

The image features a central blue square with the text "Higher Education Index" in white. The square is surrounded by a background of various grey arrows pointing in different directions, some overlapping the square. The overall design is clean and modern, suggesting growth and progress.

Higher Education  
Index



## Preamble: Higher Education

Higher education<sup>1</sup> plays an important role in human development, contributing to the creation of new knowledge, transferring this to students and fostering innovation and creativity in society. Higher education institutions play a vital role in the production and diffusion of knowledge through teaching, scientific research and development. They also play a significant role in the preparation and creation of the human capital upon which the labour market depends for necessary skills. The roles of education and education institutions are also central to building the skills and knowledge of graduates, enabling them to satisfy the needs of industry and the economy in meeting work and production requirements. As such, they facilitate economic and employment opportunities, contributing to economic growth and development.<sup>2</sup>

The emergence and proliferation of the term “knowledge economy” has multiplied the value of higher education, which has become an important resource in the knowledge economy and an essential factor in increasing the competitiveness of countries. According to the World Bank’s *Annual Report 2000*, higher education is becoming increasingly important with the emerging significance of knowledge, increasing the capacity for development and competitiveness by providing young people with necessary skills.<sup>3</sup> In addition, according to the *Arab World Competitiveness Report 2013* higher education is one of the primary axes of the internal effectiveness of any economy.<sup>4</sup>

The role of higher education institutions is not restricted to economic aspects; it also nurtures societal values, maximising the spirit of citizenship, stimulating community involvement<sup>5</sup> and strengthening the foundations of democracy and justice by building the capacities of graduates in relevant fields. Higher education affects the quality of life and shapes the cultural behaviour of individuals and society.<sup>6</sup>

The UNESCO *Position Paper on Education Post-2015* indicates that ensuring access to

higher education opportunities is a challenge that all countries must work to resolve, particularly where a lack of higher education opportunities has resulted in a knowledge gap with serious repercussions for levels of social and economic development.<sup>7</sup> However, the challenge facing higher education in the Arab countries goes beyond the expansion of enrolment opportunities in order to keep pace with growing social demand; the real challenge is higher education’s inability to provide relevant and quality services that keep pace with the actual human capital requirements of economic development.

This is not a new finding, as many reports have come to the same conclusion in recent decades. *The Arab Human Development Report*<sup>8</sup> criticised the situation of higher education in the Arab countries, as did a report by the World Bank.<sup>9</sup> In its examination of the capacity for higher education in Arab countries to secure both the knowledge and human capital essential to respond to the various requirements of economic and social development, the *Human Development Report 2009* concluded that the available data indicate a lack of specialised human capital that can meet the needs of development. For example, in the Arab countries the lack of balance in the distribution of graduates in specialised fields indicates that higher education does not produce the qualitative human capital required for development efforts. In other words, governments have prepared graduates without ensuring that they possess the necessary skills for success in practical life. In addition, governments have not laid the economic groundwork in the fields of employment and production to attract graduates. Higher education institutions produce many graduates who do not have access to real work opportunities, while labour markets lack graduates in many disciplines.<sup>10</sup> The relationship between higher education institutions and labour markets is very important, as it can support economic and social development efforts, facilitate the creation of new knowledge, develop research and create a new generation of leaders able to integrate into the global knowledge economy community while maintaining prevailing language and cultural foundations.<sup>11</sup>

Another World Bank report described the quality of further and higher education in developing countries, including Arab countries, as “meagre”.<sup>12</sup> Hence, this stage is often not considered a valuable learning phase for life and life-long learning or a means to development. This situation may be difficult to change in the near future in a context where traditions of educational, organisational and financial arrangements in developing countries have combined to provide public services that suffer from fragmentation and isolation. In such a context, students think that a university education, when completed, is an educational stage that entitles them to public sector employment without consideration to the continuous development of their knowledge and skills. It therefore transpires that graduates’ skills do not comply with the requirements of the labour market, as they consider education to be a means to access employment without consciously considering their learning. This is compounded by a lack of foresight on behalf of institutions in linking education and knowledge with development. The World Bank report summed up higher education challenges in developing countries as comprising: poor funding when demand increases year after year; poor preparation of instructors and teachers, with low levels of motivation and income; weak curricula; and monotonous teaching methods.<sup>13</sup> Despite the need for developing countries to exert considerable effort in catching up with developed countries, the picture looks bleak in terms of opportunities to supplement the efforts of higher education development. This does not apply to a very small number of Arab countries that have managed to achieve good growth rates, such as some of the Gulf States.

