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# Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance


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*Chief Editor*
Adnan Badran
Department of Nutrition
University of Petra
Amman, Jordan

*Editors*
Elias Baydoun
Department of Biology
American University of Beirut
Beirut, Lebanon

John R. Hillman
James Hutton Institute
Dundee, UK

ISBN 978-3-030-03773-4 ISBN 978-3-030-03774-1 (eBook)
https://doi.org/10.1007/978-3-030-03774-1

Library of Congress Control Number: 2019931021



This Springer imprint is published by the registered company Springer Nature Switzerland AG.
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

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# Introduction


**Adnan Badran, Elias Baydoun, and John R. Hillman**

**Abstract** In a series of 18 chapters, this book reviews the roles of independent assessments of teaching, research, administration, planning, and governance in universities in general and Arab universities specifically. It also considers the relevance of academic teaching, research, and societal impacts. The outcomes of actual quality-assurance assessments are described, and proposals made for future developments.

**Keywords** Arab universities · Quality assurance · Relevance · Teaching · Research · External audits

Following publication in June 2018 by Springer of our previous book entitled *"Universities in Arab Countries: An Urgent Need for Change*" (ISBN 978-3-319-73110-0), we now address the closely related issues of quality assurance (QA) and relevance in universities, drawing on the expertise of 26 international experts. In an era of unprecedented social and technological changes, institutions of higher education throughout the world need to adapt to market requirements for their graduates and postgraduates as well as meet quality standards imposed by governments and demanded by students and by their parents and sponsors. Arab universities face particular challenges reflected in numerous reports from authoritative organisations such as the United Nations in its Arab Human Development Reports, the World Bank, and World Economic Forum, as well as detailed analyses by individual academics and economists.

A. Badran (✉)
Department of Nutrition, University of Petra, Amman, Jordan
e-mail: abadran@uop.edu.jo

E. Baydoun
Department of Biology, American University of Beirut, Beirut, Lebanon
e-mail: eliasbay@aub.edu.lb

J. R. Hillman
James Hutton Institute, Dundee, UK
e-mail: John.Hillman@hutton.ac.uk



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_1

Little has changed in the challenges facing the Arab world since we wrote the Introduction to the previous book. Socio-political development continues to lag behind that of developing countries in Asia that were once at the same stage of development. There has been a continuing failure to industrialise, export value-added goods, generate and exploit valuable intellectual property, create successful businesses, and fully integrate into the globalized economy. The 22 Arab countries have a combined population of around 407 million and most are classified as under-developed. There is widespread poverty exacerbated by political instability and high levels of unemployment and underemployment, even of graduates, coinciding with dramatic increases in the number of graduates and institutions of higher learning. Inadequate access to fresh water, food shortages, and lack of energy security also afflict significant sectors of Arab populations, a situation forecast to worsen with the impacts of global climate change. This aspect was the focus of our previous book in 2017 also published by Springer, namely "*Water, Energy & Food Sustainability in the Middle East. The Sustainability Triangle*" (ISBN 978-3-319-48919-3). Compounding the economic and environmental difficulties faced by Arab countries are relatively high birth rates, civil unrest, war, attempted cultural genocide, population displacement, and minorities placed under pressure. On first analysis, the future does not bode well for the young while Arab countries have authoritarian governments, weak civil-society institutions, wide disparities in wealth, and substandard public finances. It is our view that rectifying the Arab problems can only come from a wholesale improvement in the quality and relevance of education in general, and higher education specifically to provide graduates and postgraduates to drive the necessary advances in economic and social development. Universities will shape the future. They are already beginning to act as the motive force for wealth creation and enhancing the quality of life. Nonetheless, most need to adapt to new ways of learning and utilizing new technologies. Current levels of graduate unemployment and underemployment are an indictment of irrelevant and low-grade higher education.

By focusing on both (a) independent assessments of the quality of teaching, research, administration, planning, and governance; and (b) the relevance of teaching, research, and societal impacts, this book is designed to provide, for the first time, accounts of actual QA assessments in the Arab region and their impacts, ways of judging academic relevance, and proposals for future developments. Regional perspectives including QA audits in times of conflict demonstrate the resilience of Arab higher education. The book is a unique compendium of information on assessments of quality and relevance in universities, with great significance on how universities address change in the era of rapidly advancing technologies and new models of higher education.

Over the last two decades, formal quality-assurance (QA) assessments in higher education have gained significant momentum by the establishment and operation of several international and national official QA organisations. Their methodology and processes are undergoing greater sophistication as they attempt to address multiple issues including higher standards of education and training to produce graduates and postgraduates to drive national economies, greater institutional efficiency and

cost-effectiveness, better use of public resources, greater accountability to stakeholders, and cross-border recognition of qualifications. Action on standards and relevance are desperately needed at a time when there is unprecedented growth in participation in various forms of higher education, with growth particularly taking place in online, distance, and flexible learning. This growth coincides with much greater internationalization than hitherto as well as increasing levels of student, graduate, and postgraduate mobility, and greater reliance on online and blended learning and training. Universities need to adapt innovatively to this new educational environment and fully exploit the potential of online learning and lifelong learning for the benefit of national and regional economies. Governments have special responsibilities to develop policies that give rise to dynamic high-quality higher-education sectors and promote innovation and entrepreneurship. Special attention needs to be given to generating and utilizing new technologies and encouraging cross-disciplinary scholarship.

There are signs that higher education in the Arab world is on an upward trajectory. Many universities have embraced independent QA assessments. The very survival of some universities is dependent on substantial improvements in their quality and relevance, and to justify the possessing the title of university. In the UNESCO regional overview of the Arab States and its 'Science Report: Towards 2030', it was noted that despite ongoing political instability in much of the region, progress was made in many measures of inputs into and outputs from science, technology, and industry (https://en.unesco.org/unesco_science_report/arab-states). There was a doubling of publishing and R&D intensity. Collectively, the Arab states accounted for about 1% of global R&D expenditure in 2013. Science and research are two areas where Arab countries are closer to gender parity than other countries, e.g. Europe.

Whereas this book concentrates on QA and relevance of higher education in the Arab world, it nevertheless has a distinctive international perspective. Following this Introduction, chapter "Quality Assurance and Relevance in Academia: A Review" (*Hillman & Baydoun*) describes the background, concepts, principles, and aims underpinning quality assessments and audits, and considers various forms of assessment and the value of independent external assessments by international QA agencies. Most of these assessments are still being developed and do not yet cover all aspects of academic life. Search engines and artificial intelligence are beginning to be explored for inter- and intra-institutional analyses. Fundamentally, QA assessments aspire to inculcate a culture of quality in all academic activities and encourage self-improvement. Internationally recognised QA underpins transnational recognition of academic qualifications. The diversity of higher-education institutions in the Arab world, types of accountability to governments, and the state of the economy in the host nation mean that audits and their recommendations need to be customised. Other forms of assessing the worth or standing of an organisation include listing in international and national ranking tables, visiting-group (visiting-team) exercises, application of bibliometrics and citation metrics, and peer evaluation. Strategies to improve the quality and impact of higher-education organisations include carrying out SWOT (strengths, weakness, opportunities, threats) analyses,

in addition to horizon scanning, trend impact analyses, scenario methodology, Delphi, and Foresight exercises. Assessing relevance is more complex and there is no agreed framework, but studying the societal impacts of graduates and postgraduates as well as the research and development outputs of an organisation can offer a tangible form of assessment. Also, a close link exists between relevance and responsible science, and its equivalent in other academic disciplines. The issue of corruption in its various forms is considered in the context of carrying out QA and relevance assessments. The implications of the twenty-first century Skills Framework must be taken into account. Universities should provide an encouraging environment for creativity, innovation, and entrepreneurship. Permission given by governments to organisations to establish and operate universities should be partly dependent on those universities functioning to high-quality standards and be shown to do so by periodic independent QA and relevance assessments. Governments also have responsibilities to provide a buoyant operating environment for universities several changes to Arab government policies are recommended. International coordination is needed urgently to stop the issuance of fake degrees and professional diplomas. Summary tables are included of (a) the key points to be addressed in comprehensive QA and relevance assessments of universities in the Arab region, and (b) examples of rapidly developing, relevant technologies affecting all academic disciplines as well as graduate and postgraduate employability.

The next chapter "Transnational Educational Networks of Excellence Based on Quality, Accreditation, and Recognition Management: A Holistic Approach" (*Schumann, Xiao, Reuther, & Tittmann*) draws on European expertise. Firstly, the context of the Triple Helix Model – the co-operational procedures between university, industry, and government is discussed in the light of the development of knowledge-based relationship networks and the roles of ISO 9001 and ISO 29990 in addressing standards. To achieve regional, national, and international goals, coalitions of educational institutions supported by businesses and governments require high-quality standards and are implementing QA processes according to ISO 9001 standards. Evaluation and QA for education and training systems and study programs have benefited from the Bologna process while some institutions are using their autonomy to fast-track international activities and international quality networks. Trust and mutual understanding of the processes involved are paramount in achieving mutual recognition of academic achievements and for effective bilateral and multilateral cooperation. New developments in education will arise from digitization, digital ecosystems, and disruptive innovation models and these will have to be factored into QA and improvements in heterogeneous education networks and systems.

