Chapter 1

Key Trends Shaping Asian Higher Education
1.1 Introduction and Overview

Asia is a unique region with vast land, huge population, long history, and cultural diversity. Asia has experienced significant changes over the past three decades, and with it the higher education landscape has evolved. The economy of Asia has continued to grow despite significant disruptions from two financial crises. The geopolitical scenario has changed substantially in recent years. Developing countries such as China and India and regional organizations such as the Association of Southeast Asian Nations (ASEAN) and Shanghai Cooperation Organization have emerged as major economic and political powers. Moreover, the combined forces of rapid urbanization, pervasive globalization, and transformative digital technologies have drawn people, markets, work, and learning into ever-closer networks.

This chapter sets out to unpack the socio-economic and higher education and research contexts of AUA universities’ home countries and regions (Figure 1.1 and 1.2).
Furthermore, this chapter examines eight important trends that have shaped Asian higher education landscape over the past few decades. Instead of including all possible trends and influences here, a select set of trends are discussed based on the availability of internationally comparable, long-term evidence. This discussion should serve as stimulus for considering major tendencies that have the potential to influence the future of Asian higher education and the role of AUA within it, as well as the potential of Asian higher education to influence these broader trends.

The data source of figures in this chapter, unless stated otherwise, is the World Bank International Comparison Program database as of July 2017.

1.2 Key Trends Shaping Asian Higher Education

Trends 1: Economic Dynamism

Asian economic dynamism often refers to sustained economic growth. Even though the economic capacity differs between and within Asian countries, most have experienced rapid economic growth and industrialization either continuously for a

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1. Note for China data: In this report, unless otherwise noted, statistical data for mainland China are labelled as “China”, and data for Hong Kong SAR are labelled as “Hong Kong SAR”. China has 23 provinces, five autonomous regions, four municipalities directly under the Central Government, and two special administrative regions. Taiwan is one of China’s 23 provinces, and Hong Kong SAR and Macao SAR are two special administrative regions of China. China resumed its exercise of sovereignty over Hong Kong on 1 July 1997. China resumed its exercise of sovereignty over Macao on 20 December 1999. The term “Mainland China” refers to China, excluding Taiwan province, Hong Kong SAR and Macao SAR.
few decades or intermittently over the past half-century. In particular, East Asia has registered what is widely’s recognized as the longest economic booms in modern times: This includes the Japanese economic miracle from the 1950s, the economic uplift of the Four Asian Tigers of China Hong Kong, China Taiwan, Singapore, and Republic of Korea from the 1960s, and the strong impact of the economic boom in China since the 1980s.

Asia is the fastest growing economic region and the largest continental economy in terms of GDP purchasing power parity (PPP) in the world (Figure 1.3-1.4). China, India, and Japan are the first, third, and fourth largest economies by GDP PPP in the

Figure 1.3  GDP (Current US$) of China, Japan, India and Republic of Korea in 1995-2015

Figure 1.4  GDP (Current US$) of Selected Asian Countries and Regions in 1995-2015
world, respectively. Singapore registered as the world’s third highest per-capita GDP PPP (Figure 1.5). United Arab Emirates, Saudi Arabia, and Hong Kong SAR of China are among the world’s highest level of per-capita GDP PPP. Eight home countries of the AUA members—China, India, Japan, South Korea, Indonesia, Saudi Arabia, Thailand, Malaysia—have the largest economies in Asia in terms of both GDP PPP and nominal GDP. Also, United Arab Emirates, and Singapore are ranked among the largest Asian economies in terms of nominal GDP.

Notwithstanding inherent economic and developmental challenges, Asia is forecast to continue to enjoy economic growth over the coming decades. Rising domestic, regional and international demand and supply will continue to be fueled by population growth and structural transition, rapid urbanization, increased connectivity within and beyond the region, a larger and better-educated work force, and an expanding and increasingly affluent middle class.

**Trend 2: Demographic Transition**

Asia is perhaps most defined by its wealth of human resources. As the largest and most populous continent in the world, the Asia-Pacific region hosts 4.16 billion people or about 56% of the world population in 2015 in an area that covers about 23% of the land on earth. Asia hosts six of the world’s ten most populous countries: China, India, Indonesia, Pakistan, Bangladesh and Japan. The first three alone account for 40% of the world population.

This populous region is experiencing significant changes in the scale and structure of population. Asia’s population size has tripled in the last 65 years and is expected to add another 680 million by 2050. A demographic dividend defined
as an increase in per capita income could be attributed to such demographic transition. Asia has experienced sweeping demographic opportunity in terms of a falling share of youth population (Figure 1.6) with a rising share of working age population to support them since the 1970s (Figure 1.7). This demographic dividend has contributed to about 39% to 42% of economic growth in developing and developed Asia-Pacific countries from 1970 to 2010.  

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There are two main challenges to Asian’s development path. One challenge is the sheer number of young people, that is, 1.7 billion or more than half of the world under-25 population\(^3\). The other challenge is the transition to an ageing population, which is defined as having more older people than those in the workforce. China, Republic of Korea, and Thailand have just passed the peak of working age population in 2015 in terms of both size and share of age. Japan passed this peak in 1995 while South Asian and Southeast Asian countries such as India, Myanmar, Malaysia, Indonesia have two to three decades to leverage demographic dividends until the share of their working age population peak around 2040-2050.

The key to reaping a demographic dividend and advancing human development regardless of stages in demographic transition is to enhance employability through investing in quality education and skills training all along the path from education to employment. With an ageing population in perspective, it is especially important to rely on higher education to enhance people’s productivity across longer lifespans as well as to cater for the needs of an ageing population. Moreover, it is also important to empower more women to participate in the labor market, especially in high-skill and high-paying jobs. The key to reaping a demographic dividend and advancing human development regardless of stages in demographic transition is to enhance employability through investing in quality education and skills training at all stages along the path from education to employment to retirement.

**Trend 3: Rapid Urbanization**

Urbanization generally refers to the increase in the proportion of people living in towns and cities. Rapid urbanization has been both a driver and a result of economic and demographic growth across Asia. Urbanization in Asia is mainly driven by natural population growth, internal migration from rural into urban areas, and the reclassification of rural areas into urban areas. Whereas the majority of the world’s rural inhabitants live in Asia, urban population in Asia is growing faster than in any other region (Figure 1.8-1.9). Asian population is projected to reach 64% of total population by 2050\(^4\). In this way, Asia will continue to host nearly one half of the world’s urban population. Both ageing populations and rising migration, especially those with highly youthful migrants, highlight the imperative to redevelop urban infrastructure and services to meet the needs of current and future urban dwellers.

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Figure 1.8  Population Distribution by Size Class of Settlement and Region in 2016 & 2030

Source: UNDESA, Population Division (2016)

Figure 1.9  Annual Percentage of Population at Mid-Year Residing in Urban Areas in Selected Asian Countries and Regions in 1995-2030

Further, Asia hosts the world’s fastest growing cities. Seven of the ten most populous cities of the world are in Asia, namely Tokyo, Delhi, Shanghai, Bombay, Beijing, Dhaka and Kolkata. Overall, megacities (with populations over 10 million) and metropolitan areas (with populations between one and 10 million) account for 11% and 29% of Asia’s urban population, respectively. By 2025, the total number of megacities worldwide is expected to reach 37 including 22 in Asia. The fastest growth in city development since 2000 has come from medium-sized cities and cities with less than one million inhabitants located in Asia.

A pressing issue is that urban growth in many Asia countries is neither environmentally nor socially sustainable. Excessive consumption and production models of urban growth have caused “big city disease” with mounting issues such as poor air quality, clean water supply, waste and sanitation management, traffic congestion, and excessive competition due to scarcity of education and health services. Since most Asian universities are located in large and medium-sized cities, whereas sustainable campus development may contribute to sustainable urban development, the campus ecosystem is still conditioned and challenged by the wider physical and social urban space. Moreover, university education and research are crucial to talent and knowledge concerning government planning in cities and improve smart and sustainable urban governance and development.

**Trend 4: Holistic Human Development**

Human development has improved across the world since 1990, and South Asia and East Asia are regions that have achieved significant human development progress, according to the Human Development Report 2016 (Figure 1.10). The Human Development Index (HDI) measures achievements in health (life expectancy at birth), the standard of living (gross national income per capita) and education (mean of years of schooling for adults aged 25 years and more and expected years of schooling for children of school entering age). Supported by increased investment in education, the demographic window in Asia has contributed to raise the participation rate and improve equity in access to all levels of education. Strong early investments in education and health are well studied as a major force in driving the East Asia miracle of sustained economic growth and social development.