International reports also spare no effort in providing advice on trying to correct the trajectory of higher education in Arab countries. The *Arab Human Development Report 2002* emphasised the importance of higher education as a driving force for development efforts and advancement. The report called for a serious review of higher education systems in Arab countries and suggested moving in three directions: strengthening human capacity, strengthening the relationship

between education and economic and social institutions, and reconsidering higher education programmes in the Arab region as a whole.<sup>14</sup> It could be argued that the image of higher education in the Arab region has changed greatly since the beginning of the twenty-first century; admissions have increased, as has the variety of programmes offered, while reliance on public university education systems has decreased. Due to the impact of global trends, most Arab countries have adopted a policy of economic liberalisation, following the example of the neo-liberal model in light of the effects of globalisation, expanding the process of higher education privatisation and the introduction of branches of foreign – often Western – universities in the Arab region.

The latest *Arab Knowledge Report*, which focused largely on higher education systems in the Arab region, stated that Arab universities suffer from inappropriate instructional methods, a severe deficiency in scientific research policies, and outdated academic curricula that do not keep pace with current knowledge requirements.<sup>15</sup> The introduction of a private sector in higher education with an interest in financial gains at the expense of graduate education quality and efficiency has more negative than positive impacts on development efforts. The expanding establishment of branches of Western universities, specifically in the Gulf countries, will help to keep pace with modern science through interdisciplinary courses and contemporary teaching methods. This may create inconsistencies, however, as some outputs produced in these universities are not in alignment with the culture of the community or the preservation of cultural heritage. This may result in gaps in skills and scientific knowledge among certain groups of graduates, considering that the majority of those enrolled in these universities are international residents whose populations outstrip those of citizens in some Arab Gulf countries. Higher education will therefore establish differences between traditional national universities and advanced foreign universities.<sup>16</sup>

The significance of efforts in the Arab region to expand higher education as a necessity

imposed by development requirements is not in doubt. However, these efforts remain unproductive unless they are supported by similar efforts to improve the quality of both the educational processes provided and their outputs. Consequently, Arab countries, particularly at the beginning of the twenty-first century, have sought to bolster the quality of higher education through the establishment of quality assurance bodies. In 2007, they established the Arab Network for Quality Assurance in Higher Education (ANQAHE) with support from the World Bank. However, such bodies are administrated by governments and often lack autonomy; their potential appears limited when it comes to the assessment of higher education. It could be argued that quality assurance institutions are managed as an extension of government agencies, resulting in the loss of their autonomy and discouraging the fundamental reform of the higher education system in the region.<sup>17</sup>

These national and regional institutions have failed to produce established methodological approaches to follow up and evaluate the higher education sector in the region. ANQAHE is working to facilitate information exchange on quality assurance through conferences, workshops and reports.<sup>18</sup> Accreditation and quality bodies in the Arab countries accredit institutional and academic programmes,<sup>19</sup> but do not provide national reports and accurate information on the state of higher education in these countries. Also absent are national and regional indices for higher education in the Arab countries that rely on reports issued by international institutions such as UNESCO and the World Bank or international indices such as the Knowledge Economy Index (KEI) issued by the World Bank, the Economic Competitiveness Index (ECI) issued by the Global Competitiveness Forum, the Global Innovation Index (GII) issued by the European Institute of Business Administration (INSEAD) and others.

In light of the lack of mechanisms in the Arab region to assess the state of higher education and its ability to contribute to development, UNDP partnered with the Mohammed bin Rashid Al Maktoum Foundation to launch

this initiative to develop the Arab Knowledge Index (AKI). This Index is crucial in light of the cultural and social peculiarities of the Arab region that other knowledge measurement indices may not take into account. Among the benefits of the AKI is that it contributes to the description of the current state of higher education, which helps researchers and decision-makers analyse the results and develop policies that will target and overcome the disadvantages detected by the Index. The AKI may contribute to setting aspiring yet achievable targets, instead of being driven by global goals that exceed the capacities of the Arab countries.