Chapter "Is There More to Quality Assurance Than Quality?" (*Lindqvist*) notes that the European Standards and Guidelines of Quality Assurance applied in the European higher-education area are being used by countries outside Europe. Quality in higher education is a multidimensional concept usually interpreted as being fit for purpose and based on an institution's ability to fulfil its stated mission or strategy. This raises questions about the feasibility and quality of the mission or strategy. The processes involved in QA require wholesale involvement of the entire academic

community, with equitable treatment of all and functioning in a transparent way so that it is communicated to the institution's stakeholders. Trust is paramount to conduct proper self-evaluations. Independent and impartial peer reviews have the sole aim of achieving good quality and their assessments should be placed in the public domain. With time, QA processes should lead to a culture of quality within the institution. With regard to the Arab states, the next stage could be the formation of a proper Arab Higher-Education Area.

In chapter "The Importance of Safeguarding Functional Independence in External Quality Assurance Decision-Making Systems" (*Bobby*), the meaning of functional independence and its importance in making accreditation decisions and conducting other external QA reviews is explored in detail. External QA organizations must be able to demonstrate functional independence from political or governmental influences and professional organizations. This requires a careful structuring of their review and decision-making processes, and includes written policy statements safeguarding their independence of their (a) standards-setting activities, (b) decision-making activities, (c) review processes conducted by staff and on-site reviewers, and (d) the policies and procedural practices established by members of the decision-making body. Chapter "The Evolving Landscape of Global Higher Education: Challenges and Opportunities from a Graduate Education Perspective" (*DePauw*) addresses the fact that change is the watchword of the twenty-first century and universities must change to meet social demands and expectations, and to serve their public and stakeholders responsibly. In so doing, they will experience both challenges and unprecedented opportunities. This means they must have a forward-thinking approach, be adaptive and agile, foster interdisciplinarity and integrative research and education, and become transformative. Graduate education is a critical component of the twenty-first century university and transforming the system of graduate education can facilitate the necessary changes. An example of this is the Transformative Graduate Education Initiative of Virginia Tech Graduate School.

The following thirteen chapters concentrate specifically on the Arab world. Chapter "Reform of Higher Education in the Arab World" (*Waterbury*) argues that change in the Arab world is occurring because it is largely crisis-driven. The best-known instances of painful reforms in the Arab world came in response to the structural economic crises of the 1970s and 1980s. Leaders at that time, and today, were willing to implement reforms that shattered social contracts because the alternative – business as usual – appeared to be even worse. Because reform of higher education is inherently politically dangerous with ramifications well beyond the educational sphere, the chapter examines how policy reform might come about. The impetus for educational reform is derived from the on-going economic crises. In particular, reforms will try to respond to the dangerously high levels of unemployment, above all youth unemployment, that characterize the entire Arab world. The inability of Arab youth to find suitable employment is the result of an educational system characterized by outmoded pedagogy, insufficient public funding, and inappropriate training for the twenty-first century work place. It is argued here that leaders in the Arab world realize, above all after the uprisings of 2011, that this situation

can be regime-threatening. The challenges to reform are considered under the following rubrics: governance and finance; education for the job market; quality assurance; incompletion rates; research/R&D; regional cooperation; and information technology.

The theme of profound change in Arab universities is further advanced in Chapter "Digital Transformation and Quality, Efficiency, and Flexibility in Arab Universities" (*Sebaaly*). Disruptive technologies such as artificial intelligence, Big Data, cloud computing, social media, virtual and augmented reality, and mobile technologies are reshaping higher education. Technology-enhanced learning programs are leading to flexible, blended, online, and accelerated programs. The business models of the university sector are being revised. New digitally based technological developments are fueling innovative university applications. This helps in responding to the pressure of student expectations for enhanced learning and better user experience when accessing university services. It also helps in improving the university's competitive advantage in an internationalized market, and has direct results on enhancing the learning experience and quality of service; more efficient student recruitment and retention, more efficient operations and reduced costs, greater classroom innovation, new modes of research, and easier access to both administrative tools and academic coursework from any device. A single application accessible from any device can now manage the student's entire life on campus. More digital services result in more data collected on every aspect of university life, and thus in more effective data analytics and intelligent forecasting and planning. This extension of reach, effectiveness, and quality cannot happen without a proper change-management strategy resulting in embracing new digital skills and an overall cultural change.

Chapter "Indicators of Institutional and Program Ranking of Universities with Reference to the Arab World" (*Badran & Badran*) notes that for a population of around 400 million, there are 700 public and private universities in the Arab world with an enrollment of 13 million students and 250,000 academic staff. The 300 private universities accommodate 30% of the student population compared with 50% in Japan, 30% in Europe, and 20% in the US. Ranking is controversial and biased in favor of research in the natural and medical sciences with less emphasis on engineering and social sciences, largely ignores the humanities, and favours publications in English. Academic rankings of world universities vary in the criteria used for excellence. Thus, Shanghai Tiao Tong university ranking "Academic Ranking of World Universities" (ARWU), established in 2003, was based on two indicators, namely published papers in top journals and staff winning high awards. ARWU ranks 500 top world universities. Institutions are ranked in 52 subjects across natural sciences, engineering, life sciences, medical sciences and social sciences and uses four criteria: quality of education, quality of faculty, research output, and per capita academic performance. The Times Higher Education World University Ranking (THE) along with ARWU and QS world universities rankings are the three most influential international university rankings. THE uses 13 indicators grouped under five categories: teaching, research, citation-research impact, international collaboration, and innovation. The QS ranking uses six indicators: academic reputation,

employer reputation, faculty-student ratio, citations per faculty, proportion of international students, and proportion of international faculty. Jordan Ranking for universities was developed recently and is based on giving universities an overall ranking score in respect to five major performance indicators: teaching and learning, scientific research, internationalization, quality of graduates, and academic accreditation. The introduction of university rankings has created competition for global standing, quality graduates, and research outputs.

Chapter "Quality Assurance in the Arab Region in the Era of Customization: Where Do We Stand in Terms of Relevance?" (*Karakhanyan*) records that the major paradigm shift from standardization to the customization era has posed a whole range of challenges in terms of relevance of higher-education provisions in general and that of QA, in particular. QA is moving from its initial purpose of ensuring credibility and trust to also ensuring relevance of higher-education provisions and, most recently, the issues of recognition of outcomes and outputs. In addition to the diversity of needs resulting from globalization and the ICT revolution, the needs of a specific system should be considered at several levels, including but not limited to subject-specific, institutional, system-wide, national and regional levels. To ensure the HE systems are relevant and cover the diversity of provisions in the increasingly customized environment, multiple and diverse measurement tools need to link and lead to the solution of a range of system needs. The chapter takes stock of the last decades of developments in higher education and QA provisions in the Arab region through a critical reflection on the relevance of those provisions to the diverse socio-economic needs of the system. It also critically analyzes the existing QA systems in the Arab region in terms of international comparability and national suitability as well as sets a stage for further deliberation on the effectiveness and efficiency. Overall, the higher-education system in the region is characterized as booming in terms of diversification, including transnational provisions as the major trend. On the other hand, the QA system seems to be successfully completing its establishment phase and currently being in a transition to revise and introduce a more customized system to coherently link QA mechanisms with the set priorities at a diversity of levels. One of the major findings in terms of relevance is the further need to link the national qualifications frameworks in the region with respective QA tools to promote relevance and ultimate recognition of the qualifications offered nationally, regionally, and internationally. To promote relevance and recognition, a need to move from input- and process-based mechanisms to more outcome-based approaches by establishing links to the diversity of needs seems to be tangible. The chapter culminates in a set of recommendations aimed to promote relevance of higher education to the needs of the customization era.

In chapter "UNESCO Conventions on the Recognition of Higher-Education Qualifications" (*Bouhlal & Wells*) concerns one of the many key roles played by the United Nations Educational, Scientific and Cultural Organization (UNESCO) reflecting its responsibility for coordinating international cooperation in education, science, culture, and communication in its 195 member states. It is the only UN agency with a mandate in higher education and contributes to developing evidence-based higher-education policies, notably Target 4.3 of the United Nations Sustainable

Development Goal 4 ("*by 2030 ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university*"). To address the challenges faced by those seeking to pursue higher education or highly skilled work in in a different country from which they obtained their higher-education qualifications, the member states of UNESCO's Arab region recently agreed to revise the Convention for the Region in preparation for an eventual Global Recognition Convention. These Conventions incorporate significant new principles including the granting of recognition unless substantive differences are identified, placing the burden of proof on the recognition authority, establishing a national information center or similar body, and providing special provision for recognizing the qualifications of refugees. The revision of the Arab Convention on the Recognition of Higher Education Qualifications, Diplomas and Certificates is discussed in relation to QA systems in the region.

Chapter "The Diploma Supplement as a Tool for Quality Assurance and Relevance" (*Zabalawi & Floden*) relates closely to the previous chapter and describes the important development and implementation of the Diploma Supplement across the Middle East. The typical condensed academic transcript or certificate is no longer adequate for students transferring internationally for further study or for graduates seeking employment or career progression beyond borders. To meet this gap, a comprehensive Diploma Supplement emerged from international meetings and agreements since the 1980s, in particular the Bologna process, the Lisbon Recognition Convention, the World Declaration on Higher Education for the twenty-first Century, and the Sorbonne Declaration. Many countries and individual institutions of higher education have now introduced Diploma Supplements, or similar, that provide details such as the level of qualification, mode of study, learning outcomes, knowledge, skills and objectives of the course, and grading information and grade distribution. The existence of these comprehensive documents enables institutions of learning elsewhere to gain a clearer background to previous studies and thereby expedite decisions regarding equivalency. For prospective employers in other countries, the documentation provides a clearer picture of the learning undertaken by the graduate. Updates within the MENA region of such expanded graduation documents have been slow. This chapter provides an historical perspective of the evolutionary processes involved in Diploma Supplements as an important communication tool and considers issues associated with their introduction across the Middle East.

