



Higher Education Index

Introduction

Higher education¹ today serves as a catalyst for improving economic competitiveness,² sparking innovation, and promoting knowledge production and dissemination within society, especially among youth.³ Research indicates that the more a country invests in higher education and the quality of its outcomes, the greater progress it achieves in developing a knowledge-based economy. Countries therefore seek both to increase the capacity of the higher education sector and to enhance the quality of its operations and outputs, with a view to stimulating development,⁴ and improving the welfare and wellbeing of individuals.⁵ This may be achieved by shifting towards student- and development-oriented programs,⁶ offering more specialized training and promoting lifelong learning.⁷

Despite broad agreement on the vital role of higher education, only a very limited body of literature exists that presents an objective assessment of this sector in the Arab region, while statistical and analytical data is often outdated or missing. Hence, there is a need for reliable evidence to inform decision making on how best to develop this sector and optimize its structures and processes. This requires additional, updated, and reliable information on higher education.

A culture of self-evaluation plays a central role in the success of higher education institutions in developed countries. This culture is not only weak in the Arab region, but there is also a major deficiency in the mechanisms that track and evaluate the outputs of higher education institutions.

Inspite of the establishment of national accreditation bodies in several Arab countries, as well as the Arab Network for Quality Assurance in Higher Education⁸, there is no periodical publication or database that provides information and analysis of the state of higher education in the region. Consequently, Arab countries have no alternative but to adopt the tools and analyses of international organizations.

International organizations such as the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Organisation for Economic Co-operation and Development (OECD) recommend monitoring and evaluation of higher education institutions as a means of improving the quality of the sector.⁹

Several countries have established initiatives to monitor the quality of higher education institutions. These programs are either country-specific, such as in La Agencia Nacional de Evaluación de la Calidad y Acreditación (ANECA) in Spain¹⁰, or of a wider scope such as the global network of research universities, Universitas 21, launched in Melbourne and providing an annual ranking of national higher education systems across 50 countries based on a system of 25 indicators.¹¹

In the United States, the Voluntary System of Accountability (VSA) is a similar program managed jointly by the American Association of State Colleges and Universities (AASCU) and the National Association of State Universities and Land-Grant Colleges (NASULGC).¹² The VSA seeks to evaluate learning outcomes, and allows comparison between public colleges and universities in terms of student performance, life on campus, faculty-to-student ratio and other criteria.¹³

Such initiatives reflect an increasing awareness of the importance of monitoring higher education, but existing university rankings have significant drawbacks. Firstly, as indicated by UNESCO they tend to use leading universities as a benchmark for evaluating others.¹⁴ Secondly, whilst available rankings may provide information on leading universities in a specific country in comparison to others, they do not reflect the quality of the broader higher education system or country-specific challenges.¹⁵ This applies to some of the world's most famous university rankings – such as the Shanghai Jiao Tong University's Academic Ranking of World Universities (Shanghai Ranking), Quacquarelli Symonds' QS World University Rankings, the Times Higher Education World University Rankings and the Webometrics Ranking of World Universities. As a result, policymakers tend to overlook

local specificities in their attempts to improve the performance of national universities in international rankings.¹⁶

In response to this, UNESCO's *Position Paper on Education Post-2015* discusses how higher education institutions can adapt to emerging challenges by developing a scorecard that balances the achievement of global goals and individual countries' ambitions.¹⁷ The paper adds that this approach necessitates an assessment of the knowledge, skills and competencies required at the individual level, as well as a reconsideration of educational processes, policies and reforms at the system level.

In this context, the OECD published a feasibility study on developing international standards for measuring the knowledge and abilities of undergraduate students (The OECD Initiative for an Assessment of Higher Education Learning Outcomes [AHELO]). The study focuses on the development of indicators that take into consideration country-specific contexts while also enabling comparison between countries. It recognizes that the majority of international university rankings rely on the university's reputation and performance in research, without sufficient consideration of factors such as quality of teaching and learning, social diversity, and institution-specific goals (where applicable).¹⁸

The Higher Education Index takes all these into account. It was first released in 2015, reflecting both local contexts and global standards.