## Methodology for the Selection and Development of the Higher Education Index

### Adopted Methodological Instruments

The first step in developing a Higher Education Index was to conduct a desk review of international reports and databases relevant to this sector, as well as reports concerned with knowledge in general. These include the World Bank reports on knowledge economy, UNESCO's databases and reports, World Economic Forum (WEF) reports on global competitiveness, GII reports and the UNDP Human Development and Arab Knowledge Reports. Through these reports, the working team for the higher education sector reached a preliminary proposal for an index with multiple axes to ensure that the proposed index would include all dimensions addressed by previous international indices. The proposal adds new dimensions that have not been addressed by these indices, yet are important for the Arab region, such as the knowledge, behaviour and moral capital of graduates of higher education included in the current index.

The first draft of the Index was presented at a meeting of the core team of authors for the composite index on knowledge. After receiving observations and recommendations, the higher education sector team implemented the amendments and presented the draft again to the central team for thorough examination.

In the next step to determine the validity of the Index, the working team, with the participation of a group of experts and specialists in education, sought to produce a draft of the Index at a workshop held in Dubai on September 10, 2015. During the workshop, the experts examined the relevance of the Index's components and the text that defined each component. The workshop also sought expert agreement on the optimal formula for the weights of each sub-axis. Based on expert recommendations and suggestions, some paragraphs were deleted, others were added and further paragraphs paraphrased. The workshop came to an acceptable wording for the weights for each sub-component of the Index and the experts agreed on this wording. After the amendments had been applied, the Index was carefully examined again through individual consultations with three specialists in writing indices from UNESCO's Institute of Statistics, the UNESCO Institute of Educational Planning and the Arab League's Educational, Cultural, and Scientific Organisation (ALECSO).

### **Important Indices Currently in Use at the Regional and International Levels**

In a key UNESCO study (2011) on the development of an index for higher education, Michaela Martin and Claude Sauvageot introduced a practical guide for the development of this Index. According to this guide, subdivisions of an index are affected by what they intend to measure. For example, if university education system operations are to be assessed and analysed, the index can be divided according to resources (such as human and financial resources), activities and results.<sup>20</sup> A description of the social and cultural environment of the university education system may be added. This division is among the most widely accepted. In some cases, there is a possibility to differentiate between direct results and the impact of education when the index is developed. This means that the index result is a direct measure of university education, and the impact index measures the consequences of university education for the individual and society. Institutions that employ this division include the Ministry of Higher Education and Scientific Research in

France and the Organisation for Economic Cooperation and Development (OECD).

The French model divides the Higher Education Index into four sections: 1) expenses, including some sub-indices; 2) employees; 3) activities such as enrolment rates, rates of international students and ratios of females to males in higher education; and 4) the results of university education – e.g. graduation rates, the level of education according to the economic level and the percentage of graduates who gain employment.

In October 2010, Oliver Labe of UNESCO's Institute of Statistics delivered a workshop on the calculation and interpretation of higher education indicators. He divided these indicators into four types: input indicators such as teaching staff and related expenditures; access and participation indicators such as enrolment of inbound and outbound mobile students; output axes such as graduation rates, numbers of graduates and attainment; and other indicators such as school life expectancy, gender parity and human development.<sup>21</sup> UNESCO's website indicates the importance of considering the total enrolment rate when determining patterns of enrolment in higher education. This should be combined with the enrolment rate for female students as a separate indicator because a significant percentage of females remain deprived of, or excluded from higher education.<sup>22</sup>

UNESCO also recommends taking into account the rising contribution of the private sector in this type of education by considering its rate of enrolment. In terms of the graduation indicator from higher education, it must be considered through the rate of those completing undergraduate studies, disciplines of study, and female enrolment in disciplines historically dominated by males, such as science and mathematics. UNESCO also indicates the importance of observing the flow of inbound and outbound students to study in a given country in relation to the total number of students in higher education. The KEI, adopted by the World Bank, is based on four indicators or sub-areas: the economic and institutional system;

education; information and communications technology infrastructure; and the creativity and innovation system.<sup>23</sup> Three university education sub-indices fall under the education index: enrolment rate, regardless of age, to the total population of the age group that is of university age; graduation rate for all those over 15 years old who have completed their university studies; and graduation rate of females over 15 years of age who have completed their university studies.<sup>24</sup>

According to the Economic Competitiveness Index (ECI) issued by the Global Competitiveness Forum (GCF), higher education and training are considered the fifth axis of competitiveness and are measured by three dimensions: 1) the quantitative dimension measured by the rate of student enrolment in secondary education and the rate of student enrolment in higher education; 2) the quality of education measured by the quality of science and mathematics teaching, the quality of management, and the intensity of Internet usage in educational institutions; and 3) in-service training measured by access to training and research services and the availability of trainers.<sup>25</sup>