The remaining chapters make reference to specific Arab countries and their experience with QA and relevance assessments. Chapter "Quality Assurance and Relevance for Competitive Higher Education: Context of Jordan" (*Badran & Muwalla*) notes that the number of Arab universities has increased to reflect the increase in the youth population but without a concomitant increase in quality. The proportion of the 20–29-age cohort is over twice that of that in OECD countries, and high-quality education is essential for developing the nascent knowledge economy and improving the quality of life. Drawing on the impacts of QA in Europe, the Arab region delivered 14 national commissions for QA in higher education and established four regional networks. Some universities have established partnerships with universities abroad. At the regional level, the Association of Arab Universities have established norms and standards

for QA and accreditation. The Arab Network of Quality Assurance in Higher Education was launched in 2007 in association with international networks. UNESCO and the World Bank launched the Global Initiative for QA Capacity-building, and UNDP has funded regional initiatives, too. The weakness of Arab education lies in the quality of curriculum, namely outdated content lacking in relevance to labor-market needs. Also lacking is a culture of lifelong learning and community engagement. Graduates are weak in language skills, mathematics, and critical thinking. QA in Arab universities tends to be oriented to quality control as opposed to quality assurance. Private universities are hamstrung by outdated centralizing regulations enforced by the Ministry of Higher Education. Teaching tends towards rote learning rather than promoting independent learning. Tangible achievements of QA assessments have yet to be realized in most universities. Proactive mechanisms are needed to facilitate academic development using modern technologies, benchmarking, staff training, and peer reviews. Jordanian universities have carried out QA and accreditation exercises in a range of subjects. The Higher Education Commission set indicators for institutional QA and issued guides for every academic programme.

Chapter "On the Quality Assurance of Faculty Members" (*Bettaz & Kamal*) discusses and proposes measures and actions aimed at involving faculty members in certain QA processes and related activities. This allows them to acquire the QA culture and competencies they need by carrying them out instead of resorting to one-off passive induction training sessions, as occurs in some higher-education institutions. The measures and actions are supported by some best-practice examples, learned from participation in national and international QA projects and programs, including QA of programs in Jordanian universities, blended learning at Philadelphia University, and QA of e-learning courses in Avicenna Virtual Campus. A series of elements are proposed that allow higher-education institutions to (a) enforce the notion of a QA culture in all stakeholders in general, and teachers in particular; and (b) ensure the competences of their teaching staff to deliver diversified and more student-centered learning and teaching.

Bibliometrics is rapidly gaining popularity and importance in research evaluation. It is becoming an essential tool to assess and stimulate research productivity, guide decisions in research funding, and benchmark with peer institutions. In chapter "Role and Impact of Bibliometric Analysis of Research Productivity in Faculty Evaluation, Recruitment, Promotion, Reappointment, Benchmarking, and in Mission-Based Management (MBM): Experience of the Faculty of Medicine at the American University of Beirut (AUB), 1997–2007" (*Cortas & Rahal*) bibliometric analysis of research performance was deployed in the Faculty of Medicine (FM) at the American University of Beirut (AUB). Data were obtained from curriculum vitae and the databases of Scopus and ISI Web of Science. Performance of the FM was compared to similar data obtained from 1997 to 2007 for 123 medical schools registered at the American Association of Medical Colleges (AAMC). The indicators applied included number of papers, total number of citations, average citations per paper, percentile journal ranking per discipline, impact factor (IF), Adjusted IF, impact index, and funding. Collaboration patterns within and among the departments at the FM were also analyzed. The targets established for FM could be partially

attributed to increasing, as per Scopus, the number of articles by 4.7-fold, the number of articles per faculty per year by 4.0-fold, and extramural funding by 3.7-fold, in 10 years. This improved the quality of research productivity at promotion without decreasing the promotion success rate, and increased the number of faculty members eligible for tenure or long-term contract. The average amount of research funding required at FM per investigator to achieve the set target was determined. Applying a basket of bibliometric indicators provided an overview of the research productivity of the investigator, department, and medical school. Bibliometrics complement rather than replace peer assessment; they guide decision-making and facilitate benchmarking.

QA and relevance assessments in the Maghreb are the themes of the following two chapters. Chapter "Quality-Assurance Agencies in the Maghreb Countries: Challenges and Opportunities" (*Benjelloun*) notes that the recent creation of QA agencies for higher education in specifically in Morocco, Algeria, and Tunisia is intended to improve the quality of university governance and programs and to align their QA policies with those in neighboring European universities. QA hitherto was limited to individual university initiatives, frequently undertaken in cooperation with external partners. Faced with massification of the demand for higher education, North African countries have moved hesitantly towards diversifying their higher-education sector. Private and semi-private universities were encouraged as well as public-private formulas that have thus far not really managed to alleviate the situation by serving a significant proportion of students. In order to ensure quality standards in public higher education and to regulate the new non-public initiatives, the new QA agencies need to develop an environment favoring transparent evaluation in accordance with well-developed sets of regulations. Yet the initial mandates of these agencies place them squarely under government surveillance, in contrast with regulations in effect for similar agencies in other regions of the world. The opportunities and challenges facing these agencies are considered. Chapter "Introducing Quality Assurance in Algerian Higher Education: The Case of the University of Science and Technology Houari Boumediene" (*Guessoum*) describes the need for QA specifically in Algerian universities and the efforts made by the Algerian Ministry of Higher Education on setting the ground for the introduction of QA and making it mandatory on all higher-education institutions in Algeria. The main sections of the national QA framework comprises teaching; research; governance; infrastructures; life on campus; relations with the socio-economic environment; and international cooperation. As a timely case study, the operation is detailed of the institutional Self Evaluation task force during the Spring Semester of 2017 at the University of Science and Technology Houari Boumediene, probably the most important science and technology university in Algeria with eight sizeable colleges and more than 41,000 students. The challenge of organising Self Evaluation for a university of this size and the hurdles met, as well as encouraging promises are considered along with the key findings from the Self Evaluation Report as well as some examples lessons learned from the evaluation.

In the final two chapters, attention switches to Syria, a country in conflict and under great stress. Even so, QA has not been disregarded. Chapter "Higher Education

Relevance in Post-War Syria" (*Mourtada*) is an overview that discusses the evolution of relevance in higher education in pre-war Syria and possible developments in the post-war years, emphasizing governmental policies, social needs, and connections between universities. The success of the post-war reconstruction process is dependent on a quality-assured higher-education sector able to produce skilled graduates, relevant research, and business ventures. Concluding the book is chapter "Unified National Medical Assessment: An Approach towards Meeting the Needs of the Population during the Syrian Crisis" (*Dashash*), an important illustration of the resilience of the higher-education sector to maintain high standards despite exceptionally challenging circumstances. The carefully designed Unified National Medical Exam (UNME) has made the maintenance of high standards of medical education in Syria possible, and the chapter details the implementation of UNME, its methodologies, challenges, and achievements.

Preparations are in hand to publish another book on the future of Arab universities, this time concentrating specifically on both innovation and entrepreneurship. These two topics are central to economic and social development in the Arab region but most Arab universities, and probably most universities worldwide, underperform in generating innovations and businesses. In addition to the changes essential to improve QA and relevance, further reforms to Arab universities will be necessary to guarantee that they contribute fully to wealth creation and the quality of life of their host countries and the region. In so doing, they will realise the undoubted potential of their graduates and postgraduates.

Finally, we acknowledge with gratitude financial assistance from the University of Petra, Jordan. We thank Margaret Deignan of Springer for her guidance, help, and continuing support, and Joelle Mesmer for assistance with processing the manuscripts.

# Quality Assurance and Relevance in Academia: A Review


**John R. Hillman and Elias Baydoun**

**Abstract** Concepts of quality in higher education and the nature of the processes needed to raise standards may be debatable, but mainly for economic reasons most countries are either overtly driving or subtly encouraging their institutions to conduct one of a variety of quality-assurance (QA) assessments, preferably using independent agencies. These assessments are still being developed and do not yet cover all aspects of academic life. Search engines and artificial intelligence are beginning to be explored for inter- and intra-institutional analyses. Fundamentally, QA assessments aspire to inculcate a culture of quality in all academic activities and encourage self-improvement. Internationally recognised QA underpins transnational recognition of academic qualifications. Other forms of assessing the worth or standing of an organisation include listing in international and national ranking tables, visiting-group (visiting-team) exercises, application of bibliometrics and citation metrics, and peer evaluation. Strategies to improve the quality and impact of higher-education organisations include carrying out SWOT (strengths, weakness, opportunities, threats) analyses, in addition to horizon scanning, trend impact analyses, scenario methodology, Delphi, and Foresight exercises. Assessing relevance is more complex and there is no agreed framework, but studying the societal impacts of graduates and postgraduates as well as the research and development outputs of an organisation can offer a tangible form of assessment. Also, a close link exists between relevance and responsible science, and its equivalent in other academic disciplines. Corruption in its various forms is described and must be addressed. Universities should provide an encouraging environment for creativity, innovation, and entrepreneurship. Permission given by governments to organisations to establish and operate universities should be partly dependent on those universities functioning

J. R. Hillman
James Hutton Institute, Dundee, UK
e-mail: John.Hillman@hutton.ac.uk

E. Baydoun (✉)
Department of Biology, American University of Beirut, Beirut, Lebanon
e-mail: eliasbay@aub.edu.lb



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_2

to high-quality standards and be shown to do so by periodic independent QA and relevance assessments. Governments also have responsibilities to provide a buoyant operating environment for universities and we recommend several changes to Arab government policies. International coordination is needed urgently to stop the issuance of fake degrees and professional diplomas. Summary tables are included of (a) the key points to be addressed in comprehensive QA and relevance assessments of universities in the Arab region and elsewhere, and (b) examples of rapidly developing, relevant technologies affecting all academic disciplines as well as student employability and institutional relevance.