Most Asian countries have improved the literacy rates among the youth and achieved nearly universal primary education over the past few decades. In recent years,

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secondary education has expanded more rapidly in Asia-Pacific than in other world regions. East Asia has achieved universal coverage in lower secondary education and Southeast Asia and South Asia have also achieved about 80% in gross secondary school enrollment rate (GER). All AUA countries except for Sri Lanka have achieved over 70% in overall secondary GER. Japan and Republic of Korea had already achieved universal access by 1995, China and Indonesia have increased about 43% and 35% while Hong Kong SAR of China, Malaysia, Myanmar, Sri Lanka, and India have also increased around 20% to 30% in overall secondary GER from 1995 to 2014 (Figure 1.11).

Nevertheless, Asia is facing a challenge of sustaining universal primary education, scaling up enrolment in a diversified secondary and higher education sectors, and enhancing relevance and responsiveness of education in face of changing labor market need. In the context of more than half of the 18-24 years of age cohort still going to the labor market directly from secondary schools in Asia, increased enrollment in secondary education offers more options for employment and raises aspirations for pursuing further learning in tertiary education at different points in life. However, a challenge is to promote closer links between education and work and enhance relevance and responsiveness of education, especially through vocational and technical education in both secondary and tertiary sectors.

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Trend 5: Rising Global Presence

Many Asian countries have risen in their capacity to project themselves to the global scene though participating in the process of globalization over the past two decades. Several Asian countries have taken the lead among emerging countries in global presence among about 100 countries during the 1990-2016 period. China rose from the 13th place in 1990 and 2nd place in 2016. Thailand, Bangladesh, Singapore, and Malaysia have also rose significantly during the same period. They have become major world producers and exporters of manufactured goods. Although the rising power of Asia is primarily driven by the economic growth of China and India, it is also driven by the rise of soft power of many Asian countries in areas such as education, science, technology, and tourism.

Trends 6: Expanding Higher Education System

Higher education is a key national development strategy for many Asian countries. As Asia is rising in economic power, many Asian countries have adopted strategies to scale-up higher education systems through rapid enrolment expansion. In 1995-2015, the percentage improved in tertiary GER was 36%–47% in China, Republic of Korea, Saudi Arabia, and Singapore (Figure 1.13). This registered among the world’s fastest increase in tertiary GER over the past two decades. Moreover, during the same period the percentage improvement in tertiary GER also reached an impressive

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Figure 1.12  Elcano Global Presence Index Top 20 in 2016
Source: Real Instituto Elcano (2017).

Figure 1.13  Higher Education Gross Enrollment Rate in Selected Asian Countries and Regions* in 1995, 2005 and 2015 or Latest

* Data for United Arab Emirates and Myanmar are not available.

growth of 20%~29% in India, Indonesia, Japan, and Thailand and 10%~15% in Kazakhstan, Malaysia, and Sri Lanka.\(^2\)

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Asia has the world’s largest tertiary system in terms of total enrolment. Japan, Republic of Korea, Singapore, Hong Kong SAR of China, Saudi Arabia, Thailand, and big cities and wealthy provinces of Zhejiang and Jiangsu of mainland China have all entered the universal higher education system with over 50% of tertiary GER. China and India host the two largest national tertiary systems in the world. China reached 36.5 million in tertiary enrollment in 2015\(^{13}\), raising GER from 4.5% in 1995, 19.3% in 2005 to 43.4% in 2015 and aiming at reaching 50% in 2020. India reached 34.2 million in tertiary enrollment in 2015, raising GER from 5.5% in 1995, 10.7% in 2005 to 25.5% in 2015\(^{14}\). Among the countries with the highest tertiary GERs in Asia in 2014 are Republic of Korea (95.3%), Singapore (69.8%), and Japan (63.3%).

Major drivers of mass higher education development generally include rapid economic growth, societal systemic changes, and in some cases Confucian traditions\(^{15}\). Closely connected to these three factors are major demographic changes that are significantly shaping the demand and supply of education opportunities in Asia\(^{16}\). In China, for example, the share of 0-14 age cohort in total population dropped from 30.9% in 1985 to 25.1% in 2000, then 17.2% in 2015, while the share of 15-64 age cohort rose from 64.0% to 68.3% then 73.2% in the same period. During this time, education enrolment in China continued to expand, beginning with the primary sector in the 1980s to the secondary sector in the 1990s and then the tertiary sector since 1999. Between 1995 and 2015, new and total undergraduate enrollment in regular higher education sector in China expanded eight and nine times, respectively\(^{17}\).

Major challenges during and after scaling-up of higher education systems include: demand for increased funding from both public and non-public sources; stratification within higher education system and pressure for clear and creative positioning of individual universities within the system; increased competition for students and universities; regional and social disparities in access to and quality of education; misalignment between secondary schools and universities and between universities and the world of work, and; the imperative to reform and innovate leadership and governance at multiple levels.

It is worth noting that many Asian countries, such as Thailand, Kazakhstan, Malaysia, China, Sri Lanka, Indonesia, Myanmar, and Singapore, have higher female enrolment rates than male enrolment rates in tertiary education (Figure 1.14). This gender trend in Asian tertiary education reflects the global picture that the majority of countries now have more females than males in tertiary education. This trend manifests the progress in advancing girls’ access to quality education and women’s empowerment in recent years. Nevertheless, “gender equality remains a persistent challenge for countries worldwide and the lack of such equality is a major obstacle to sustainable development”\textsuperscript{18}.

**Trends 7: Rising Global Positions of Asian Universities**

As Asian higher education continues to expand, its global reputation rises with it. A diversity of rankings at national and international levels have proliferated ever since the first two, the Academic Ranking of World Universities (ARWU) by the Shanghai Jiaotong University in China and the Times Higher Education and Quacquarelli Symonds joint World University Rankings (THE-QS), were published in 2003 and 2004, respectively.

The concept of “world university rankings” has become part of the zeitgeist of higher education. Even though university rankings have received criticism

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concerning methodological robustness, objectivity, and transparency, the trend is that they are here to stay. The rankings have become an essential tool for global branding, ranking broadly refers to an approach to evaluating the universities’ positions in the international scene. The rankings offer an easy-to-communicate tool to evaluate a university’s position in the international scene and that of a national or regional higher education system, and to understand the characteristics of a leading university as compared to its peer group.

The rising global reputation of Asian universities is manifested by an increasing number of Asian universities breaking into, as well as moving upward in world league tables over the past decade, presenting a larger Asian presence in the global excellence in higher education. For example, the ARWU listed 15 Asian universities in top 100 (15% of world total) and 126 in top 500 (25.2%) in 2016, compared to only nine Asian universities in top 100 (9%) and 100 in top 500 (20%) in 200719 (Figure 1.15 and 1.16). A rising tide between 2007 and 2016 is that not only more Asian universities reached the top 500 group, but also more of them in each 100-ranking band as many of them moved up the ladder within this top 500 group.

The rich diversity of excellence among Asian universities is illustrated by the wide distribution of their home countries across Asia. The top 300 in THE Asian University Rankings are represented by 21 countries across Asia, including ten out of 12 AUA member countries: Japan (69), China (China mainland 54 and Hong Kong SAR 6), Republic of Korea (26), Thailand (10), Malaysia (9), Saudi Arabia (4), United Arab Emirates (3), Indonesia (2), Singapore (2), and Sri Lanka (1).

Figure 1.15  Asia-Pacific, Europe and North American Universities in ARWU Top 100

Trends 8: Relocating Research to Asia

Asia has experienced increases in the quantity and quality of academic research, driven by increases in the number of active researchers and investment in research and development (R&D). Asia is spending more than ever on R&D in terms of the proportion of R&D expenditure in GDP (GERD/GDP), employing more researchers and producing more publications, and Asia achieved the largest world share in these three aspects between 1996 and 2013/2014 (Figure 1.17).

First, strong growth in R&D spending reflects the growing acceptance of investment in science and technology as a driver of economic and social development. Hong Kong SAR of China, India, Republic of Korea and China doubled R&D and Malaysia tripled its national spending in R&D between 2000 and 2013. Republic of Korea had the world’s highest level of R&D expenditure in GDP at 4.15% in 2013. Japan, Singapore and Indonesia also have about 10% to 47% increase in R&D spending (Figure 1.18).