The GII 2014 adopted the input and output approach, and included higher education as a sub-index of inputs within the human capital and research index.<sup>26</sup> The Higher Education Index includes rate of students enrolled in higher education, graduates of the engineering and science disciplines and internally mobile students. The GII 2012 added the rate of students studying abroad and measured knowledge as outputs through three sub-indices: the creation of knowledge, its impact and dissemination.<sup>27</sup> The creation of knowledge included also the number of domestically registered patents, the number of patents registered worldwide, registered application models and scientific and technical research published in peer-reviewed journals, while the GII 2014 added cited research. In the GII 2012, the index of knowledge impact was measured by four sub-indices: the rate of worker productivity growth, the intensity of new businesses, computer software spending and ISO 9001 quality certificates. The GII 2014 added a sub-index of information,

communication, and computer export services as a percentage of total trade.

In terms of the Knowledge Diffusion Index (KDI), the innovation indices of 2012 and 2014 measured the KDI using the same indices: royalty and license fees receipts as a percentage of total trade, technological exports as a percentage of total exports, communication, computer and information exports as a percentage of total trade, and Foreign Direct Investment (FDI) net outflows as a percentage of gross domestic product (GDP). It is noticeable that all indices related to knowledge diffusion are associated with high-level technology, which is an important innovation tool.

According to this quick review of indices that focused on higher education and knowledge, it is clear that there is agreement on the need to avoid considering the higher education sector through its outputs only. In their attempts to assess and measure the adequacy of this sector, experts and researchers focused on its inputs, processes, outputs and environment. However, the dominant feature of the indices is that they are clearly influenced by the particular goals that every organisation seeks to achieve. For example, UNESCO is interested in female enrolment, the rate of private sector participation in higher education, the rate of female enrolment in courses historically known as male-dominated and the rate of student flow due to its importance in cultural diffusion and in strengthening peace. The GII focused on technological knowledge and patents more than on the education that leads to this knowledge, and viewed the sub-index of knowledge diffusion through a trade perspective exemplified in exports on communications and information, and FDI. Other indices, such as the Knowledge Economy Index and Global Competitiveness Index are not inclusive. In these indices education appeared as a sub-section. The representation of education in these indices is therefore not in keeping with the significance of this sector to a knowledge-based economy (for example, it would not be possible to judge the contribution of the education sector in building a knowledge-based economy without

enrolment and completion rates), or useful in supporting countries to compete economically (how can the role of education in economic competition be known without determining what role graduates are likely to play in the labour market?). It can also be argued that the association between knowledge and higher education is not a major goal of these indices. Herein lies the importance of developing an index to measure knowledge in the higher education sector in the Arab region.

Constructing an Arab Knowledge Index on higher education faces some challenges, including the large number of sub-indices that some consider vital, and the difficulty of collecting data on these indices, particularly if newly introduced indices have not been previously used by international organisations. The differences in interpreting these indices also pose a challenge if these indicators are not described accurately. The Arab countries' tendency to consider higher education through the comparison and ranking of countries is a challenge of inherent sensitivity. The fear here is that countries are compared to each other without considering the ultimate goal of the Index, namely the exploitation of its data in real terms and attempts to access policies and procedures for index development. The work team is aware that the Index itself does not give a comprehensive image of higher education in a country, as knowledge cannot be limited to quantitative data. In addition, the goal of higher education is greater than that which may be measured by graduation rates, or by achievement of particular knowledge, skills and attitudes. Higher education aims to build an integrated professional and human personality. A scientific committee assigned by the National Research Council in Washington (2012) to submit a proposal to measure higher education productivity pointed out that identifying higher education level appears to be a challenging task. This is because the evaluation process of the performance of higher education institutions remains incomplete, as it is difficult to identify the inputs, processes and outputs of higher education through a codified quantitative approach. In addition, the evaluation of higher education institutions through quantitative methods alone – such as spending

and graduation rates – disregards quality. Consequently, efforts to improve qualitative measures of higher education must continue.<sup>28</sup> The development of an Arab Knowledge Index must also contend with the challenge of overlapping sub-indices. For example, research and development are considered sub-indices of the general knowledge index. These sub-indices also overlap with research productivity at universities as one of the sub-indices of the Higher Education Index. Finally, some may believe the use of secondary data collected by other organisations is a shortcoming of the Index, but it may be an inevitable solution, particularly in the first phase of constructing the AKI.