**Keywords** Quality assurance · Relevance · University rankings · Bibliometrics and citation metrics · Peer reviews · SWOT analyses · Horizon scanning · Trend impact analyses · Scenario methodology · Foresight analyses · Delphi analyses · Corruption · Creativity · Innovation · Entrepreneurship · Technologies · STEMM subjects

## 1 Introduction

Humans undoubtedly have always possessed powers of discrimination (sensu stricto) to distinguish between safe and unsafe, healthy from unhealthy, good versus bad, and consequently have the ability to set standards, and thus quality [1]. In essence, quality can be considered as the standard of an item or service compared with others of a similar kind, giving rise to the concept of quality being a distinctive characteristic, attribute, or feature possessed by consumables, objects, individuals, or institutions. Quality has come to be regarded, therefore, as the degree of excellence or merit of a product, service, a person, or institution. It can be measured, controlled to some extent, and described, such as: bad, awful, poor, barely acceptable, adequate, good, high, top, outstanding etc. [2]. Contrasting with some components of the modern popular entertainment industry, we do not know of any country that has become richer by dropping standards.

The history of civilisations demonstrates unequivocally that high-quality items and services have always been appreciated, even as fashions and preferences change throughout the ages. In earlier times, the medieval guilds in Europe [3] set standards for the competencies of craftsmen, and some of these persist in the livery companies and guilds in present-day London [4] and in several UK-wide apprenticeship schemes. In France, the somewhat idiosyncratic Compagnons du Devoir et du Tour de France, established in medieval times, offer apprenticeship schemes in the trades – jobs that require manual skills and specialist training – to young people; these schemes often involve touring France for several years to acquire new techniques and hone their skills [5]. In Germany, a dual vocational training system operates for learning a trade whereby students attend a vocational school gaining relevant theoretical knowledge and receive on-the-job training at a company. There are around 350 officially recognised training programmes in Germany that are highly regarded internationally [6]. Many countries have further education and higher edu-

cation training schemes linked with industry, and the distinctions between apprenticeships and graduates are becoming blurred. Religious institutions try to maintain rigorous standards of knowledge about their creeds and the behaviour of their adherents. In the modern era, as the impacts of the Enlightenment and Industrial Revolution took hold around the world, formal assessments of quality assurance and quality control with its associated auditing processes gained traction in many societies, firstly with manufacturing industry and financial management, and then with a wide range of service industries, including education. Societies of all kinds continue to award prizes and medals for meritorious work. Periods of warfare, in particular World War II, had a strong influence in enforcing high-quality manufacturing. We have now progressed to the implementation of Total Quality Management (TQM) systems adopted mainly in the private sector by manufacturing and service industries [7] and Continuous Improvement process (CI). Quality assurance (QA) is commonly accepted as a systematic process of checking whether a process, service, or product meets specifications and expectations, so that non-conformity, defects, deficiencies, and failures can be addressed and corrected [8]. Statistical quality control, including the development and application of software and other forms of QA are routine in much of the private sector but have yet to become mainstream in the public sector [9]. QA software products are used for deployment, audit management, compliance management, corrective and preventive action (CAPA), defect tracking, document management, quality control by and of suppliers, training management, etc. [10]. In the absence of reliable performance and quality data, undue reliance is placed on reputation, an easily manipulated factor in this present era of social media, and a problem that afflicts international medical and legal tourism.

One common meaning of the noun and transitive verb "audit" and its gerund or present participle "auditing" refers to the conduct of an official and independent inspection of a company or organisation, examining accounts, statutory records, documents, and vouchers to ascertain if the financial statements and non-financial disclosures provide a true and balanced view. Yet any operation or function can be audited, such as energy usage, and inform the organisation or third parties as to the honesty, integrity, accuracy, security, and quality of management. An "audit trail" is a systematic analysis that traces all transactions on a subject or process, extending beyond matters financial into databases, law, and legal and moral obligations of disclosure. Audits are systems that lend themselves well to information technology. Crucially, the QA system is in effect an elaboration of the auditing process. Much can be learned from the current position of the four major international financial auditing firms (Deloitte, EY, KPMG, and PWC) that audit the accounts of the world's largest companies, often supplementing their earnings with lucrative consultancy and taxation-advice (especially tax-avoidance schemes) services to those companies in addition to providing consultancy services to governments. In the wake of several collapses of companies with substantial numbers of employees despite apparently favourable audit opinions, investors and governments are now challenging the quality and roles of audits, valid issues of conflicts of interest, inadequate competition leading to the formation of a cartel, and the roles of regulations and regulators [11]. Auditors have responsibilities not only to shareholders but also to creditors, pensioners, taxation authorities, law of the land, regulators, and the

bodies that oversee their professional standards. Nevertheless, such audits as presently conducted clearly do not and can not offer guarantees; they can only give an opinion as to (a) whether the accounts are a true and fair representation, (b) the risk of fraud, and (c) whether the company or organisation is a "going concern". Unless an audit is classified as a forensic audit that is now becoming easier with the development of specific software able to detect anomalous transactions and linkages to suspect individuals and organisations, only a sample of transactions can be analysed. Thus audits are essentially subjective and based on a series of assumptions and judgements by those conducting the audit. Perhaps from the experiences of the International Forum of Independent Audit Regulators, there should be audits of audits to detect flaws and propose improvements to systems. Prospects of litigation and potential reputational damage to both the auditors and the audited mean that misconceptions about audits should be removed at the outset, and their limitations explained. A similar situation prevails with the credit rating agencies, especially the "Big Three" (Moody's Investor Service, Standard & Poor's, and Fitch Rating) that are used to assess creditworthiness – the ability to pay back debt, meet interest payments timeously, and estimate the likelihood of default. These bodies are used by investors to assess companies and organisations of all types, and to assess local, state, and sovereign governments seeking loans. Following a series of inaccurate ratings and forecasts, these rating agencies have been criticised for flawed methodologies, poor judgements, conflicts of interest, oligopolistic behaviour, and grossly inflated reputations. Again, there are misconceptions over the limitations of their assessments – their opinions have been vastly overrated. At the very least, a proper audit should expose corruption.

In conclusion, it is imperative that the limitations of various types of QA and relevance audits in academia are understood at the beginning of the process; poorly conducted and inadequate assessments are a waste of time and money, and could prove damaging. In order to avoid "group think" and monopolistic provision, there must be a diversity of independent external providers with no conflicts of interest, and appeals and complaints processes to contest judgements. There is also the expectation that self-assessments will be carried out, overseen by one or more committees, and that the audits will include all staff, including those in leadership positions; audits are not for junior staff only. Consultations with students and other stakeholders are also essential. QA and relevance audits will need to be constantly updated, not least as new priorities come to the fore, thus auditors will require training with refresher courses. Forensic-style QA and relevance audits may be necessary for failing universities or where there is evidence of corruption, where the focus must be on the roles and capabilities of the leadership. Quality and relevance audits of institutions of higher education and research institutes are axiomatically closely tied to the mission, aims, objectives, strategies, and ethos of the institution. At the outset, there must be trust in the auditors, the auditing processes, the responses of the leadership teams to the audit findings, and the findings themselves. Justifiable questions might be raised about the quality and relevance of the institution's mission, aims, objectives, strategies, and ethos. Parenthetically, mission statements often have a propensity to be meaningless slogans of grandiose utopian expressions

of virtue and pomposity, devoid of tangible statements about readily measureable intentions, e.g. treatment of staff emoluments and pensions, new courses, quality, competitive positioning etc. In order for the auditing role to be carried out, the institution must have accurate and dynamic databases and the associated information system. Audits cannot directly alter the operating environment in which a university finds itself, such as a lack of government funding, incompetent staff, a failure to address the needs of the jobs market, degraded infrastructure etc., but audits can point a constructive way ahead and may provide a beneficial influence.

In 2015, through the auspices of the United Nations, world leaders agreed to 17 Global Goals for Sustainable Development by 2030 [12], goals that will only be achieved if individuals, civil society, businesses, and governments work together. Goal 4, quality education, aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. The accompanying text states that education liberates the intellect, unlocks the imagination, is fundamental for self-respect, is the key to prosperity, and opens up a world of opportunity. We note that the term "quality" is not defined. The text further states that learning benefits every human being and should be available to all. Target 4.3 of the Goal refers to equal access to affordable technical, vocational, and higher education. Target 4.8 aims to expand higher-education scholarships for developing countries. Most Arab countries are usually classified as "developing" countries even though there are no universally agreed criteria for distinguishing between "developed" and "developing" yet there is widespread acceptance that the transition to the developed condition is only achievable through operating a modern knowledge-based economy, i.e. where the means of production and the service industries are based on intellectual inputs, knowledge, and high-level skills, rather than reliance on natural resources or manual labour. Developed economies are noted for their focus on research and development in science, engineering, and technology. Information and communication technology (ICT), protection and marketing of intellectual property, and complex financial markets have major features of developed societies. Goal 5, achieve gender equality and empower all women and girls, is seen as a fundamental human right and a foundation for a peaceful, prosperous, and sustainable world. Women and girls should be provided with equal access to education, healthcare, decent work, and representation in political and economic decision-making. By inference, the numbers and roles of women in leadership positions in universities, especially in the Arab world, should be examined and any disparities in representation corrected.