Secondly, strong growth in researcher intensity is exhibited in that India and Republic of Korea nearly doubled, Thailand nearly tripled, while Malaysia increased six times in the number of researchers in R&D per million people between 2006 and 2015. Republic of Korea with 7,087 per million people in 2015 and Singapore with 6,658 per million people in 2014 held the highest researcher intensity in the world, while Japan has maintained the level of close to or above 5,000 at least since 1996 (Figure 1.19).
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<table>
<thead>
<tr>
<th></th>
<th>Year</th>
<th>World</th>
<th>Asia</th>
<th>Asia’s share of world total</th>
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<tbody>
<tr>
<td><strong>GERD (PPP$ billions)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>790.3</td>
<td>213.9</td>
<td>27.1%</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>1,132.3</td>
<td>384.9</td>
<td>34.0%</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>1,477.7</td>
<td>524.8</td>
<td>39.2%</td>
<td></td>
</tr>
<tr>
<td><strong>Researchers (thousands)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>5,810.7</td>
<td>2,498.1</td>
<td>35.5%</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>6,400.9</td>
<td>2,770.8</td>
<td>39.0%</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>7,758.9</td>
<td>3,318.0</td>
<td>42.8%</td>
<td></td>
</tr>
<tr>
<td><strong>Total Publications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>733,305</td>
<td>177,743</td>
<td>24.2%</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>1,029,471</td>
<td>292,230</td>
<td>28.4%</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>1,270,425</td>
<td>501,798</td>
<td>39.5%</td>
<td></td>
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</tbody>
</table>

**Figure 1.17**  Research Capacity of the World and Asia in 2002-2014


**Figure 1.18**  R&D Expenditure as % of GDP in Selected Asian Countries and Regions in 2006 & 2015

* Year 2015 data in the figure were Singapore in 2014 and Sri Lanka in 2013.

**Figure 1.19**  Researchers in R&D per Million People in Selected Asian Countries and Regions in 2006 & 2015

* Year 2015 data in the figure were Singapore in 2014 and Sri Lanka in 2013. Year 2006 data in the figure were India in 2005.
Thirdly, Asia achieved strong growth in research output. The number of scientific and technical journal articles increasing 2.8 folds in Asia while the world total increased 1.7 folds between 2002 and 2014 (Figure 1.17). In the decade between 2006 and 2016, Indonesia grew 12.5 times in scientific and technical journal articles, Kazakhstan, Malaysia and Saudi Arabia grew about five to seven times, Myanmar increased nearly four times, China, Thailand, United Arab Emirates, Sri Lanka and India increased two to three times, respectively (Figure 1.20).

Malaysia presents a striking case in the development of higher education and academic research. Malaysia adopted the Vision 2020 Strategy (Malaysia: The Way Forward) in 1991 with the goal to transform the nation into a high-income knowledge-based economy by 2020. Key targets critical to achieve this vision include by 2020 to raise the proportion of R&D spending in GDP to 2%, raise the participation rate in higher education from 40% to 50%, to raise the share of science, technology and mathematics students at university level to 60% of the total, to create five Apex Universities with world-class excellence, and to become the sixth-largest global destination for international university students and increase the number of international students to 200,000. The Ministry of Higher Education was established in 2004 with the goal to meet the nation’s human resource development needs and make Malaysia a center of higher education excellence by the year 2020. The National Higher Education Strategic Plan beyond 2020 and the National Higher Education Action Plan 2007-2010 were adopted in 2007 and the Malaysian Qualifications Agency (MQA) were established in the same year. Between 2000 and 2013, Malaysia’s researcher density, scientific and technical journal articles and

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citations have increased impressively at both Asian and global scales. About 70% of Malaysia’s research publications were produced by the five research universities in 2005-2012, indicating the strength of the APEX strategy. Moreover, the global and Asian positions of five APEX universities rose markedly across 2014-2015 in the QS rankings.21

Notwithstanding these achievements, Malaysian tertiary GER rose from 30.3% in 2007 to 37.1% in 2010, and then fell to 26.1% in 2015.22 A significant budget cut in public universities followed the Malaysia Education Blueprint 2015-2025 (Higher Education) by the Ministry of Higher Education in 2015.23 The Malaysian government decided to move away from the blanket funding and block grants for public universities irrespective of performance in order to enhance financial sustainability and stimulate accountability, efficiency and revenue diversification while maintaining the level of spending per student in public institutions. By 2015 government grants funded more than 90% of the expenditure of public higher education institutions. The five research universities have been affected most strongly by the budget cut. For example, in 2016 the University of Malaya had the most severe cut of 27.3%, three universities had the cut of 11.4% to 17.1% while a single fifth university had a budget increase of 5.1%.24 Malaysian universities are undergoing a further budget cut of nearly 20% in 2017.25 This vision to transform Malaysia higher education in the coming decade and the bold actions of financial restructuring provide both a challenge and an opportunity to make far-reaching organizational and cultural changes within and beyond the higher education system.

Concluding Remarks

Asia is moving into the world’s center stage. This chapter set out the current scene of key trends to illustrate the diverse socio-economic and higher education contexts of AUA universities’ home countries. Economic dynamism, rapid urbanization, vast human resources in structural transition, and strong investment in education have


brought both opportunities and challenges to sustainable development in Asia. These have the potential to influence the future of Asian higher education and the role of AUA within it, as well as the potential of Asian higher education to influence these broader trends. It is important to recognize pre-existing and diverse social, economic, and educational settings and regional alliances for economic integration. This diversity encourages communication and collaboration among Asian countries. These regional factors will affect and contribute to the strength and dynamism of AUA, as well as offer some of the challenges that AUA must address in order to achieve its mission.
Chapter 2

Nature and Position of AUA Universities in the Global Context
2.1 Shared Mission and Extended Networks of AUA Universities

AUA universities are pillars of their nations and Asia as a whole. Many AUA members are among their nations’ first modern universities. Ten members trace their history from the second half of the 19th to early 20th century, and five members since the late 1950s. It is important to recognize pre-existing and varied socioeconomic and political settings, and regional alliances for economic integration, among other factors. These factors will affect and contribute to the strength and dynamism of AUA, as well as provide an insight into some of the challenges that AUA must address in order to be successful.

The combined institutional mottos of nine AUA members are a testament of the universal pursuit of the university for “truth, knowledge and wisdom”. The combined missions of all AUA universities highlight shared goals for world-class excellence in education and research, creative engagement with the broader community and global leadership in ways that serve the people, society, nation, Asia and the world (Figure 2.1).

Figure 2.1 Keywords Shared by AUA Universities’ Missions
Chapter 2  Nature and Position of AUA Universities in the Global Context

At the global level, AUA is well-positioned to connect with major universities from all corners of the world. This connectivity is facilitated through rich bilateral partnerships developed by individual AUA universities, and also through around 20 regional and international university associations participated by one or more AUA members (Figure 2.2). For example, the ASEAN University Network (AUN), a network of 30 universities in the ten ASEAN countries established in 1995, would not only enhance closer the existing partnership among five southeast universities in the AUA but also potentially strengthen the connection between ASEAN and non-ASEAN universities.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Name</th>
<th>Year of Founding</th>
<th>Number of Institutional Members</th>
</tr>
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<tbody>
<tr>
<td>AUA</td>
<td>Asian Universities Alliance</td>
<td>2017</td>
<td>15</td>
</tr>
<tr>
<td>CAMPUS Asia</td>
<td>Collective Action of Mobility Program of University Students in Asia</td>
<td>2010</td>
<td>43</td>
</tr>
<tr>
<td>APUCEP</td>
<td>Asia-Pacific University—Community Engagement Network</td>
<td>2010</td>
<td>87</td>
</tr>
<tr>
<td>ASPIRE League</td>
<td>Asian Science &amp; Technology Pioneering Institutes of Research and Education League</td>
<td>2009</td>
<td>5</td>
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<tr>
<td>SCO University</td>
<td>Shanghai Cooperation Organization University</td>
<td>2007</td>
<td>82</td>
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<tr>
<td>IARU</td>
<td>International Alliance of Research Universities</td>
<td>2006</td>
<td>11</td>
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<tr>
<td>GULF</td>
<td>World Economic Forum—Global University Leaders Forum</td>
<td>2006</td>
<td>27</td>
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<tr>
<td>AUN/SEED-Net</td>
<td>AUN/Southeast Asia Engineering Education Development Network</td>
<td>2001</td>
<td>40</td>
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<tr>
<td>BESETOHA</td>
<td>Peking-Seoul-Tokyo-Hanoi (four universities)</td>
<td>1999</td>
<td>4</td>
</tr>
<tr>
<td>APRU</td>
<td>Association of Pacific Rim Universities</td>
<td>1997</td>
<td>43</td>
</tr>
<tr>
<td>AGS</td>
<td>Alliance for Global Sustainability</td>
<td>1997</td>
<td>4</td>
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<tr>
<td>Universitas 21</td>
<td>Universitas 21</td>
<td>1997</td>
<td>25</td>
</tr>
<tr>
<td>AEARU</td>
<td>Association of East Asian Research Universities</td>
<td>1996</td>
<td>17</td>
</tr>
<tr>
<td>AUN</td>
<td>ASEAN University Network</td>
<td>1995</td>
<td>30</td>
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<tr>
<td>ASEAN-UNINET</td>
<td>ASEAN European Academic University Network</td>
<td>1994</td>
<td>80</td>
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<tr>
<td>APSIA</td>
<td>Association of Professional Schools of International Affairs</td>
<td>1989</td>
<td>70</td>
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<tr>
<td>FUIW</td>
<td>Federation of the Universities of the Islamic World</td>
<td>1987</td>
<td>46</td>
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<td>SEAMEO</td>
<td>Southeast Asian Ministers of Education Organization</td>
<td>1965</td>
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<td>ASAIHL</td>
<td>Association of Southeast Asian Institutions of Higher Learning</td>
<td>1956</td>
<td>198</td>
</tr>
<tr>
<td>ACU</td>
<td>Association of Commonwealth Universities</td>
<td>1913</td>
<td>535</td>
</tr>
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</table>