### The Proposed Higher Education Index and the Reasons for Its Selection

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The desk study concluded that there is no existing index that measures knowledge itself in higher education, but there are indices for higher education and knowledge. Knowledge may be implicitly included as a part of the Higher Education Index by monitoring the number of patents and published scientific papers, and so forth. The AKI of higher education integrates these two sectors.

Measuring the effectiveness of the higher education system and its relationship to knowledge is based on the connection between knowledge and development. Higher education institutions prepare human capital to become effective in knowledge, skills or societal and economic fields to a high degree. Hence, human capital would possess a set of qualifying values that enables it to integrate into society and contribute to its development. The effectiveness of the higher education system is measured by R&D production that aims to develop knowledge and support the economy and social functionalism. This only happens in an inspiring context for the acquisition and production of knowledge. Consequently, the Higher Education Index will not be limited to education outputs, as some suggest, but will present knowledge in a more comprehensive sense in the context of its production and enabling



environments. The following is a diagram of the Index's components.

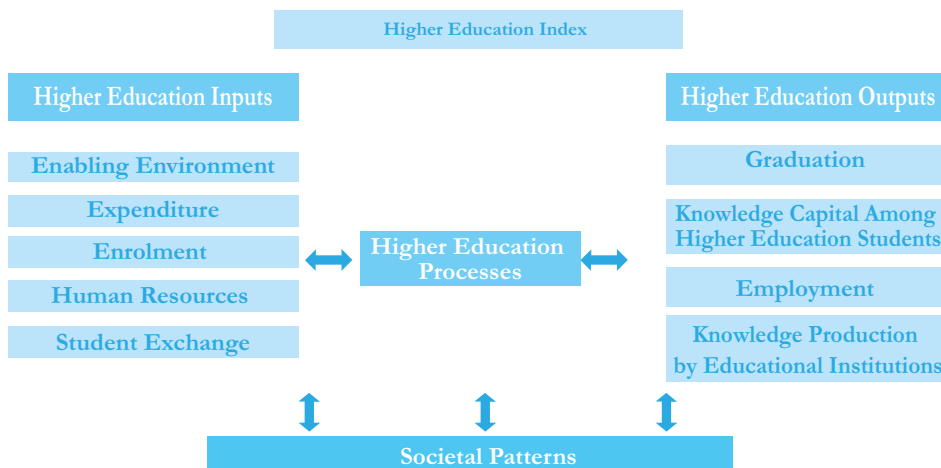
### Index Components and Justifications for Their Selection

Based on the previous framework, the proposed Higher Education Index is divided into inputs, processes and outputs. The input sub-index includes the enabling environment, material resources, enrolment or registration rates, human resources and student diversity. These inputs are then carried over through higher education system processes that are characterised by quality. The output sub-index is composed of graduation or completion rates; post-graduation employment rates; knowledge, cultural, social and economic efficiency, and its relevant values among university graduates - also known as the knowledge capital of university students; and finally, knowledge production at higher education institutions, particularly in the field of inventions and research. This whole system works in a societal pattern, which has some attributes that mutually affect and are affected by higher education.

The choice of the three major axes of the Index (inputs, processes and outputs) takes into account international indices that study the effectiveness of higher education systems and their significant role in stimulating knowledge for development. The sub-indices

were carefully chosen to give a true indication and assessment of each major axis. For example, the input-related sub-index includes sub-axes such as enabling environment, material resources, enrolment or registration rates, human resources, and student diversity. These axes have important implications besides the fact that international institutions take them into account when measuring higher education inputs. For instance, the enabling environment – with its specific indices for political and financial stability – and government efficacy are considered important indicators for enabling higher education institutions to perform their role. This applies to financial and human resources, which are significant indicators in judging educational system effectiveness and its ability to contribute to the production and diffusion of knowledge. Student diversity, which includes the presence of foreign students in the Arab countries or Arab students in foreign countries, is an important axis. These students will impart new knowledge as well as life or cultural experiences that not only contribute to the dissemination of knowledge in general but also promote values of tolerance and acceptance of others. As for the quality of the educational system processes, no real knowledge is possible without a good system for teaching and assessment, programmes that are subject to review and approval, and institutions using sophisticated technology. Axes related to higher education system