The index does not benchmark Arab countries against each other, nor against other countries that have already developed more advanced higher education sectors. Instead, it provides a general overview of the higher education sector in each Arab country individually, stressing their respective strengths and weaknesses.

Creating an Arab index for higher education contributes to describing the current status of higher education and it serves as a reference tool for researchers and decision makers to make more informed decisions and develop relevant corrective measures. This would enable setting realistic objectives, reflecting countries' actual needs and priorities.

Formulation process and initial structure of the index

To develop the main pillars for the Higher Education Index, a systematic review of the conceptual foundations of currently available indices in the higher education and knowledge sectors was conducted. These include the Knowledge Economy Index (KEI) issued by the World Bank, the Global Competitiveness Index (GCI)¹⁹ and the Global Innovation Index (GII)²⁰, in addition to the above-mentioned UNESCO and OECD reports.

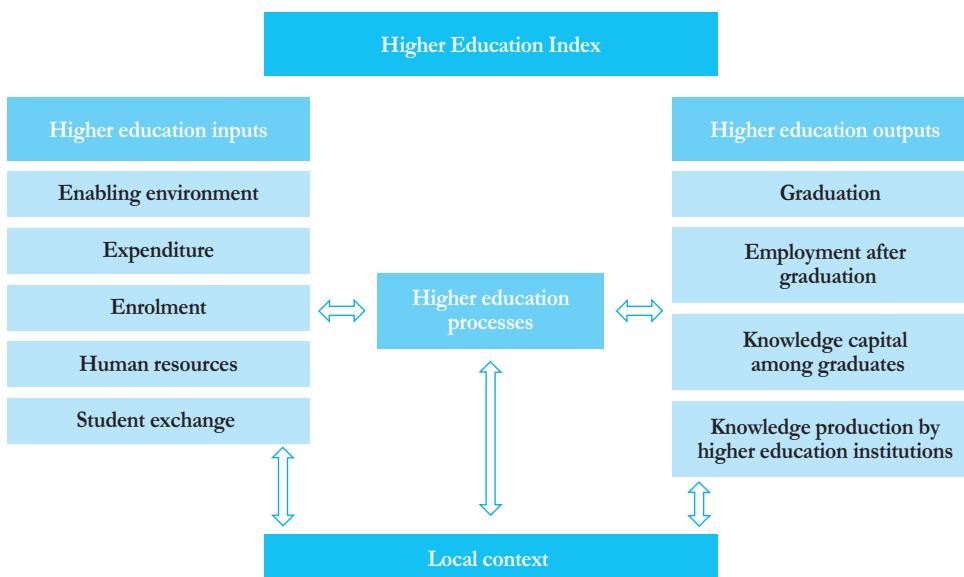
Each organization, institution or researcher may have a different perspective on building an index. For example, the GII includes tertiary education as a sub-pillar under the human capital and research pillar within the innovation sub-index; it considers knowledge through its relation to technology, which is considered an output of innovation.²¹

In a study published in 2011, UNESCO identifies three complimentary pillars of higher education indices: education, research and management capacity. The study also identifies several aspects that should be considered under these pillars, including: access, internal efficiency, relevance and external efficiency, quality of education, professionalization of higher education, capacity for research and innovation, equity, costs and expenditures, and strategic and operational management capacity.²² This division is similar to what was presented earlier in 2010, also by UNESCO, on key indicators for tertiary education, where indicators were grouped into four major categories: input indicators, access/participation indicators, output indicators and other indicators.²³

The approach adopted by the AKI Higher Education Index is to focus on knowledge as both an output of higher education institutions, and a tool for economic and human development. The index also takes into consideration systems theory, as it approaches the higher education sector by examining its inputs, processes, outputs as well as the broader enabling environment. The index considers effectiveness as the extent to which higher education institutions help graduates acquire the knowledge, skills and

Figure 11:

The structure of the 2015 Higher Education Index*



*The names have been updated to include changes resulting from the 2016 revisions.

values required to positively integrate in society and contribute to its development. Effectiveness is also measured through the number and quality of research and publications produced, and the wider processes of knowledge production, development and dissemination.