Higher education, also referred to as tertiary, third-level, or post-secondary education, is that optional final-stage phase of formal education characterised by the award of academic or academic-grade degrees or various forms of professional certification [13, 14]. It is carried out to variable levels of intellectual rigour in different types of institutions of higher learning, namely universities, tertiary-level colleges, various types of technology-based institutes or polytechnics that emphasise applied science and industry, and various types of academy. The modern technologically driven knowledge economy largely arises from the products of higher education, namely its graduates, postgraduates, discoveries, concepts, and inventions.

Universities are institutions of higher education and research, repositories and custodians of scholarship and its advancement, able to grant academic degrees and provide both undergraduate and postgraduate education. They should enjoy academic freedom, normally have a system of staff tenure, and are distinct in various ways from the society surrounding them [15, 16]. Academia refers to institutions, typically universities, concerned with studying and thinking in the pursuit of education, research, and the advancement of scholarship [17].

Defining quality in academia is complex and changes over time, as is agreeing the criteria that should be used to measure quality, and also agreeing the sort of remedial processes needed to bring about upgrades in quality. Assessing relevance is even more complex and often ignored or sidelined in many institutional assessments. This situation is changing in a highly competitive dynamic era of globalisation and rapid technological and social change, and is taking place at a time when reputations are now earned rather than assumed based on the longevity of an institution or claimed solely for marketing purposes. There is also the issue of accountability both to students who are now regarded as customers with consumer rights and rising expectations – thus they have the potential for litigation – and accountability to their sponsors (parents, governments, charities, companies etc.). This accountability issue may well be leading to grade inflation and a dropping in standards, thereby reducing the value of the "graduate premium" – the difference in average earnings of somebody with a degree from non-graduates. The so-called "return on investment" in education including higher education has been reviewed by Psacharopoulos and Patrinos for 139 countries and varies considerably [18]. Even excluding social gains such as reduced mortality rates, the returns are higher for girls and primary education but are especially strong for higher education. The authors comment on the race between education and technology and the rising demand for higher-level skills; the clear message is the need to invest more in education.

Accountability is counterbalanced by the concept of university autonomy (e.g. admissions policies, degree grades, staff appointments, discipline, financial management, etc.) and freedom from manipulative interference, including political opportunism and politically induced social engineering [19]. We recognise that autocratic regimes can be threatened by institutional autonomy just as universities in their jurisdiction can be suppressed and not realise the intellectual potential of their staff and students. In general, institutions are expected to achieve excellence in all their activities, as countries seek to create vibrant knowledge-based wealth-creating economies. At their heart, universities are essentially intellectually elitist but have major responsibilities to society as a whole while recognising that many academics can be somewhat detached from the realities of life for the rest of society.

The scale of the challenge to raise academic standards is enormous: there are an estimated 10,000–28,000 or even 30,000 generally accepted and self-acclaimed universities in the world [20, 21], and around 700–1000 universities and institutions of higher education in the Arab region [22, 23]. It is a general observation that towns and cities that host one or more universities enjoy better economic growth, a higher

standard of living, and more sophisticated cultural life. There is also a "cluster' effect in attracting start-up as well as established companies wishing to capitalise on access to graduates and research programmes. According to the Economist [24], between 1995 and 2014 government spending on higher education in the OECD rose from 0.9% of gross domestic product to 1.1%, while private spending rose from 1.2% to 1.5%. This picture probably mirrors spending in most other countries. As government subsidies for tuition fees flow through to institutions they have helped inflate costs. More detailed analyses of the graduate premium in every country are required, not least when data for dropouts and different subjects are included. Some degrees are more valuable in terms of career prospects and lifetime earnings than other degrees and qualifications. As degrees become more common, employers have become more demanding, even for jobs that hitherto did not demand a degree qualification, leading to a degree-devaluation phenomenon that in turn gives rise to the concept – and measurement – of "over-education" [24, 25] thereby giving rise to a surplus of certain kinds of graduates and even postgraduates. Countries seem to have skills and competencies shortages, not degree shortages, but are still engaged in an "arms race" to increase university enrolment whereas more attention needs to be given to raising quality and relevance in universities as well as focusing on other areas of education and training. Some universities have massive expansion plans and take out loans on the basis of linear thinking that student numbers are bound to increase, and imperilling the future of the institution in times of recession and high interest rates. In assessing institutions of higher education, the auditing team should not only address the question of whether the education and training received by a student meet the aspirations of the student, the aims of the sponsors (governmental and/or private), and, increasingly, national economic and social goals, but also consider financial viability. So it is not simply a matter of education quality and relevance. In essence, is the institution a "going concern" capable of managing change?

Coming to terms with the potential worth and changing roles of higher education is even more complex than generally appreciated, as outlined in the 21st Century Skills Framework [25] whereby it is generally accepted that the share of manual and routine cognitive labour is declining and the share of non-routine cognitive labour is increasing. Formal education must now focus on new skills and attitudes ("future-proofing") required for the realities of the modern knowledge-based enterprise economy. These encompass: global awareness; financial, economic, business, and entrepreneurial literacy; civic literacy; health literacy; creativity and innovation; critical thinking and problem solving; communication and problem solving; communication and collaboration; information literacy; media literacy; ICT literacy; flexibility and adaptability; initiative and self-direction; cultural and cross-social skills; productivity and accountability; leadership and responsibility; and environmental literacy. As Sidorkin and Warford state [26], we have not learned how to measure skills that include critical and creative thinking and emotional and social intelligence. In 2014, Rogers and Daines made the point that there are five major transitions that make historically based thinking obsolete [27]. The first is the urban-population transition referring to the majority of the global population now residing in cities and having increased purchasing power. The second is the nutrient transi-

tion with demands for a new basket of foodstuffs with greatly increased consumption of animal products and other high-value foods. The third transition is the agricultural transition that brings almost all of the arable land into agricultural food and fibre production. The fourth transition is the energy transition from cheap fossil fuels to renewable-energy resources. The fifth global transition is the climate transition of increasing temperatures and increasing variability in water supplies and growing conditions for plants. All of these transitions are exacerbated by global population growth and are happening at different rates in different countries. In the 2016 'Future of Jobs Report' by the World Economic Forum [28], the point is made that the world is at the beginning of a Fourth Industrial Revolution with developments in genetics, artificial intelligence (AI), robotics, nanotechnology, 3-D printing, biotechnology etc., all interacting and amplifying one another. These technology-based developments are disruptive forces challenging existing industries, creating new products, changing patterns of consumption, and reshaping patterns of employment. They are therefore socio-economic and geopolitical drivers of change (Sect. **7 Relevance**). Employers are now looking for candidates with cognitive flexibility, judgement and decision-making skills, emotional intelligence, critical thinking, creativity, and ability to carry out complex problem solving. Management in many universities worldwide has followed the lowest-common-denominator method of relatively short-term managerial positions (e.g. heads of departments) leading to weak decision-making and an inability to set and deliver long-term goals. In other words, leadership has yielded to low-level managerial convenience.

Adaptations needed to meet the challenge of producing graduates and postgraduates with these modern attributes to populate companies and the public sector are especially difficult for universities, especially those constrained by an inflexible organisational model structured along traditional subject/disciplinary lines. Many are unprepared for lifelong learning [15], let alone QA of their distance or online coursework. Many universities will need to adapt to the declining importance of a residential campus. To avoid extinction, some will need to transform in their entirety rather than undergo mild reforms, and others will be forced into mergers. Against a backdrop of widespread and continuing education reforms, and a steep rise in costs, many universities have not properly adapted to embrace the benefits of information technology that are also essential for QA and relevance assessments [26, 27]. There are too few routine assessments of both student learning outcomes and changing market demands for graduates and postgraduates. Countries also vary in the demographic, social, and economic pressures they face and consequently in the type of graduates they need. Unless there is an active policy of encouraging "brain drain", there needs to be complementarity between university outputs and the needs of a country, especially where taxpayer support is given. University teaching and supervisory staff have a duty to stimulate analytical as well as divergent and convergent thinking (fluid intelligence) in their students, encourage imaginative ideas, and challenge orthodoxies and generally accepted concepts and processes. An academic environment sensu stricto demands free speech, open debate, and (sometimes) heated argument, yet it must remain collegiate and a centre of interdisciplinary

cross-fertilisation i.e. intellectual heterosis, a process facilitated by technology as well as personality. Pejorative aspects of political correctness should be avoided where debates are censored and where bias is deliberately disguised.