**Figure 1:**  
**Components of the Higher Education Index**



outputs are similar to international indices for graduation, employment and scientific production, as well as new additions resulting from dialogues and consultations with experts, such as undergraduate completion rates within a specified number of years, and the rate at which graduates are employed in their fields one year after graduation, which were both added due to prevailing unemployment rates in the Arab region. Knowledge capital of higher education students in the Arab region may come as an important addition to the indices related to knowledge and higher education. This axis has not appeared in any international measurements or indices, perhaps due to the difficulty of measuring it. However, the UNDP's knowledge evaluation of university students in four Arab countries, presented in its 2014 report, is a motivation for including this axis.<sup>29</sup> Hence, the knowledge capital of higher education students, their knowledge, skills and values gained by the time of graduation are among the significant outputs measured that distinguishes the AKI's coverage of higher education.

### Proposed Weights of the Index Components

In the workshop on the AKI of higher education, experts examined the specificities of this Index in terms of the weights that should be given to its various axes or particulars. The research team considered giving equal weights to the 10 particulars of the Index, where each section is given one of the 10 levels allocated to the Index, while the experts considered giving more weight to the outputs, being the direct knowledge outcome in this Index. For example, the axis of spending on higher education as an indicator of concern about this type of education is important, but the students' knowledge, skills

The first four inputs of the higher education system (enabling environment, spending, enrolment and human resources) have also been allocated equal weights in the input-related value of the sub-index, whereas the student exchange axis (also a part of the inputs) gained a rate of one-third. This is because student exchange, both of outbound and inbound students, is important in forming and shaping Arab knowledge. The axis of the system's processes and their quality was given 10 per cent, because students' experiences in a good educational system allow them to gain knowledge, skills and values that they may transfer to their society. Regarding the weights of higher education system outputs, the values differed as well, with the greatest value (two-thirds) given to what the experts considered to be the direct effect of this education that touches both sides of development: the axis of knowledge capital possessed by university students and the axis of university knowledge and research production. Experts considered that number of graduates, despite its importance, does not represent substantial value if not coupled with employment and development. Thus, this axis was given 8 percent of the output sub-index value, whereas consistent employment and transfer of knowledge gained from education were granted more importance. Accordingly, this axis was given 25 percent of the output-related sub-index value.

### Expert Observations on the Index

Experts realised that the importance of the higher education axis in the broader knowledge index was determined by the extent to which this sector contributed to knowledge processes and knowledge production, and therefore the great expansion

Proposed Weights of Various Index Components			
Axis	Higher Education Inputs	Higher Education Processes	Higher Education Outputs
Percentage	30%	10%	60%

and values have greater relative importance, as they show the actual output of education that directly contributes to development efforts. Participants agreed that weights for each axis would be as follows:

in monitoring inputs and processes of this sector may not be very useful. The large number of axes affects the quality of the Index as a whole because it contains data that is not directly related to the measurement of

the extent to which universities and higher education contribute to the production of knowledge. There are two observations in this regard: the Higher Education Index not only seeks to focus on outputs, but also aspires to provide an image of this education in the framework of its environment and context. The desired benefit of this is the capacity of every country to assess its situation in terms of the different axes within the Index and to identify its strengths and weaknesses; but if the Index focuses only on the outputs, the image may seem incomplete, especially because most international indices also show interest in the environment and societal context. Emphasising the importance of the higher education system's outputs, the second observation is that the outputs indicator, composed of four sub-axes, holds the greatest weight of the Index at 60 per cent; while the six axes of the inputs and processes are worth 40 per cent of the Index.

The experts also noticed that the higher education sector differs from the pre-university education sector in terms of the nature of the former's institutions and their participation in knowledge production. The pre-university education sector has a national character and is the government's responsibility, unlike higher education, which is of a predominately institutional character. Many of the latter sector's institutions (even the public ones) enjoy varying degrees of financial and administrative autonomy. These institutions also vary and differ in terms of their outputs. It is noteworthy here that the Arab region includes many countries, and one cannot make the generalisation that their governments bear the sole responsibility for providing pre-university education due to the private sector's efforts in this regard. In the United Arab Emirates, for example, there were twice as many private schools in Dubai in 2010/2011 as public schools, and the number of students enrolled in the former represented 87 per cent, most of whom were expatriate students. Consequently, it is difficult to count on the public education system as a unit of analysis and comparison within the Higher Education Index. Hence, most sub-indicators include both the public and private higher education sectors.<sup>30</sup>

Participants also noted that the Index dependence on data collected from various sources (UNESCO, the World Bank, national sources, etc.), each with its own procedural definitions, may significantly affect the Index's credibility. Because it is likely impossible to collect original data for all the Index's axes at present, the AKI relied on the data of international institutions. In the future, the Index will depend mainly on original data obtained from official statistical bodies and institutions and from similar knowledge reports.