The AKI Higher Education Index also follows the recommendations of international institutions in this field by incorporating specific themes such as gender equity, private sector contribution, differences between various disciplines of study, and flow of students.²⁴

The Higher Education Index was built in line with scientific and academic index-development methodologies. After an extensive literature review, the first index was developed in 2015, comprising three pillars and nine sub-pillars, consisting of indicators based on international reports and other new indicators which the research team considered important in the specific context of the Arab region.

As shown in Figure 11, the three pillars of the Higher Education Index in 2015 were: *higher education inputs*, *processes* and *outputs*.

The *higher education inputs* pillar is comprised of five sub-pillars: *enabling environment*, *expenditure*, *enrolment*, *human resources* and *student exchange*.

The *higher education outputs* pillar is comprised of four sub-pillars: *graduation*, *employment after graduation*, *knowledge capital among graduates*, and *knowledge production by higher education institutions*. A third pillar called *higher education processes*, with no sub-pillars, enables the interaction between the inputs and outputs.

Finally, these three main pillars influence and are influenced by the specificities of the local context.

Revisions

The initial 2015 version of the index went through a revision by the core team based on the feedback after its release. These were further reviewed by a select group of education experts. Reviewers confirmed the validity of the pillars, sub-pillars, and the corresponding variables and weights, in addition to the suggested computational methods.

As detailed later in this chapter, this revision has not affected the selection of pillars and sub-pillars but has rather entailed some secondary adjustments in the constituent variables and the distribution of weights.

The revision of the Higher Education Index was conducted with three objectives:

- 1) Validating the structure of the index with its three pillars, nine sub-pillars and constituent variables.
- 2) Addressing some challenges that emerged following the launch of the Higher Education Index in 2015. These include lack of data in two sub-pillars, namely *enabling environment* and *knowledge production by higher education institutions*. The *knowledge capital among graduates* sub-pillar also lacked data, as information on only four countries was available and was extracted from the Arab Knowledge Report 2014.²⁵
- 3) Reviewing the relative weights of each pillar, sub-pillar and variable.

Rewrites applied to the main structure

No changes were made to the structure of the index, neither at the level of the three pillars (*higher education inputs*, *processes* and *outputs*) nor for the corresponding sub-pillars.

Furthermore, despite lack of data on *knowledge capital among graduates* and *knowledge production by higher education institutions* across the Arab region, these two sub-pillars were not removed for the time being, given the important weight they have within the index and also in the hope that more data will become available in the coming years.

In terms of relative weights, no changes were made to the three pillars. The *higher education inputs* pillar still maintains its weight at 0.3 of the total value of the index, the *higher education processes* pillar remains at 0.1 and the *higher education outputs* carries the highest weight (0.6) given its direct relation to development. This line of reasoning is consistent with studies and research conducted on indicators related to higher education such as the Universitas 21 rankings.²⁶

On the other hand, the relative weights of the two sub-pillars *expenditure* and *student exchange* under the *higher education inputs* pillar were revised. The *expenditure* sub-pillar's relative weight was increased from 1/6 to 1/3 to reflect the importance of expenditure in higher education, in keeping with international trends. Accordingly, the relative weight of the *student exchange* sub-pillar was reduced from 1/3 to 1/6,

in light of the limited evidence available on the nature of its impact on higher education.

The relative weights of the other sub-pillars under the *higher education inputs* pillar remained unchanged at 1/6.