Figure 2.2  Selected Regional and International Networks Involving One or More AUA Members
There are several successful multilateral academic collaboration and exchange networks in Asia. The Collective Action of Mobility Program of University Students in Asia (CAMPUS Asia Pilot Program) is jointly created by the three national governments of China, Japan, and Republic of Korea in 2009. The substantial experience of four AUA members (Tsinghua University (Tsinghua), Peking University (PKU), the University of Tokyo (UTokyo), and Seoul National University (SNU)) in CAMPUS Asia Pilot Program would contribute to the AUA actions in student mobility, joint educational programs, and transnational quality assurance. The International Alliance of Research Universities (IARU) established in 2006 currently has eleven members including three AUA members (Nation University of Singapore (NUS) and PKU and UTokyo). Also, the Consortium of the World-Leading Technical Universities in Asia (the ASPIRE League) established in 2009 comprises five universities including two AUA members (Tsinghua and the Hong Kong University of Science and Technology (HKUST)). These overlapping universities networks may reciprocate each other and contribute to deepen communication and collaborations among its members. In addition, the two mainland Chinese universities, Tsinghua and PKU, would likely bring scholarships from China’s One Belt, One Road Initiative to contribute to academic mobility of the students of AUA members to and from China.

A successful Asian project in engineering education is the ASEAN University Network/ Southeast Asia Engineering Education Development Network (AUN/SEED-Net). It was officially established as a sub-network under the auspices of ASEAN University Network (AUN) in 2001, fully operated in 2003 and currently in the third five-year phrase (2013-2018) covers ten engineering fields. The Project aims to promote human resources development in engineering in ASEAN and collaboration and solidarity between academics and professionals mainly through capacity development of academic staff of Member Universities, academic networking among Member Universities in ASEAN and Japan, addressing common regional issues, and linkage between university and industry. The Project is mainly funded by the Japanese Government through Japan International Cooperation Agency (JICA).

Currently the network of AUN/SEED-Net consists 26 Member Institutions from ten ASEAN countries and 14 Japanese Universities. Five ASEAN Members (Singapore, Brunei, Thailand, Indonesia, Philippines) mainly host students while five ASEAN Members (Cambodia, Laos, Myanmar, Vietnam) mainly send students. The framework of AUN/SEED-Net encompasses four main types of activities: (1) master’s and doctoral degree programs for young academic staffs or prospective staffs of Member Institutions, (2) research programs for alumni, with industry or for common

regional issues, (3) mobility and networking within ASEAN region and Japan through international academic, ASEAN engineering journal and two-way visits, and (4) university-industry collaboration through promotional activities and training programs. Six AUA members have participated in the AUN/SEED-Net: NUS, Chulalongkorn University (CU), University of Malaya (UM), Universitas Indonesia (UI), University of Yangon (UYangon) and UTokyo.

### 2.2 Academic Excellence of AUA Universities

World-class university strategies are prominent in Asia because Asia nations in general hold a strong belief in the power of universities in nation building. The excellence initiatives in China, Japan, Singapore, South Korea, Malaysia, Thailand, Kazakhstan, and India, among other countries, either over the past two decades or over the past few years have yielded impressive results in driving Asia’s rising global visibility.

Thirteen AUA members are in the latest top 300 of THE Asian University Rankings 2017\(^2\), and twelve AUA members are in the top 1,000 of THE World University Rankings 2018\(^3\). Six AUA members have made a consistent presence in the THE World University Rankings top 100 since 2010 (SNU has entered the top 100 since 2012). Their 2017-2018 global positions are: NUS 22\(^{nd}\), PKU 27\(^{th}\), Tsinghua 30\(^{th}\), HKUST 44\(^{th}\), UTokyo 46\(^{th}\) and SNU 74\(^{th}\). Five of them have had marked increases in both their rankings and ranking scores. Comparing the performance breakdown by five main indicators in 2017-18 rankings, international outlook works as a global edge for NUS and HKUST but a major barrier for PKU, Tsinghua, UTokyo and SNU; industry outcome works as a global edge for PKU and Tsinghua but also a relative barrier for UTokyo and SNU. According to the 2016 performance breakdown by five main indicators, international outlook and industry outcome are two contrasting features: NUS and HKUST have a global edge in international outlook, PKU and Tsinghua thrive globally in industry outcome, in comparison, other AUA universities in the THE world top 100 have experienced major challenges in international outlook and industry outcome in terms of ranking performance (Figure 2.3 & Figure 2.4).

---


2.3 Academic Excellence by Discipline and Subject

AUA has a rich diversity of academic excellence. According to the QS World University Rankings by Subject 2016, nine AUA members are in the top 500 lists in each of five broad subjects, and eleven AUA universities have a total of 51 entries, including 31 entries from eight universities in the top 100, 15 in top 101-300 and six in top 301-500 (Figure 2.5). NUS, PKU, SNU and UTokyo are present in top 100 across five academic fields, while Tsinghua has four and HKUST and UM each has three academic fields ranked in the top 100.

With regards to excellence in subject areas, twelve universities are present in 52 out of 54 subjects with 289 centers of excellence in the world top 500. Five universities
have 22 subjects in world top 10 (Figure 2.6): NUS and UTokyo each has eight subjects in top 10, Tsinghua has four, and PKU and SNU each has one. Centers of global excellence are also found in UM in Arts & Humanities, Social Sciences and Engineering & Technology, Indian Institute of Technology Bombay (IIT Bombay) in Engineering & Technology and Art & Design, and Modern Languages and Chemical Engineering in CU.

AUA also exhibits strong leadership in the field of Engineering & Technology: Eight AUA universities in top 100 and eleven in top 500. AUA members are most represented in seven subjects: Mechanical, Aeronautical & Manufacturing Engineering, Civil Structural Engineering, Computer Science, Electrical & Electronic Engineering, Materials Science, Chemical Engineering and Environmental Sciences. Each of these subjects has nine to eleven AUA universities in top 500. AUA’s highest world rankings in Engineering & Technology are NUS at the 7th place, Tsinghua 10th, and UTokyo 11th.

AUA has a core academic strength in Social Sciences. Eleven universities are ranked in top 500 in this field. The highest world rankings in Social Sciences are NUS 8th and UTokyo 10th. At the subject level, center of excellence within this field are more dispersed compared to engineering. Around ten AUA universities are ranked in top 500 in the three subjects of Economics & Econometrics, Business & Management, and Accounting & Finance. In fact, nine AUA members that have Accounting & Finance and Business & Management in top 500 lists are all ranked above top 200.

In Arts & Humanities and Natural Sciences, around ten universities are ranked in top 500, and six are ranked in top 100 in each field. In Life Sciences & Medical Sciences,
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Figure 2.6  Twelve AUA Universities in QS World University Rankings 2016 by Subject


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**Figure 2.6** (Continued II)
two universities are ranked in top 500 while four are ranked top 51 or above in top 100 list. Physics & Astronomy, Mathematics, Biological Science, Medicine, and Pharmacy & Pharmacology are five subjects widely shared by nine to ten AUA members ranked in top 500.

Citation is a key criterion in measuring impact in various rating schemes. According to the institutional citation ranking of Essential Science Indicators (ESI), which measures the top 1% most cited publications in 22 broad academic fields in the most recent ten-year period, 13 AUA universities each hosts one to 21 academic fields with global center of excellence in March 2017 (Figure 2.7). This ranking measures the mutually reinforcing impact of the institutional output and prestige attributable to the affiliated researchers in a given field, whilst the recognition of affiliated researchers reflects the reputation of the institution itself. Both PKU and UTokyo exhibit distinctive breadth of global distinction as they each have 21 out of all 22 fields in the world top 1%; NUS and Tsinghua each have 20 and 19 fields respectively; CU, HKUST, King Saud University (KSU), and UM each have 10 to 14 fields.