## Conclusion

The Higher Education Index includes 10 sub-components, each of which is measured by a number of sub-indicators to reach a total of 83. Other global indices measure higher education with a limited number of indicators. Therefore, careful consideration should be given when comparing the results of the Higher Education Index for the Arab countries to those of global indices. It is not fair, for example, to compare the higher education indicator within the GII that measures this sector through three sub-indicators – enrolment rates, graduation rates in science and engineering, and student exchange – to the AKI's indicator of the higher education sector measured by 35 sub-indicators. Similarly, it would not be fair to compare the results of the Higher Education Index to the KEI, which only measures higher education by average male and female enrolment and graduation. However, there is a similarity between the results of the AKI's indicator for the higher education sector and global indicators. The Arab countries that reached the top positions in the higher education sector's indicator were also at the forefront of the higher education indicator for the Arab region in the GII 2015,<sup>31</sup> and the Global Competitiveness Index (GCI) 2015–2016, which measures the sector of higher education and training as a sub-indicator of competitiveness using different variables.<sup>32</sup>

The significance of the higher education sector cannot be denied, being one of the most important sectors for the development

of human capital and knowledge production in any society. This sector's indicator included many axes, but the lack of available data has been noted, particularly in the axes of quality of the higher education system, graduates' knowledge capital and knowledge production at higher education institutions. Consequently, concerted efforts are required to collect data

for unavailable indicators. Based on the abundance of data and the ease of obtaining them, work should be carried out to develop the Index in the coming years by modifying the Index's sub-indicators so that its value truly reflects the status of the higher education sector.

## Endnotes

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1. The World Bank defines higher (tertiary) education as “all post-secondary education, including but not limited to universities. Universities are clearly a key part of all tertiary systems, but the diverse and growing set of public and private tertiary institutions in every country - colleges, technical training institutes, community colleges, nursing schools, research laboratories, centers of excellence, distance learning centers, and many more-forms a network of institutions that support the production of the higher-order capacity necessary for development” (World Bank 2013). For the purposes of constructing the current Index, higher education will only be considered in terms of public and private higher education institutions offering BA/BS stage programmes and what follows from Level 6 for the first university degree, 7 for the Master’s degree, and 8 for the Doctoral degree, according to UNESCO’s International Standard Classification of Education (ISCED).
2. Wilkins 2011.
3. World Bank 2000.
4. World Economic Forum and the European Bank for Reconstruction and Development 2013.
5. Wilkins 2011.
6. UNDP & Mohammed bin Rashid Al Maktoum Foundation 2014 (reference in Arabic).
7. UNESCO 2014.
8. UNDP 2003 (reference in Arabic).
9. World Bank 2008b.
10. UNDP & Mohammed bin Rashid Al Maktoum Foundation 2009 (reference in Arabic).
11. Wilkins 2011.
12. Hargreaves & Shaw 2007.
13. World Bank 2000.
14. UNDP 2002 (reference in Arabic).
15. UNDP & Mohammed bin Rashid Al Maktoum Foundation 2014 (reference in Arabic).
16. UNDP & Mohammed bin Rashid Al Maktoum Foundation 2014 (reference in Arabic).
17. Wilkins 2011.
18. Arab Network for Quality Assurance in Higher Education 2012 (reference in Arabic).
19. Commission for Academic Accreditation. 2011.
20. Martin & Sauvageot 2011.
21. Labe 2010.
22. UNESCO Institute for Statistics 2014.
23. World Bank 2012.
24. World Bank 2011a.
25. World Economic Forum and the European Bank for Reconstruction and Development 2013.
26. Cornell University et al. 2014.
27. INSEAD & WIPO 2012.
28. National Research Council 2012.
29. UNDP & Mohammed bin Rashid Al Maktoum Foundation 2014 (reference in Arabic).
30. Knowledge & Human Development Authority 2011.
31. Cornell University et al. 2015.
32. World Economic Forum 2015a.