Another challenge for universities (and advanced research institutes) around the world is the steady loss in the mind-set of a significant proportion of academic staff of accepting the sacrifices needed to be a dedicated professional academic and having a lifelong vocation. Indeed, all forms of conventional employment are in decline and employees must demonstrate flexibility and continual up-skilling. Too many academics wantonly become straightforward routinely working-minimally-to-contract employees and members of those types of trades unions (rather than true professional bodies) aiming to extract maximum benefits for minimal effort from employers and conducting direct political actions to bring about social engineering often unrelated to the direct needs of their members. Most modern trades unions are noted for their strong resistance to change and new ways of working, two features that must become mainstream in universities as they adapt to the needs of the employment market and the profound effects of rapidly developing technologies. This attitudinal challenge to employees is one facing nearly all other professions worldwide, and some professional bodies themselves are behaving like some aggressive trades unions and constraining trade and competitiveness rather than fostering professional development (Sect. 7 **Relevance**). This trend will be inevitable if universities fail to recognise (a) equality and human rights; (b) fairness in appointments, promotions, emoluments, and discipline; and (c) meritorious achievement in teaching, research, and administration. Universities are not typical employers. The advancement of civilisation is dependent on high-quality teaching and research, professions that deserve to be rewarded at levels to reflect their immense societal values. Bad teaching and research are dangerous and a menace and should be curtailed forthwith. Proper QA assessments will help distinguish between good and bad, and uncover whether the university upholds basic human rights and acts fairly. Such assessments will also reveal the capacity of the university to manage its professional staff. Bad publicity and closure should face those institutions that cannot manage their staff properly, for example, those that behave arbitrarily or contractually impose inflexible mandatory-arbitration agreements on academic staff so that the right to use the judicial system is signed away. These agreements are associated with a failure to disclose actual and potential conflicts of interest with arbitrators and a refusal to publish their decisions. In some countries, however, unacceptable working conditions in universities may be a result of direct government policies, giving rise to the need for representative bodies able to articulate the concerns of their members and negotiate improvements.

In a globalised world, the issue of cross-boundary and transnational recognition of academic qualifications is coming to the fore. Those carrying out appointments cannot depend on a simple degree certificate and personal contacts and written references, hence the widespread acceptance of independent (external) internationally recognised QA assessments, diploma supplements, and other measure to ensure the validity and relevance of degree and professional qualifications. Confirmation of the validity of academic qualifications should be easily and reliably checked with the issuing institution (Sect. 12 **Conclusions**).

An important criterion of being given permission by governments to establish and operate an institution of higher education must be that it receives periodic independent and competent QA assessments. Independence of assessment is crucial in order to grant as much autonomy as possible, irrespective of receipt of government financial support or the holding of charitable status. University autonomy does not preclude a positive relationship with the host country and government. Autocratic governments in the Arab region have tended to be heavy-handed in their dealings with universities, both public and private [19], much to the detriment of both as evidenced by weak economic and stunted social development. Much could be gained by allowing universities to express their full potential of creativity, innovation, and entrepreneurship by providing relevant, high-quality education and research. To this end, we respectfully recommend ten changes to Arab government policies to provide a buoyant operating environment. (a) Formal recognition of intellectual property rights including copyright, and have full engagement with the World Intellectual Property Organization. Governments should offer guidance to universities on the protection and marketing of their intellectual property, copyright, and specialist know-how. (b) Appointment of chief medical and chief scientific officers with active roles in formulating evidence-based policy, drawing heavily on university and business expertise and international examples. (c) Commission national technology foresight programmes and horizon-scanning panels to help guide investment strategies for research of national importance and to address the need for lifelong learning in an era of fast-developing technologies. Review the quality of existing research facilities and expertise. (d) Establish a limited number of well-led, well-funded research centres as centres (nodes) of excellence in concert with outstanding universities to ensure a flow of talented staff and postgraduate students. Funding continuity is a prerequisite for productive research and development. Engage with other Arab countries to establish regional centres of excellence with facilities and expertise available to universities with meritorious proposals. (e) Encourage leading international companies to offer advice and provide inward investments. (f) Interact to a much greater extent than hitherto with the relatively few major non-governmental sponsors of research; with the funds, programmes, specialised agencies of the United Nations; and with the 29 Development Assistance Committee (DAC) members and 10 non-DAC members of the Organisation for Economic Co-operation and Development (OECD). (g) Make it much easier and quicker bureaucratically to establish and operate a business. Restrict severely employee contracts that make it difficult or even prevent workers from moving jobs or establish competing companies (non-compete clauses). Encourage a dynamic investment community; in particular, promote the formation of venture-capital and "business-angel" communities and groupings of other types of investors willing to interact with centres of higher education. A robust and reliable legal system is a prerequisite. (h) Assist directly in career development of the most talented young people (males and females) by providing undergraduate grants and scholarships either through ministries or by specific funding allocations to universities. (i) Fully utilise the knowledge base of universities in creating and developing policies and strengthening civil-society institutions and human rights. (j) Respect the need for

universities to have autonomy from government interference in their appointments, structures, and modus operandi if they achieve satisfactory independent external QA and relevance assessments, and are not independently verified to be corrupt or demonstrably incompetent, in which case the law can take its course. The region is presently one of where entrenched patriarchal social mores oftentimes supersede economic opportunities, quality of life, and common sense in this modern world. Arab universities and governments need to work in concert.

QA and relevance assessments require careful planning, and should interrelate to internal assessments of competence levels in administration, governance, teaching, and research. There are no off-the-shelf software packages that can deliver proper assessments to all of a university's functioning. Care and advice are needed when embarking on assessments for the first time. Quantitative and qualitative information will be analysed, thus an efficient and comprehensive information system will be a prerequisite. Decisions will be needed to select specific areas of the university to be assessed. A pointless one-off superficial exercise will breed cynicism, and rightly so. In brief, the assessment will generally involve nine critical stages: identification of assessment areas and judgement (weighting) criteria; guidelines for conducting the audit; selection of the auditors; benchmarking and comparators; interactions with representative stakeholders (staff, leadership, students, government, industry, civil-society groups); holding of the audit; reporting; action plan; and follow-up analysis. At more philosophical, moral, and ethical levels, each academic member of staff should question what they do and do not do, and address their duties, obligations, deficiencies, and responsibilities. QA assessments are not simply about processes and procedures; the products (outputs) have to be assessed. Put at its most basic level, QA and relevance lie at the heart of university governance, management, and day-to-day management. Instantly available, comprehensive, and readily analysable datasets of all facets of a university are now the starting point of QA and relevance audits in this era of the digital revolution.

## 2 Assessment of Primary and Secondary Education

Higher education has much to learn from international developments designed to compare institutional performances and aid in improving quality taking place in other sectors of education. In primary and secondary education, various international initiatives are influencing the adoption of educational best practice. Two initiatives in particular, are of note, namely (a) the OECD – a club of 35 members of mainly developed economies and three emerging economies of Chile, Mexico, and Turkey, but no Arab countries – with its Programme for International Student Assessment PISA [29], and (b) the International Association for the Evaluation of Educational Achievement [30] that conducts large-scale transnational comparative studies [31] such as Trends in International Mathematics and Science Study; Progress in International Reading Literacy Study; International Civic and Citizenship Education Study; Computer and Information Technology in Education Study; Early

Childhood Education Study; International Computer and Information Literacy Study; and Teacher Education and Development Study in Mathematics. National and regional school "league" tables that draw on publicly available performance data supplement these initiatives, often to the chagrin of teacher trade unions. Some nations have regular assessments of schools by government agencies or units that operate on the visiting-group principle whereby a small party of experienced teachers carry out on-site inspections.

## 3 Higher-Education Institutions in the Arab Region

Universities and institutions of higher education are remarkably diverse, especially in the Arab world [32]. Few Arab universities figure in international ranking tables. They encompass organisations that are classified either as in the public sector or in the private sector (profit and non-profit); some universities in other parts of the world with major commercial arms and satellite bodies have a form of hybrid structure. Arab universities range from long-established and august bodies to newly established organisations; from well-resourced financially to severely financially constrained; pure- and applied-research focused to undergraduate focused; entirely religious in approach to entirely secular; wholly autonomous from to wholly accountable to government; establishments encouraging business engagement and including commercial arms, incubator ("business hatcheries") units, and spinouts to establishments lacking tangible commercial links; those establishments expanding in personnel and resources and sometimes satellites to static establishments; institutions recruiting international staff and students to institutions confined to a single national, religious, or ethnic group; some have few gender issues, others are bastions of male chauvinism with minimal adherence to gender equality; those having major societal impacts locally and nationally to those with minimal positive effects in their host country; in socially stable areas or in areas of conflict; those that are successful in producing enterprising and entrepreneurial employed graduates to those noted for producing unemployed or underemployed graduates (in other words, a mismatch between supply and demand and responsible for a waste of human capital and resources); those that are noted for creating knowledge to those noted only for disseminating knowledge within their institution; those operating with integrity, transparency, competence, and offering value for money to those that do not; those able to identify and drive solutions for addressing national and regional priorities to those that do not; institutions fully capitalising on ICT with associated online courses and lifelong and distance learning to those that depend on traditional approaches to teaching; those producing valuable wealth-creating intellectual property to those that do not; those that actively carry out independent quality-assurance assessments to those that do not; those with accurate and informative websites to those with minimal, out-of-date, or even misleading websites; and those with straightforward marketing approaches to those with deceptive, high-pressure marketing that is akin to mis-selling. There are legitimate questions as to whether

certain higher-education institutions deserve the title "university". Nonetheless, it is clear that given the heterogeneity of the higher-education sector in the Arab world, "one size does not fit all" with regard to assessing independently the quality and relevance of academic institutions.