### 2.4 Characteristics of Co-authored Publications of AUA Universities

A core strength of AUA lies in the dynamic networks of research collaborations within AUA and between AUA and the rest of the world major universities. This strength is essential because international research collaboration is a key driver of academic reputation and impact⁴. According to the journal *Nature*, “scientific collaborations,

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particularly international partnerships, produce some of the highest quality research, and the institutions and countries that produce the most high-quality science also tend to form the strongest partnerships. As the world becomes increasingly interconnected and interdependent, there are a number of issues that cannot be resolved by any one country or one discipline alone. Scholars and researchers across the disciplines from all parts of the world are joining forces to share expertise and resources in order to tackle big issues in science and society. Even a local solution to social economic issues, especially one with technological solutions, may well find global transferability in areas such as education, health, and urban development.

Moreover, internationally co-authored publications are an effective means to achieve stronger research impact. Citation metrics are crucial in world university rankings. The proportion of citation related benchmarks are 20% in the QS rankings and ARWU rankings, respective, 30% in the THE ranking, 50% in the US News rankings. In particular, internationally co-authored publication serves as an indicator of a university’s international impact in the THE rankings (2.5%) and the US News rankings (10%). In the “International Outlook” benchmark of the THE World University Rankings, internationally co-authored publication is calculated as the proportion of a university’s total research journal publications that have at least one international co-author and reward higher volumes over the past five years.

Firstly, with regards to collaborative publications within AUA (Scopus data), UTokyo and NUS each has co-authored publications with all other 14 AUA members, and PKU, Tsinghua, SNU, HKUST and UM have also built a high-volume of collaborative research outputs through extensive engagement with other AUA members. Tsinghua and PKU have the most intensive collaboration between any AUA members. These two Chinese universities have co-authored 3,302 publications by May 2017. UTokyo and SNU have the most intensive cross-national collaboration between AUA members, with 1,594 co-authored publications by May 2017. UTokyo and NUS have each co-authored publications with all other 14 AUA members.

Secondly, with regards to AUA’s collaborative publications in the world, Asia Pacific and Europe respectively accounts for one third of AUA’s total number of collaborative institutions through co-authorship in the world between 2012 and May 2017 (Figure 2.9 and 2.10). In particular, UTokyo, Tsinghua, PKU, NUS, KSU, and UM each has a network of about 3,000 to 4,000 co-authorship collaborative institutions across the


7. In case of two or more AUA universities share one academic partnership, one partner institution or co-authored publication may be counted repeatedly each time it appears in an AUA university’s collaboration list.
Asia-Pacific: The highest density of AUA’s academic collaborations is within Asia-Pacific institutions, with about 34% of collaborative institutions and 58% of co-authored publications. With regards to co-authorship within the region, University of Yangon (UYangon) has a high proportion of 98% and United Arab Emirates University (UAEU), Nazarbayev University (NU) and KSU has a proportion ranging from 24%
to 42%. The rest of the AUA members have 69% to 88% of total publications with, though not limited to, Asian-Pacific co-authorship.

Europe: Europe shares 34% of AUA’s collaborative institutions and 19% of AUA’s co-authored publications. Compare with other AUA universities, NU has a stronger collaboration with Europe with 45% of its collaborative institutions and 48% of co-authored publications.

North America: North America shares 20% of AUA’s collaborative institutions but produces 25% of AUA’s co-authored publications. Ten AUA members have 26% to 29% while four members have 15%-20% of co-authored publications with North America.

Middle East: KSU, UAEU and UM each has more than 8% of collaborative institutions and 20% to 36% of co-authored publications with Middle East and NU has 6% and 10% in collaborative institutions and publications, respectively. In comparison, the other eleven AUA members have about 4% in both collaborative institutions and publications.

Africa and South America: Overall, academic collaborations between AUA members and Africa and South America are sparse as compared with other world regions. The proportion of collaborative institutions and publications remain to be around 3%, respectively. Again, close proximity supports strong academic links between the Gulf States and North Africa. KSU and UAEU have 30% and 13% co-authored publications, respectively, with African institutions, particularly with Egypt. CU has 8% of co-authored publications. Malaya also has 7% in collaborative publications and 6% in collaborative institutions.
2.5 The Impact of Co-authored Publications of AUA Universities

Bibliometric analyses show that collaborative research outputs are important to enhance the impact of research publications. In particular, publications with international co-authorship or university-industry co-authorship are an effective means to achieve stronger citation impact. Citation metrics are crucial in world university rankings because three major rankings employ citation metrics as a heavyweight benchmark, for example, the THE rankings (30%), QS rankings (20%) and US News (50%). In particular, internationally co-authored publication serves as a direct indicator of international collaboration in the THE rankings (2.5%) and the US News rankings (10%). In the “International Outlook” benchmark of the THE World University Rankings, internationally co-authored publication is calculated as the proportion of a university’s total research journal publications that have at least one international co-author and reward higher volumes over the past five years.

Two bibliometric measures are employed to evaluate the citation impact of AUA members: (1) Citation Per Publication is computed as the number of citations of an individual publication accrued since publication. (2) Field-Weighted Citation Impact (FWCI) is computed as “the number of citations received by a document in the year of publication plus the following three years” divided by “expected number of citations for similar documents”. Similar documents are the ones in the same discipline, of the same type such as article, book or review and of the same age. An FWCI of 1 means that the research output performs just as expected against the global average, while more than 1 means that the output is more cited than expected according to the global average.

Figure 2.11 to 2.14 illustrate the publications of AUA members over the five-year period of 2012-2016 indexed by Scopus database (the size of each bubble reflects the corresponding value on Axis-Y in each figure). The two main types of co-authorship are distinguished by the identity of the joint author(s) from institutional to international spaces, or from university and industry spaces.

Openness in collaboration is a characteristic of AUA members. All AUA members have a substantial proportion of international co-authored publications, ranging from about 30% to 80% of their total publications in Scopus in 2012-2016 (Figure 2.11). AUA members have overall around 47% of publications with international co-authorship. In particular, nine out of 15 AUA members have a higher portion of international co-authored than any other type of publications (national only, institutional only, or single author).


Overall, internationally co-authored publications yield a markedly higher citation impact in terms of both Citation Per Publication and FWCI for each AUA member (Figure 2.13 and 2.14). The citation impact decreases from national co-authorship only to institutional co-authorship only then to single authorship.

Citation Per Publication: the widest gap is found between international co-authorship and single authorship, ranging from a factor of about 1.2 to 10.3; while the gap between national and institutional co-authorship is much narrower, ranging from 2.9 to -0.8.
Chapter 2  Nature and Position of AUA Universities in the Global Context

**Figure 2.13**  Citation-Per-Publication of AUA Universities by Type of Co-Authorship in 2012-2016

**Figure 2.14**  Field-Weighted Citation Impact of AUA Universities by Type of Co-Authorship in 2012-2016

FWCI: International co-authorship yields significantly higher citation impact above the global average (1.0) for all AUA members, ranging from 8% (NU) to 126% (Tsinghua and HKUST) more citations than the global average. The FWCI of more than half of the AUA members is higher than the global average, and the FWCI of most of the AUA members is higher than the global average in both “institutional co-authorship” and “single authorship”.

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Co-authored publications through university-industry collaboration represent only a small proportion of 2.1% of all AUA members’ publications in 2012-2016 (Figure 2.12). The universities with highest university-industry co-authored publications are UTokyo (4.3%), SNU (4.2%) and IIT-Bombay (4.1%) and Tsinghua (3.3%). Despite small in number, university-industry co-authored publications have a strikingly high citation impact even compared to that of international co-authorship (Figure 2.15 and 2.16). Citation Per Publication is 20.0 for university-industry co-authorship and 8.5

Figure 2.15  Citation-Per-Publication of University-Industry Co-Authorship of AUA Universities in 2012-2016

Figure 2.16  Field-Weighted Citation Impact of University-Industry Co-Authorship of AUA Universities in 2012-2016
for international co-authorship; the FWCI is 5.26 for university-industry co-authorship (indicating 526% above the global average) and 1.74 for international co-authorship. UAEU stands out in university-industry co-authorship with 49.6 Citation Per Publication and 18.61 FWCI. AUA members with much higher Citation Per Publication are KSU (29), University of Colombo (UColombo) (35.2), and NUS (28.8). AUA members with much higher FWCI are KSU (7.92), Colombo (6.31), and UI (6.01).