As for the relative weight of the *higher education outputs* pillar, it had been previously divided among only three of the four sub-pillars in last year's AKI, as no data had been available for the sub-pillar *knowledge production by higher education institutions*. This year, however, it will be divided among all four, as the sub-pillar has been revised to include new variables with available data. Thus the relative weight of the *graduation* sub-pillar is now 1/9, 2/9 was accorded to *employment after graduation*, amounting to one third of the pillar's total relative weight; while the sub-pillars *knowledge capital among graduates* and *knowledge production by higher education institutions* were both accorded a relative weight of 1/3 each. Table A3 of the Annex shows a detailed description of the overall distribution of weights.

Rewrites applied to the variables

In the 2015 AKI Higher Education Index, the *enabling environment* sub-pillar included six variables. Data was available for two variables: *political stability and absence of violence/terrorism* and *government effectiveness*. The remaining four, namely *financial stability*, *administrative stability*, *academic freedom* and *academic integrity*, had no corresponding data. The variable *administrative stability of higher education institutions* was thus replaced by two new variables – *regulatory quality* and *rule of law* – which measure a country's overall organizational stability and commitment to law implementation. Two new variables were also added: *foundations of wellbeing* and *percentage of adults that have at least completed upper secondary education*. Both variables are important given their connection to the social and economic environments of students in higher education institutions. The *enabling environment* sub-pillar is therefore now composed of nine variables, of which data was available for six.

The *expenditure* sub-pillar originally comprised seven variables, with data available for five. One variable was added in 2016: *expenditure on tertiary*

Table 3:**Changes applied to variables in the 2015 Higher Education Index**

Variable	Modification
Higher education inputs pillar	
Regulatory quality	Added
Rule of law	Added
Foundations of wellbeing	Added
Educational attainment: at least completed upper secondary (ISCED 3 or higher), population 25+ years, both sexes (%)	Added
Expenditure on tertiary as % of government expenditure on education (%)	Added
Enrolment in tertiary education, ISCED 6 & 7 programmes, both sexes (number)	Replaced *
Gross enrolment ratio, tertiary, gender parity index (GPI)	Added
Percentage of students in tertiary education who are female (%)	Added
Extent of staff training	Added
Researchers (FTE) – higher education %	Added
Researchers FTE higher education ICSED 8 / Researchers FTE higher education	Added
% change in students studying at the undergraduate level in the US (2013/2014 and 2014/2015)	Added
% change in students studying at the graduate level in the US (2013/2014 and 2014/2015)	Added
Proportion of students studying in Arab countries from the total number of students studying abroad	Replaced *
Higher education processes pillar	
Quality of the education system	Added
Quality of math and science education	Added
Quality of scientific research institutions	Added
QS world ranking of the country's leading university	Added
School life expectancy, tertiary, both sexes (years)	Added
Internet access in schools	Added
Availability of specialized training services	Added
Higher education outputs pillar	
Proportion of graduates in ISCED 6 and 7 to the number of inhabitants	Replaced*
Labor force with tertiary education, male (% of male labor force)	Added
Unemployment of graduates of tertiary education, male (%)	Replaced*
Unemployment of graduates of tertiary education, female (%)	Replaced*
SJR ranking of the best scientific journal in the country	Added
Availability of scientists and engineers	Added
University-industry collaboration in R&D	Added
H Index	Added
Citable documents	Added
PCT patents, applications/million population	Added

* The variable has been replaced with another one. For more information, refer to Table A3 in the Annex.

education as a percentage of government expenditure on education.

The *enrolment* sub-pillar also comprised seven variables in the 2015 index, all of which had

corresponding data. Two variables were added this year – *percentage of female students in tertiary education* and *gross enrolment ratio of females in tertiary education compared to males (gender parity index)* – to reflect female access to higher education.

The *human resources* sub-pillar covered six variables, two of which had available data. The research team added three variables related to the quality of human resources in higher education institutions: *extent of staff training*, *percentage of researchers among full-time employees in the higher education sector* and *percentage of PhD holders among full-time researchers in the higher education sector*. As such, the *human resources* sub-pillar is now composed of nine variables, with data available for five.