Rarely do current types of independent QA assessments cover effectively all the facets that comprise a higher-education institution. Despite institutional heterogeneity, assessments must be capable of providing reliable data that can be used for cross-institutional comparisons and for revealing institutional strengths and weaknesses, thereby aiding in the identification and uptake of best practice, and elimination of unacceptable practices. Change is urgently needed. High student enrolments in the Arab region are associated in particular with unacceptable levels of graduate unemployment and underemployment, weak and unstable economies, relatively little manufacturing industry, no proper modern knowledge economy, and poor records of generating valuable intellectual property [15, 32]. These facts are an indictment of the worth and relevance of the majority of Arab universities and their weak influence on governments. There are also worrying levels of "brain drain" (losing large numbers of talented citizens to more successful parts of the world), compounded by low-grade hard (e.g. road, rail, airport, utilities, telecommunications etc.) and soft (e.g. education, banking, healthcare, legal systems, civil defence etc.) forms of infrastructure, weak civil-society institutions (including academic societies), widespread civil unrest, and autocratic governments. The checks and balances over the exercise of governmental power require civil-society groups including charities, volunteers, localism, and freedom of expression and the freedom to choose in order to protect individuals and families against a centralised power that invariably drives people into dependency on and control by the state. All these issues retard the full involvement of the Arab world in the globalised economy and undergoing the transition to a prosperous peaceful future. Moreover, four war-torn Arab countries (Iraq, Libya, Syria, and Yemen) require unprecedented levels of investment and the creation of new hard and soft infrastructures.

There are other profoundly difficult issues to resolve, difficult because they require goodwill, an attribute seemingly in short supply. Discord in the Arab world became inevitable because of foreign interference; Arabs are both victims and participants in big-power politics, and will need assistance from the international community. In very brief historical summary, a dramatic reshaping of the Arab world took place following the defeat in the region of the Ottoman Empire (founded in 1299 and dissolved in 1922) by the Allied Powers (British Empire, French Republic, Russian Empire, Italy, and Japan, with Belgium, Greece, Montenegro, Romania, and Serbia as affiliates) during World War I (started by Germany and Austria-Hungary plus other actors and dragging in other participants). Pivotal in the various and all-too-numerous transformations adversely affecting Arabs taking place in the region thereafter were two crucial events. Firstly, the Balfour Declaration (November 2, 1917) by the British Foreign Secretary, Arthur Balfour, announced support for the establishment of a national home for the Jewish people in Palestine. This declaration included the caveat that nothing shall be done which may prejudice the civil and religious rights of existing non-Jewish communities in Palestine. Secondly,

following large-scale emigration of Jewish people to Palestine and the dramatic effects of World War II (started by Germany), the formation of the state of Israel (May 14, 1948) uprooted 750,000 Palestinians whose anguish, and that of millions of their displaced descendants, continues to this day. The region was profoundly destabilised, kindling what seems to be permanent religious, ethnic, and political discord in and beyond the region. Peaceful intermingling of different peoples and religious tolerance, once so characteristic of the Middle East, is giving way to geographically separate sectarian groupings, and rapid shrinking in the number of minorities in communities. Adding to the complexity was the Six-Day War in June 1967 that brought over one million Palestinians in East Jerusalem, the West Bank, and Gaza under direct Israeli control, as well as Israeli forces taking control of the Golan heights, in so doing displacing the Syrian inhabitants. With regard to the driving forces underpinning the establishment of modern Israel, anti-Jewish sentiments have been recorded as far back as the third century BCE and continued thereafter, especially in Europe. Along with lesser but numerous examples of anti-Jewish events in Europe, pogroms (violent persecutions) in the nineteenth and twentieth centuries of mainly Ashkenazi Jews in Russia, Ukraine, Belarus, Lithuania, Moldova, Poland, and culminating in the Holocaust genocide of 6 million Jews by Nazi Germany during World War II, provided the strongest possible motivation for Zionism to develop by mass Jewish immigration (Sephardic and Mizrahi Jews as well as the Ashkenazim) a safe haven, the new reborn Jewish nation, Israel, in Palestine. Parenthetically, "anti-Jewish" is often described using the misnomer 'anti-Semitism', a term devised in 1879 by Wilhelm Marr, a German journalist and political agitator; there are over 70 Semitic languages, principally Arabic, Amharic, Tigrinya, Hebrew, Aramaic, and Maltese but the term "Semitic" has additional cultural connotations. In whatever definition to encompass one or all types of Semitic people, anti-Semitism remains a repugnant form of hatred.

Compared with the malign effects on Arab civilians of the creation and maintenance of Israel as currently governed, the scale of the displacement of Syrians by the current unrest vastly outnumbers that of the dispossessed Palestinians (approximately 6.5 million Syrians internally and approximately 6 million outwith Syria at the time of writing). Surrounding countries and parts of southern Europe are feeling the effects of this displacement. Elsewhere in the Middle East, violent religious fanaticism and ethnic discords continue. Terrorist events by Islamic and Arab extremists and the behaviour of Arab regimes with harsh religious-based autocratic civil law have collectively spawned anti-Arab and anti-Islamic attitudes in other parts of the world. The effects of the Arab Spring that began in December 2010 in Tunisia are yet to work their way through most Arab countries. Only the revolution in Tunisia has resulted in the transition to a constitutional democratic, albeit fragile, government. This situation emphasises the extreme urgency and enormity of the challenges facing the Arab world and its wider geopolitical implications. If the contagion of civil war were to spread to the more populous Arab countries, then migrants and refugees would be forced to besiege European countries in the first instance.

The Middle East is a cauldron of incompatible emotions and grievances shaped by various interpretations of history and religion; it desperately needs to make progress to achieve a peaceful and prosperous future in a globalised world. There is no other option than for these challenges to be met with the direct aid of the international community, for four sound and obvious reasons. (One) The involvement in the region of foreign actors that include: (a) the pogrom and Holocaust countries in Central and Eastern Europe; (b) the imposition without consultation of wholly arbitrary national borders where none existed before by the UK and France (represented by Colonel Sir Mark Sykes and Francois Georges-Picot and the 1916 secret Asia Minor Agreement) giving rise to several new multi-tribal, multi-faith nations with synthetic, fragile borders and split river basins and other geographical and natural-resource features; and (c) involvement of numerous other foreign countries including other Islamic countries actively and covertly involved in conflicts and causing chaos and destruction. Indeed, both World Wars involved Arab countries at a time when most Arab countries were colonised. (Two) The diplomatic and financial resources needed to address the multiplicity of challenges are far beyond the capacity of the region. Most Arab countries have chronic weaknesses of their public finances. (Three) A functional and peaceful modus vivendi is needed with Israel, protecting the lives of all, and especially throughout the region the rights of peoples of all faiths and none, and their access to their property and natural resources including water, minerals, oil and gas, and fishing rights, or the award of appropriate reparations. The caveat in the Balfour Declaration has yet to be fully respected. The Arab world has much to learn from the culture of innovation and entrepreneurship culture of Israel. (Four) Resolving the problems arising from the Syrian crisis will involve complex multinational, multi-agency, and resource-provision negotiations, made much more difficult by the scale of the conflict in Yemen and migration pressures from parts of Africa for the most part through Libya. Most pressing are the immediate challenges of housing, food, fresh water, and meeting the educational needs of displaced civilians, persecuted minorities, asylum seekers, and refugees. Special praise must be given to the stoicism and resilience of Arabs in attempting to sustain academic rigour in times of conflict, dire finances, dysfunctional politics, and truly dreadful circumstances. Arab universities have the basic responsibility to improve the quality of life and wealth creation of all the peoples in the region, interacting positively with the rest of the world. In turn, the rest of the world has to recognise and allow for the exceptionally difficult environment in which nearly all the Arab universities and societies function. Beyond the politics and most concerning of all in the medium to long term, the air-conditioning-dependent Arab region is projected to suffer severe climate-change impacts affecting water, energy, and food sustainability with consequential effects on economic and social stability [32, 33]. In the absence of effective global emissions controls, concerted efforts are needed to adapt to formidable environmental changes so as to guarantee water, food, and energy security. These adaptations require innovations and entrepreneurial initiatives expected in large measure to come from universities in the region. In view of the fact that we live in a competitive world, a pusillanimous approach to QA and relevance of their education and research by many Arab universities would imperil

not only their future and the careers of their alumni and alumnae, but the entire populations of Arab countries. Prolonged difficult conditions can lead to more outright dictatorships or populist non-democratic majoritarianism, postponing prosperity and peaceful conditions.

We now turn to the issue of corruption in academia, an uncomfortable topic that contrasts with the concepts of truth, ethics, and morality that are fundamental to the modus operandi of every university worthy of its title (Sect. 7.1 ***Relevance and Responsible Science***). Academics should be the arbiters of truth, and act morally and ethically. In our chapter "The Future of Arab Universities in the Arab Region: A Review" [15] in the book "Universities in Arab Countries: An Urgent Need for Change" [32], we made the following comments. "Corruption is an uncomfortable topic in developing countries; it can and does occur in any country but once deeply embedded as in many underdeveloped countries, it is exceptionally difficult to reduce or even eliminate. Factors underpinning corruption affect all layers of society and include weak democratic norms, poor political transparency, excessive bureaucracy coupled to an inefficient administration, lack of media freedom, pronounced ethnic and religious divisions and group favouritism, gender inequality, excessive size of government and little decentralisation, inadequately rewarded public servants, weak judiciary and police, influence of corrupt neighbouring countries and criminal networks, and low internet access. Corruption in education afflicts admissions, appointments, the award of marks and grades, disciplinary actions, promotions, allocation of grants and other resources, and access to corrupt hierarchies. Confidence in the integrity of a university in the Arab world, no matter how highly it is regarded generally, collapses when it fails to address robustly and openly serious issues of corruption. These issues include plagiarism; data manipulation (fiddling results) and more general falsification; attempts to extract money from students for personal gain; making false accusations (never underestimate the vindictiveness of the corrupt); taking unjustified credit for the achievements of others; cronyism; and covert lobbying of influential ethnic or co-religionist people. Expressions and symptoms of corruption include false accusations against whistle-blowers (described as "troublemakers"); termination of investigations or manipulating the membership of investigatory committees, or even disregarding the results of investigations; covert meetings to suppress whistle-blowers sometimes by denying them promotion and/or resources or even sacking them; and blocking electronic communications. Fortunately, as the general level of education improves and people express their fundamental ethical principles common to all modern cultures, tolerance to corruption at all levels of society rapidly decreases. When you wash the stairs, start at the top. There are many sets of stairs in universities. Corruption must be recognised at an early stage and squashed. The International Institute for Educational Planning, part of the United Nations Educational, Scientific & Cultural Organisation (UNESCO), set up a global online database (ETICO) and information centre for tracking the misappropriation of education funding. Corruption in education is also highlighted by Transparency International, the Berlin-based anti-corruption campaign group, in its surveys of students about demands for bribes in the course of their studies. More generally, corruption needs to be addressed at a national level so