2.6 Innovation

Universities are increasingly indispensable in many innovation-related fields through turning their research findings to industrial and commercial applications. The Reuter rankings for the World Top 100 Most Innovative Universities evaluate the universities’ contribution to science and technology and impact on the global economy based on metrics about both research and patent10. 14 countries were represented in this league table in 2016, including five AUA members from four countries11: UTokyo(16th), SNU(30th), NUS(64th), Tsinghua(66th) and PKU(70th). Seven AUA members entered the Top 75 Asia Most Innovative Universities Rankings 201712: HKUST and IIT in addition to the five AUA members in the 2016 world rankings.

According to the most active patent fields based on the patent volumes in different fields, NUS, HKUST and IIT all have outstanding innovation strength in the field of chemicals, while UTokyo has the distinctive strength in Pharmaceuticals & Biotech, Tsinghua in Computer Software & Internet, and PKU in Semiconductor & Electrical Components. HKUST, PKU, Tsinghua and SNU achieved 60% to 80% of success in filing patent applications that were then granted. In terms of the ratio of the patents that have been submitted to global patent authorities (US, Europe, Japan and China), UTokyo had a high ratio of 36%, SNU, NUS, Tsinghua, HKUST and PKU maintained the ratio about 9% to 15%, and IIT-Bombay also achieved over 5%. This ratio means that inventions from these universities are aiming at the global market. All these global patents have the higher potentiality to be translated into global entrepreneurial opportunities.

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10. The ranking is a weighted result based on a variety of innovative indicators including Total Patents Filed, Patents Granted, Commercial Impact, Global Patents, Patent Citations, Patent Citation Impact, Percent of Patents Cited, Patent to Article Citation Impact, Industry Article Citation Impact, Percent of Industry Collaborative Articles and Total Web of Science Core Collection Papers.


Concluding Remarks

One major strength of AUA lies in the focused commitment and multi-faceted contribution that individual member universities can make from across Asia. AUA members are among the best universities in Asia, with centers of global excellence in a wide range of subjects. There is rich connectivity in complex co-authorship networks of collaborative institutions within AUA, and between AUA and the world. Academic collaborations in Asia Pacific have generated over half of AUA’s internationally co-authored publications, while North America and Europe together shares close to the other half. This connectivity has laid a solid foundation for the creation of AUA. It also points out the future direction for AUA.

Connectivity through academic collaboration is essential in driving world-class university development. Internationally or university-industry co-authored publications of AUA universities exert significantly stronger citation impact, as compared to that of publications with other types of co-authorship or single authorship. The scale and quality of co-authored publications make substantial contribution to a university’s world rankings. Co-authorship connectivity is often not a result of university’s central planning, but the spontaneous, persistent and collective efforts of research teams among AUA institutions and across the world. It is imperative for AUA to make strategic priorities in providing systematic stimulation to support co-authored publications through international and university-industry collaboration.
Chapter 3
Nature and Position of the AUA Members
3.1 Introduction

Higher education can be seen in terms of its contribution to supporting a country’s internal processes, international relations, and sustainable economic development, as well as in the ongoing competition in the global higher education market. Higher education systems and institutions, are often aligned with national development plans, regional integration developments, and foreign relations policies. South East Asian regional integration initiatives related to the establishment of the Association of South East Asian Nations (ASEAN) Community, which includes the establishment and strengthening of the ASEAN Economic Community (AEC), directs South East Asian higher education, and their respective institutions, to contribute to regionalization initiatives. Central and West Asian countries, characterized as oil and commodity exporting countries, are seen diversifying and directing developments into becoming knowledge-based economies. Similarly, depending on the state of a countries socio-economic development, Asian countries are transitioning and/or deepening their transition into knowledge-based economies.

The past two decades have seen a major worldwide shift in the role of higher education, particularly in Asia, and this has included the development of national government policies aimed at optimizing educational and higher educational resources for socio-economic development. From the long held human capital model to the increasing role of knowledge societies in advancement, shifts in market orientation in the higher education sector are apparent in the strategies and policies of many universities. In addition, university regional alliances that promise to strengthen and promote better access to and integration of higher education institutions exist in every corner of the world.

To support higher education systems in the global higher education market, various excellence initiatives have been established in several Asian countries including China (211, 985 and Double First Rate), Japan (Top Global University Project), South Korea (Brain Korea 21), Malaysia (APEX), Thailand (World-class
University Initiative), Saudi Arabia (Vision 2030) and United Arab Emirates (Vision 2021). Similarly, Hong Kong and Kazakhstan (e.g. HKUST and NU) have infused substantial funding for research and internationalization to increase visibility, competitiveness and attractiveness to international students, as well as to retain domestic students, in the global higher education market.

3.2 Asian Universities Alliance

Over the past decade, internationalization and the role of university networks in institutional collaboration has focused on knowledge exchange, student and staff exchanges and appointments, and research productivity. The impact has been seen and supported at institutional to global levels. Increased industry and government engagement in research and development functions especially in promoting knowledge and innovation and supporting national development plans is an emerging trend along with the social responsibility role of universities to address sustainable development, regional and global challenges.

AUA brings together 15 universities from different parts of Asia to form a creative collaboration to jointly address the challenges related to higher education and economic, scientific, and technological development across Asia. With a shared vision and identity, the AUA aims to serve as a platform to bring together various educational resources of the member universities while at the same time highlighting the need to strengthen collaborations among higher education, government, and industry. By developing existing links and forming new ones, AUA also aims to foster multi-cultural learning through improved educational and research collaborations.

Central Asia

Nazarbayev University

Nazarbayev University (NU) was established in Astana, Kazakhstan, in 2010, as an international research university. NU has five mandates: to transform education; to develop academic excellence; to develop research excellence; to create a new model for healthcare services and finally, to accelerate innovation and commercialization of research. Kazakhstan is moving rapidly to become a knowledge based economy, and is increasingly open to global markets. The nation aims to be in the top 30 most developed economies by 2050. NU is central to this mission. Within the university, students can study a wide range of undergraduate, masters and doctoral programs including: Medicine, Business, Public Policy, Education, Humanities and Social Sciences, Science and Technology, and Engineering.

NU was born global through its deep strategic research and teaching partnerships with top 30 global universities including: University of Cambridge, University of Pennsylvania, Duke University, University of Pittsburgh, University of Wisconsin
Madison, NUS, University College London (UCL), Colorado School of Mines and Warwick University. Since its establishment, the university has taken a determined approach to internationalization, as evidenced by its substantive agreements with universities globally, and the recruitment of over 400 international academic staff from 59 countries including: USA, UK, Italy, France, Canada, Australia, New Zealand, Russia, Ukraine and India. As one of its newest institutions, the School of Medicine was formed in 2014 and opened its inaugural Doctor of Medicine class in 2015. It follows a US-style medical program in partnership with the University of Pittsburgh, School of Medicine. Astana Business Campus, the new Science Park, reflects our wider focus in research, innovation and commercialization.

**East Asia**

**The Hong Kong University of Science and Technology**

The Hong Kong University of Science and Technology (HKUST), one of Hong Kong’s top public universities, was established in 1991. In spite of being a relatively young institution, HKUST has established itself as a dynamic international research university, and has been studied by scholars as a potential model of world-class university development. HKUST ranks 6th in the 2017 Times Higher Education Asia rankings. As of December 2016, HKUST has 14,208 students enrolled in 20 academic departments and divisions across four Schools and Interdisciplinary Programs Office. As a truly international research university, its 5,060 non-local students comprise 35.6% of its student population, received 578.4 million HKD in new research funding and sponsored 969 new projects during the period 2015-2016.

Furthermore, HKUST has an international network of over 360 partner universities and institutes to facilitate delivery of collaborative and/or joint programs and research, and enrich their students’ experience and global outlook. As such, HKUST is positioned to pursue its mission of advancing learning and knowledge through teaching and research, and achieve its vision of becoming a leading university with significant international impact and strong local commitment.

**Peking University**

Peking University (PKU), presently one of “Double First-rate” universities of China, was founded in 1898 as the “Imperial Peking University”. It was China’s first modern...


national university and also the first one with comprehensive disciplines. Beijing Medical University originally was the medical school of PKU before 1952. It became an independent Medical University during China’s Soviet higher education reconstruction in 1952, then re-joined PKU in 2000. This merge further enhanced PKU disciplinary offerings and helped make PKU a world-class comprehensive research university⁴, PKU ranks second in the 2017 Times Higher Education Asia rankings, and 29th in the 2017 Times Higher Education University Rankings. PKU has close to 43,000 students enrolled in various disciplines⁵, the university has 237 research centres and institutes including four national engineering research centres and laboratories, seven state key laboratories, and twelve national key laboratories⁶. In line with its internationalization strategy, 15% of its student population are international students while its Graduate School has also established relations with 128 higher education institutions in 40 countries. Based on its traditional emphasis on patriotism, progress, democracy and science, and guided by its educational standards of diligence, precision, factualism and innovation, the university continues to pursue truth and excellence, cultivates talent and academic prosperity, and serves China, society and the global community.