The *student exchange* sub-pillar included three variables in 2015, with data available for two. Two variables were added to reflect the annual change of undergraduate and graduate students in the United States.

Given the difficulty of measuring processes of higher education and the quality of teaching and learning, the *higher education processes* pillar originally contained data for only one out of thirteen variables. Seven variables were added this year for a better assessment: *quality of the education system*, *quality of math and science education*, *quality of scientific research institutions*, *QS world ranking of the country's leading university*, *school life expectancy for tertiary education for both sexes*, *Internet access in schools*, and *availability of specialized training services*. Therefore, eight variables currently contain data under the *higher education processes* pillar.

The *graduation* sub-pillar this year maintains the same four variables as the previous year with no changes.

The *employment after graduation* sub-pillar previously covered six variables with data available for four. The variable *labor force with tertiary education for males as a percentage of the male labor force* was added. The two variables unemployment with tertiary education for males and females were replaced with *unemployment with tertiary education for males as a percentage of the male labor force* and *unemployment with tertiary education for females as a percentage of the female labor force*.

The *knowledge capital among graduates* sub-pillar remained unchanged in the 2016 revisions as it still includes data for ten variables in addition to one variable with missing values: *acceptance of the values of social peace, respect of difference and coexistence among students*.

As for the *knowledge production by higher education institutions* sub-pillar, no data was available for its corresponding variables in the 2015 Higher Education Index. Six variables with data were added this year: *PCT patents applications per million population*, *citable documents*, *H Index (author-level citation impact)*, *university–industry collaboration in R&D*, *availability of scientists and engineers*, and *SJR ranking of the best scientific journal in the country*. Although some of these variables are not limited to research in higher education institutions, they can still be used as alternatives in light of the limited availability of recent and reliable data.

The total relative weight of each sub-pillar was consequently equally redistributed among its updated number of variables in this year's revised version.

Table 3 lists the changes made to the 2015 Higher Education Index at the level of variables.

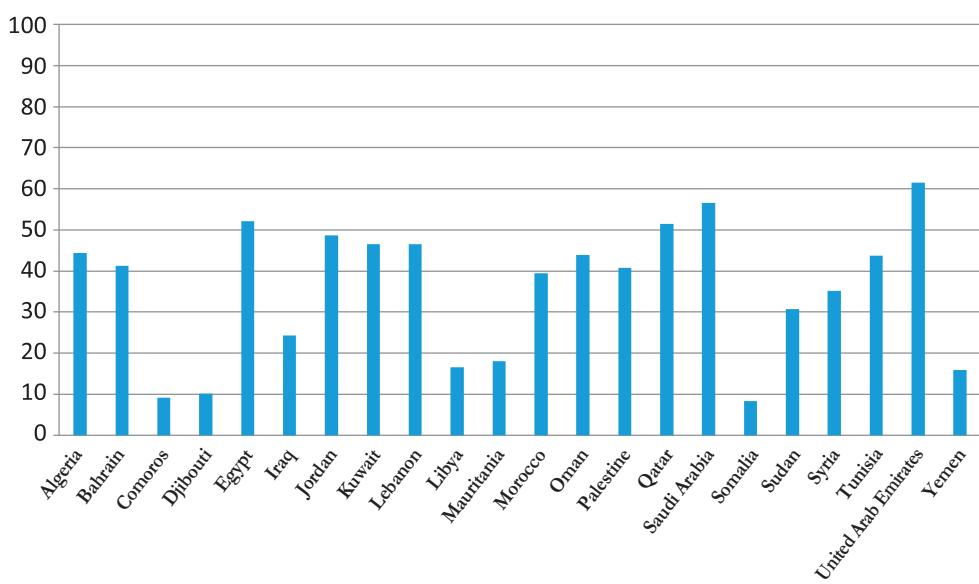
Revised Structure (2016 version)

The 2016 Higher Education Index maintains the same structure as the previous year with no changes made to its pillars and sub-pillars. Figure 11 represents the index's unchanged configuration.

