “world-class” universities in China, in their capacity building for global reach, they have to be strategic in establishing the university’ goals and mission and acting accordingly.

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