**Seoul National University**

Although Seoul National University (SNU), South Korea’s premier national university, was officially established as the first national university of Korea in 1946, its history dates back to the late nineteenth century. The establishment of the Legal Training School and the Seoul (Hanseong) Normal School in 1895, the Euihakkyo (Medical School) in 1899, the School of Agriculture and Forestry in 1906, the Nursing Education Division in the Great Han Medical Center in 1907, Keijo Imperial University (later renamed Seoul University) in 1924, and the Seoul (Gyeongseong) Music College in 1945 formed the Schools and Colleges of SNU. As of April 1, 2016, SNU has 28,630 students enrolled in various disciplines. The university has a total of 4,725 international students (for 2015). With 6 intercollegiate, 70 college, and 52 government-funded research institutes/centres, SNU undertook 3,498 government, industry, university and international projects and received 544,269 million Korean Won from various internal and external sources in 2014 and 2015 respectively. Furthermore, SNU also participates in the South Korean Government’s BK21 PLUS (Brain Korea 21 Program for Leading Universities & Students) with 38 projects groups and 70% of its faculty participating.

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Tsinghua University

Tsinghua University (Tsinghua), presently one of “Double World-class” universities of China, was founded in 1911 as “Tsinghua School”, a preparatory school for students to be sent by government to study in the United States of America. In 1928 and 1929 respectively, the name “National Tsinghua University” was adopted and its graduate school established. Tsinghua continuously evolved into a multidisciplinary polytechnic university specializing in training engineers in 1958 into a world class comprehensive research university especially after its mergers with the Central Academy of Arts and Design and the Graduate School of the People’s Bank of China in 1999 and 2012 respectively. Tsinghua ranks 3rd based on the 2017 Times Higher Education Asia Rankings and 30th in the 2017-2018 THE World University Rankings. Tsinghua has 41,670 students enrolled (as of 2016) across its 20 schools and 54 departments. It has 4,068 international students in 2016 across its programs and 276 international partnerships with world renowned universities and institutions around the world. Tsinghua has an annual research funding of 5 billion RMB yuan (about 0.8 billion US dollars) in 2016, including one third from the industry. This made Tsinghua has the highest research funding among Chinese universities. Tsinghua developed a new global strategy in 2016 aiming to build a global leading university of China. This strategy integrates the international dimensions of all of its other institutional strategies in education, research, institutional governance reform respectively, and also connects Tsinghua’s institutional strategy with three major national strategies to further opening up the education system to the world, to build world-class university and world-class academic disciplines, and to build entrepreneurial universities and foster entrepreneurship education.

The University of Tokyo

The University of Tokyo (UTokyo) is Japan’s oldest and premier national university. The university was chartered by the Meiji government in 1877 under its current name by amalgamating older government schools Tokyo Kaisei School and Tokyo Medical School. The university has earlier roots in modern educational and cultural institutions since the late 17th century. In 2004 all national universities in Japan became incorporated following the ratification of the National University Corporation Act. The University of Tokyo, or UTokyo in short7. UTokyo, a world-class research university, ranks 7th in the 2017 Times Higher Education Asia rankings. UTokyo has 27,847 students enrolled, with 2,888 international students across disciplines. The university has 10 Faculties, 15 Graduate Schools, 11 affiliated research institutes, 13 university-wide centres, and two

institutes for advanced study in three main campuses. The university has also established international partnerships and has more than 800 university-wide and departmental agreements and memorandum of understandings with universities and institutions across the world. With roughly 80.1 billion Japanese Yen of research expenditures during the fiscal year 2015, the university’s research significantly contributes to scientific developments, and solutions to society’s and various world challenges.

South Asia

Indian Institute of Technology Bombay

The Indian Institute of Technology Bombay (IIT-Bombay) a leading technical training institute in India, was established in 1958 and first set up with foreign assistance. In 1961, the parliament declared the IIT-Bombay as “Institutes of National Importance”, one of the five institutions that focus on the development of technical education in India. A leader in engineering education and research, the Institute attracts the best students nationally for both its undergraduate and postgraduate programs and admits on average, 1,700 students annually. IIT-Bombay has 50 academic departments and 30 centers and has produced more than 50,000 scientists and engineers since its foundation. Since 2012, IIT-Bombay has over 120 patents licensed and granted, and over 2500 sponsored projects. Interdisciplinary programs are also offered such as Educational Technology and Climate Studies, among others. An early implementer of the business incubation model in India, the success of its entrepreneurial cell set up in 1999 has since paved way to the establishment the Society for Innovation and Entrepreneurship (SINE) in 2004. A full-fledged business incubator, the SINE is a focal point for the translation of research innovations into entrepreneurial ventures. Various MOU collaborations are also set with universities in Asia, Europe and North America, while MOUs with various industries are also arranged for research collaborations.

University of Colombo

The origin of the University of Colombo (UColombo) dates from the merger of the Ceylon Medical College (founded in 1870) and the Ceylon University College (1921), which then comprised the University of Ceylon. Under the University of Sri Lanka Act 1 of 1972, all universities were brought under as the University of

Sri Lanka (USL), which made the University of Ceylon, Colombo as the Colombo campus of USL. However due to weakening autonomy, a Universities Act of 1978 maintained that all campuses under then USL will remain independent, therefore regaining the autonomy of the University of Colombo. As the oldest university in Sri Lanka, the university has nine faculties, seven Institutes, one campus, one school and 51 academic departments. The University’s current action plan (2013-2016) emphasizes the delivery of quality education and producing of competent graduates and the need to ensure that the university community reflects social responsibility. In order to achieve this, one of its objectives is to enable the differently-abled by providing educational and support for such group. A center for the differently-abled students that will house the needed resources such as braille books, text to speech software among others, is also proposed. For 2017, the University is ranked in the top 300 of BRICS and Emerging Economies Universities Ranking and ranked among top 1000 universities in the world for 2017 by Times Higher Education.

**South East Asia**

**Chulalongkorn University**

Thailand’s first institution of higher education, Chulalongkorn University (CU) was established in 1917 and initially had 380 students in four faculties located on two campuses. The university was named after King Chulalongkorn (Rama V), who laid the foundations of modern education in Thailand. The development of CU continued and for years 1934 to 1958, the improvement of undergraduate education was heavily emphasized, but it was not until 1961 when CU established its graduate school, which was then followed by the creation of related research institutes and centers. Currently, CU consists of 19 faculties and three colleges. As the year 2017 marks the beginning of its second century, CU has developed and implemented new strategies for 2017-2020 to achieve academic excellence according to its vision to become a world-class national university that generates the knowledge and innovation necessary for the creative and sustainable transformation of Thai society. CU has defined its role as a national research university by prioritizing research of an international standard that aim at finding solutions to national and global problems and encouraging the production of research that is attuned to and answers global trends in four strategic areas: Aging society, Sustainable Development (Food, Energy and Water), Inclusive Community and Smart City and Digital Economy & Robotics.

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Chapter 3   Nature and Position of the AUA Members

National University of Singapore

The National University of Singapore (NUS) with a shared history with the University of Malaya, started out as a medical college, the King Edward VII College of Medicine in 1905. In 1962, the Singapore campus of University of Malaya became an autonomous university known as the then University of Singapore. With the merger of the University of Singapore and Nanyang University, NUS was established in 1980. NUS is the oldest higher education institution in Singapore and the biggest with 38,000 students enrolled and an offering of 56 Bachelor’s degrees and 150 postgraduate degrees and diplomas in 2016\(^4\). It is also the top performing university in Asia in the THE Asian University Ranking. Internationalization and networks play a focal role at the NUS, which has over 300 partner institutions in over 40 countries for their student exchange programs. The university has also established the Centre for Community Engagement for greater University Social Responsibility function. This USR profile has since then benefitted more than a thousand families under the Neighborhood Health Service since 2008, and has raised over 6 million Singapore dollars under the Rag and Flag USR program since 2000.

Universitas Indonesia

Established in 1849, Universitas Indonesia (UI) is a modern, comprehensive, open-minded, multi-culture, and humanism campus that covers wide arrays of scientific disciplines. With 14 academic faculties, two graduate schools and one vocational program, UI is distinctive among research universities in its commitment to the academic invention and research activities through various scientific programs. UI produces more than 400,000 alumni and continues its important role both nationally and internationally. The core objective of UI is to produce high quality of education system, global standard research activities and maintaining high standard of international academic research publications as well as addressing the need of world community. On 2017-2018 UI is ranked 277th on QS World University Ranking and 67th on QS Asia University Ranking.