Results

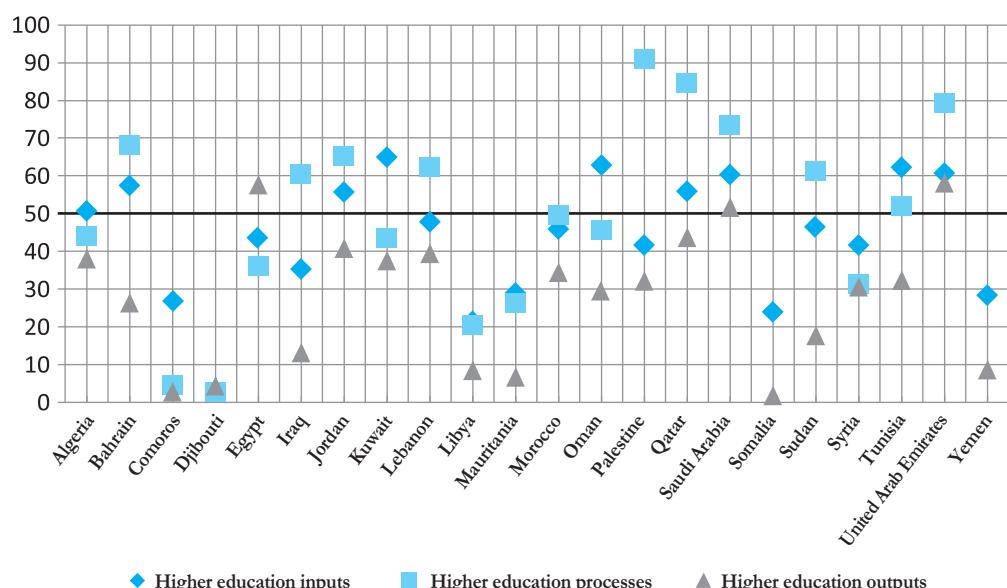
The results of the AKI Higher Education Index reveal wide disparity between Arab states, with scores varying between 8.39 (Somalia) and 61.44 (United Arab Emirates). This disparity does not necessarily reflect a lack of interest in this sector, but it rather suggests that efforts in this sector must be better coordinated and properly directed towards producing knowledge and achieving development.

None of the Arab countries scored more than 65. In fact, only one country (United Arab Emirates) exceeded 60, with three other countries scoring above 50: Saudi Arabia (56.54), Egypt (52.04) and Qatar (51.4). The low scores achieved by most Arab countries indicate two things. First, they are a true reflection of the status of higher education in Arab countries in comparison

Figure 12:**Results of Arab countries on the Higher Education Index**

to other advanced educational systems, given that the relative weight of the *higher education outputs* – including knowledge production and contribution to development – represents 60 percent of the index. Secondly, irrespective of the disparity in scores, all countries in the Arab region, including those with top rankings, need to do more to develop their educational systems in order to draw level with the average quality of systems around the world.

With regard to the results of the main pillars of the index, there is a strong correlation between them. The highest correlation was between the *inputs* and *outputs* pillars (0.721). Scores on the *processes* pillar were relatively higher. All Arab countries with general high rankings scored higher on this pillar, with second highest scores recorded under the *inputs* pillar. Countries with low rankings had their highest scores on the *inputs* pillar, followed by the *processes*

Figure 13:**Results of Arab countries on the main pillars of the Higher Education Index**

pillar. Even though they do not indicate a causal relation between inputs and outputs, these trends confirm two things: a minimum level of inputs is required for an educational system to function; the availability of human resources and processes that are capable of acting on those inputs is vital for determining the performance level of such a system, both quantitatively and qualitatively.

The results of the *inputs* pillar were consistent with those of the composite index. Higher values for the *enabling environment* sub-pillar in some countries – mostly the Gulf states – resulted in higher scores on the *inputs* pillar. Conversely, lower values for the *enabling environment* sub-pillar in countries such as Libya, Somalia, Syria, and Yemen led to lower values on the *inputs* pillar. It should be noted that data on *expenditure* was available for only 10 countries and showed a very wide disparity (85.28 in Kuwait and 2.83 in Comoros).

The constituting sub-pillars of the *processes* pillar had high values in general. Most Arab countries (with the exception of Comoros, Djibouti, Lebanon, Somalia, and Syria) have national bodies tasked with ensuring the quality of the higher education sector. This is very important but is not enough to explain the disparity in results. Some Arab countries have such bodies but achieved low scores on all variables. The values of the variables for science and mathematics teaching, quality of scientific research institutions and access to Internet at universities ranged from medium to upper medium in most countries.

In terms of the *outputs* pillar, only nine countries scored above 33, while seven countries scored less than 20. One of the reasons which could explain these low values is that data for the *knowledge capital among graduates* sub-pillar was available for only four countries, while this sub-pillar has a relative weight of 1/3 of the

outputs pillar. In addition, results of the *knowledge production by higher education institutions* sub-pillar were low despite the availability of data for its six variables in many Arab countries.

The results of the Higher Education Index highlight the important role of enabling environments in developing this sector. Second, the index gave a larger relative weight to the outputs of this sector, including students' knowledge, skills, and values as well as research, inventions, and other knowledge products to which researchers and knowledge workers in this sector contribute. The results have shown that this area requires more attention from higher education authorities, as data related to internationally registered patents, quotable scientific research papers, and university–industry partnerships were low in many Arab countries.

Finally, the index provides researchers and policymakers with a good opportunity to evaluate the higher education system and identify its strengths and weaknesses. Given the scarcity of data and analysis about the status of this sector in the Arab region, the index also aims to build a reliable database for public use. Through this information, researchers, and decision-makers should conduct their own analysis in their respective countries and design plans and programmes to improve this sector in a way that could contribute meaningfully to human development.

As such, the index focuses on the important role of this sector not from the perspective of human capital theory, which is based on providing the labour market with the required graduates; rather, it approaches the sector from a much deeper perspective that is based on providing graduates with contemporary knowledge, skills, and values so that they contribute to the development of their communities.

Endnotes

- ¹ The World Bank defines higher (tertiary) education as “all post-secondary education, including but not limited to universities. In recent years a diverse and growing set of public and private tertiary institutions in every country – colleges, technical training institutes, community colleges, nursing schools, research laboratories, centres of excellence, distance learning centres, and many more – form a network of institutions that prepare students for application of knowledge at an advanced level.” (World Bank, 2015). 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, Level 7 for the Master’s degree, and Level 8 for the Doctoral degree, according to UNESCO’s International Standard Classification of Education (ISCED).
- ² World Economic Forum, 2015.
- ³ Wildavsky, 2010.
- ⁴ Lane and Johnstone, 2012.
- ⁵ Shaffer and Wright, 2010.
- ⁶ Thomson, 2008.
- ⁷ Ibid.
- ⁸ UNESCO, 2014a.
- ⁹ See: <http://www.anqhac.org/?lang=en>
- ¹⁰ See: <http://www.aneca.es>
- ¹¹ See: <http://www.universitas21.com>
- ¹² Liu, 2009.
- ¹³ See: <http://www.voluntarysystem.org>
- ¹⁴ UNESCO, 2013.
- ¹⁵ Ibid.
- ¹⁶ El-Hefnawy et al., 2014.
- ¹⁷ UNESCO, 2014a.
- ¹⁸ OECD, 2010.
- ¹⁹ World Economic Forum, 2013.
- ²⁰ Cornell University et al., 2014.
- ²¹ Ibid.
- ²² Martin and Sauvageot, 2011.
- ²³ Labe, 2010.
- ²⁴ UNESCO Institute for Statistics, 2014b.
- ²⁵ UNDP and MBRF, 2014.
- ²⁶ Universitas 21, 2015.