University of Malaya

The University of Malaya (UM), Malaysia’s premiere university was founded in September 1905 as the King Edward VII College of Medicine. Upon merger with the Raffles College on October 1949, it then became the University of Malaya. The Carr-Saunders Commission Report in 1948 which recommended UM’s establishment noted the university’s role in providing “for the first time a common center where varieties of race, religion and economic interest could mingle in joint endeavor”\(^5\). Two autonomous divisions were set due to the rapid development of the university, one in Singapore and the other in Kuala Lumpur. Legislation was then passed to establish the national

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university in 1962. UM ranks as one of the top performing universities in Asia. Over the recent years, emphasis on internationalization and strengthening of research activities has set the development of the university. International students play a major role in this trend where close to 4,000 students coming from over 70 countries are enrolled\(^\text{16}\). Named as one of the five research universities in the country and with a total research funding of over 347 million Malaysian Ringgit over the recent years, and 863 patents, copyrights and commercialized technologies, UM continues to be a major player in the higher education sector in the region.

**University of Yangon**

The University of Yangon (UYangon) was established in 1920 and is a member of the ASEAN University Network (AUN). The University currently consists of 13 departments and Universities’ Research Center. The change of political dynamics in Myanmar in 2011 has seen a regained degree of autonomy to the University and has since opened it to the international academic community. In 2013, it welcomed back undergraduates for the first time since the 1980s\(^\text{17}\). A number of partner institutions have also collaborated with the University while scholarships from the private sector are also awarded to deserving Myanmar students to pursue higher education in the university. The University promotes an open academic culture where no gender, religious or any other forms of inequity exist. It speaks of a higher education institution, which is a “meeting place for our cousins from many different national groups living in the country”\(^\text{18}\). With the rapid improvements happening in the country, the university serves as one of the major and crucial focal points for human resource development.

**West Asia**

**King Saud University**

Established in Riyadh in 1957, King Saud University (KSU), the Kingdom of Saudi Arabia’s first higher education institute, was established as a response to the educational and professional needs of a young nation. In 1961, through the proclamation of Royal Decree No. 112, KSU became an independent university with its own budget, and given the responsibility for higher education, promoting scholarly research and advancing the sciences and arts in the country. Since its establishment, the University has achieved regional and international stature and is considered as one of the leading research and teaching university in West Asia\(^\text{19}\). The University ranks the 4\(^{th}\) in Times Higher Education

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Top University in the Arab world in 2015-2016. KSU has 55,650 students, 8.3% of which are international students, enrolled in 19 colleges in the sciences, health and humanities, three female colleges, and two community colleges in 2016. Playing a significant role in Saudi Arabia’s and its neighbours’ economic, social and political life, and committed to becoming a breeding ground for innovation and creativity, the university is on track to achieving its vision “to be a world class university and a leader in building the knowledge society” through the optimal use of technology and effective international partnerships.

**United Arab Emirates University**

United Arab Emirates University (UAEU), the oldest and flagship university in the United Arab Emirates, was founded in 1976 by Sheikh Zayed Bin Sultan Al Nahyan. The University aims to be a comprehensive research-intensive university, and envisions “leadership and innovation in higher education, research and community service at national and international levels”\(^\text{20}\). The University ranks the 5\(^{th}\) in Times Higher Education Top University in the Arab world in 2015-2016. During the academic year 2015-2016, UAEU has 13,810 students enrolled across disciplines, including 16% international students. Focused on developing innovative and sustainable solutions to challenges faced by the United Arab Emirates, the region, and the international community, the university’s research focus on seven strategic areas: renewable energy, transportation, education, health, technology, water resources and space exploration\(^\text{21}\). UAEU’s seven research centers, the Emirates Centre for Energy and Environment Research, and the UAEU Science and Innovation Park support it. UAEU’s institutional development and its expanding partnerships should contribute to the United Arab Emirates Vision 2021 “to be amongst the best countries in the world by 2021”\(^\text{22}\) and its own goal of being world-class research university.

### 3.3 The Role of Higher Education

As innovative leaders in Asian higher education, the AUA universities aim to play a major role in greater socio-economic development of their countries. This role involves innovative research and development, greater enhancement of networks and internationalization, high quality education, competent and highly competitive graduates, and the promotion of greater social responsibility. It is hoped that AUA will improve the broad and distinctively Asian higher education landscape and exert

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a positive influence on higher education across the world directly and indirectly. The role of each AUA university, however, differs based on each country’s and sub-region’s political, socio-economic and cultural contexts as well as initiatives for regional integration.

There are five ASEAN universities in the AUA namely, CU, NUS, UI, UM and UYangon. These are higher education leaders in their respective countries. They bring a unified yet distinctly ASEAN higher education features to the organization. The trend to a competitive and dynamic ASEAN marks for this distinctive contribution including bringing quality education and training exchange at this level through the strong research and training orientations of NUS and UM, to the pronounced role of universities in national development, as emphasized by the CU and UYangon. Equally important is the emphasis of universities in community engagement, as reflected for instance through the commitment for sustainable development by the University of Indonesia.

This is occurring also in the context of the 2015 establishment of the ASEAN Economic Community (AEC) which has created various broader initiatives to ensure a regional development that will deliver a more integrated and competitive ASEAN. Founded in 1967, ASEAN today encompasses ten dynamic economies: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. These economies are at vastly different stages of development but all sharing strong growth potential. Being one of the most compact regions in the world, ASEAN has a population of nearly 640 million people and a combined GDP of US $2.56 trillion in 2016. This makes ASEAN the third most populous and the fifth largest economy in the world. With more than half of its population aged below 30 years of age, ASEAN leverages the importance of higher education and the labor market in the region. Celebrating its 50th anniversary in 2017, ASEAN through its broader AEC objective has equally emphasized the strategic and significant role of its higher education sector for national and regional development. Various alliances and quality frameworks are observed within the ASEAN to ensure that its universities are able to respond to the challenges set forth by a rapidly developing region.

The youngest member university on the one hand, the NU in Kazakhstan, brings the perspective of a Eurasian/Central Asia dimension to the AUA. Given its very recent establishment, NU showcases the fundamental features of a forward-looking university, with the ideal of bridging knowledge and innovation for overall advancement while at the same time making certain that the strides of the university reflect the needs of the community. The strong internationalization feature of NU also highlights to the AUA the modern university as shaped by an increasingly globalized and interconnected world.

It is also important to note how higher education is affected by the wider economic
and political contexts of countries. The rapid economic development of China, the development of Myanmar, the advanced economies of Japan and South Korea, and the resource-rich economies of Saudi Arabia and the United Arab Emirates all impact on their higher education sectors. For instance, higher education in China\(^\text{23}\) and Myanmar\(^\text{24}\) are seen to take a role in sustaining their respective social and political positions. Relatedly, international student exchanges, scholarships, and training is being used to improve international relations among trade partners and among political alliances.

In economically developed countries, such as Japan and South Korea, higher education is geared towards reducing the skills gap, relevance to the labor market, and in attracting highly-skilled labor through higher education. Such is the case for the University of Tokyo, the NUS and the SNU (Japan, 2013; MOE-Korea, 2015; MOE-Singapore, 2012). While both Saudi Arabia and the United Arab Emirates as major-oil exporting countries, seek to leverage its resources to diversify their investments and become a knowledge-based economy\(^\text{25}\). As such, higher education is also seen to support professionalization of its government structures, and facilitate and support entrepreneurship, as exhibited by both the KSU and the UAEU. With the increasing competition in the global higher education market, estimated at 43.06 billion US dollars in 2013 and forecasted to be at 65.83 billion US dollars in 2019, countries are increasing their efforts to take a share of this growing service industry\(^\text{26}\).

**Concluding Remarks**

The roles of higher education include developing and disseminating knowledge, improving international relations, and supporting the broader call for sustainable development, among others. Given the variety of social, economic, and cultural factors across AUA countries, much is to gain from the diverse higher education response in terms human resource development, government restructuring initiatives, and/or developing novel approaches to drive innovation-based development. The


increased competition in the global higher education market has influenced each AUA members’ interest and position in the sector. Combined, however, they are major industry, including as a way to create and to attract the highly- skilled and qualified human resource from across the world. AUA paves the way for greater resource mobilization amongst member universities to support respective institutional missions as relevant to their national development goals and pursuing cooperation and greater region-building across Asia.