that any corrupt gain is much less than any penalty and the likelihood of being caught and prosecuted or exposed is greatly increased by a combination of enhanced transparency of decision-making and financial information, all overseen by strong independent regulators that the public can access freely. Transparency depends on active and independent broadcast and publishing media, and can be aided by the social media although the advent of false news and the covert involvement of governments in spreading such news and provoking discord are worrying development. Strong moral-based civil-society institutions have an important role, too. Governments should set the ultimate example, but surely so should universities." We have good reason to believe that the corrupt practices outlined above do take place in the region (and, it is important to emphasise, elsewhere), as well as the sale of fake degrees to aid career progression and universities paying academic staff from elsewhere to modify the addresses on their publications so as to falsely improve institutional performance. QA and relevance assessments must search out evidence of corruption.

Assessments and the formation of strategies to improve quality and impact can take many forms, and include (a) university rankings (Sect. 4 **University Rankings**); (b) use of external QA and other auditing bodies, or conducting internal QA exercises (Sect. 5 **Quality Assurance and Higher Education**); (c) visiting groups or teams (Sect. 6 **Visiting Groups or Teams**); (d) bibliometrics and citation metrics (Sect. 8 **Bibliometrics and Citation Metrics**); (e) seeking peer opinions on reputation (see Sect. 9); (f) SWOT analyses (Sect. 10.1 ***Preparing for the Future: Strengths, Weaknesses, Opportunities, and Threats***); (g) horizon-scanning, trend impact analyses, scenario methodology, Delphi, and Foresight exercises (Sect. 10.2 ***Preparing for the Future: Horizon-Scanning, Trend Impact Analysis, Scenario Method, Delphi and Foresight Exercises***); (g) separate targeted reviews by professional bodies; and (h) consideration of the relevance of curricula and the research and development programmes by conducting analyses of the multifaceted consequences of receiving higher education on employability and impacts made by graduates, postgraduates, and university staff on civil society and government (Sect. 7 **Relevance**). To be credible and have a positive impact, these assessments (other than the separate rankings publications) and strategy-development processes need the trust of the staff, unless there are valid reasons to do otherwise. They must be fair. They must not be excessively time-consuming, highly bureaucratic box-ticking exercises organised and conducted by people unversed in the realities of university life and the specific characteristics of the university under review.

In judging a higher-education institution for quality and relevance, there are less-tangible, more-difficult-to-quantify indicators that provide assessors with an appreciation of the degree of intellectual vibrancy, energy, potential, and happiness. Such indicators can be gleaned from confidential staff interviews, comments in feedback exercises seeking the opinions of staff and students, the nature of social and sporting events, comments in social media, publicity and marketing releases, litigation cases, views of alumni and alumnae, etc.

## 4 University Rankings

The advent of international university ranking tables and their influence on public perception, student enrolment and staff appointments, as well as on sponsoring bodies means that the behaviour of universities is changing in a competitive interactive world. Some universities even employ the equivalent of "ranking managers". The three most important of the 20 or so global ranking organisations (Times Higher Education World University Rankings [34], the QS World University Rankings [35], and the Academic Ranking of World Universities by Shanghai Jiao Tong University, now maintained by the ShanghaiRanking Consultancy [36] as well as the plethora of other ranking organisations, use differing judgement criteria, and in many cases can give a misleading picture of the real quality and relevance of a particular course of study. Some rankings focus on subject areas and geographic areas [32]. Wealthy research-focused institutions with strict entry requirements dominate the rankings. Questions can justifiably be asked about the sources, objectivity, veracity, selectivity, relevance, weightings, and interpretation of the data used by the ranking organisations, and the statistical robustness of the comparisons. Emphasis is placed on reputation and especially scientific and technological research such that teaching in general and research in the humanities and social sciences may suffer as a consequence. Nonetheless, deficient as they might be, rankings are widely used as one of the few key criteria to assess the quality and value of named universities; more particularly, they are deployed to allocate resources and set aims and ambitions of institutions. Scrutiny of the rankings may pander to competitive urges and provide examples of national pride, and even assist in parents and students in buying prestige and societal influence. They also lead to an inevitable stratification of universities within a country. Increasing the sophistication of rankings and thereby other forms of assessment both within and between institutions will be facilitated by deploying a range of academic search engines in conjunction with a variety of types of AI. At present, no Arab university is in the top rank, and there are no true research universities.

## 5 Quality Assurance and Higher Education

Conventional QA in respect of higher education has become complex, in danger of placing undue emphasis on monitoring a relatively narrow selection of the processes involved in running a selection of university activities, rather than adopt an approach that is both holistic and concentrates on outcomes. This latter approach essentially means a focus on four questions, namely (a) what becomes of the graduates and postgraduates, how do they contribute to society, what do they think of their university education, and did they get value for money? Employers may also be asked for their opinions. (b) What intellectual property, novel processes and concepts, copyright, products, and scholarship mainly but not exclusively in the form of

research papers, books, and patents come from the university? (c) Does the university contribute positively to civil society, government, wealth creation, and the quality of life? (d) Does the university deserve its title and reputation? With time, QA analyses will become broader in perspective with routine self (internal) and external assessments, and will probably become mandatory for nearly all universities. Teaching and supervisory staff will need specific training and opportunities to update and develop their skills.

Specific areas in academia for examination by independent QA assessors should (but rarely do) include all aspects of a functioning institution (Table 1). Questions need to be asked about the extent to which the institution fulfils its mission and aims. How efficient and transparent are the governance and management processes? Are the managerial strategies sustainable? The degree of institutional autonomy and involvement of government need to be probed. Financial management is a determinant of the viability of the organisation, thus questions need to be posed about the annual accounts and the roles of internal and external auditors, strategies for "balancing the books", control features, risk assessments and resilience, and the extent of devolution of financial and other decision-making responsibilities to other parts of the organisation. Are the admission criteria applied fairly or are certain groups given special status, and are scholarships available for talented people? Of particular importance are examination standards and their compliance with international and national norms. Are external examiners used, on what criteria are they appointed, how are they used, and what methods are used to prevent cheating and erratic or unfair marking? Are the qualifications issued by the institution recognised by officially recognised professional bodies and other institutions of higher education? What procedures and type of contracts are used in the recruitment, retention, training, and promotion of high-quality staff? Is tenure offered and does it apply to staff deemed to be excessively difficult (as opposed to eccentric, a special characteristic of many academics) or incompetent by their colleagues? How is tenure defined, and is there a pre-determined cut-off point e.g. when positive contributions come to an end? To appoint, promote, or offer tenure to a person who has been shown to falsify or plagiarise research, and forced to retract their work, would be a particularly severe indictment of the senior management of an institution and the people on the relevant committees; the confidence and commitment of honest staff will be undermined and the reputation of even the most august institution sullied. Sometimes institutions are unaware of the efficiency of international academic networks in informing colleagues about the presence of suspect academics. Are regular teacher/lecturer/professor performance assessments with adequate feedback carried out and by whom? Is there evidence of lacklustre teaching? The quality and fairness of disciplinary measures should be examined. Are staff members involved in national and regional priority setting and in public engagement? Detailed productivity measurements must be provided e.g. staff-student ratios; research income used for supporting postgraduate students, research fellows, and use of the fabric of the institution and its condition; bibliometrics; utilisation of facilities and equipment; support staff to teaching and research staff ratios, etc. The learning environment (e.g. range of subjects, cross-disciplinarity etc.) and student experience (e.g. access to library,

**Table 1** Summary of key points to be addressed in external and internal quality-assurance and relevance assessments of universities in the Arab region and elsewhere

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| Quality (accuracy, comprehensiveness, readability, submission on time) of documentation prepared by host institution for the initial external QA/Relevance exercise and proposals for ongoing internal QA/Relevance assessments |
| Evidence of quality in teaching, research, and societal impacts included in documentation provided by host institution |
| Who appointed the external assessing organisation and why? Who are the individual appointed as assessors and are they suitable? |
| Mission, aims, and strategy of the institution – are they realist, aspirational, and fit for purpose? |
| Verification of legal status and powers to award degrees, and the legal powers to receive, invest, and disburse money and other assets |
| Evidence of mutual recognition of degrees and diplomas with other universities |
| Extent of institutional autonomy and level of accountability (and possibly level of external interference) with respect to government, sponsors, founders, and owners. Powers to appoint and dismiss senior staff, and determine salaries. Processes needed to deal with authoritarian governments |
| Procedures for updating statutes and ordinances |
| Functional links with other universities, research institutes, international agencies including UNESCO, and non-governmental organisations. Includes Memoranda of Understanding and legal commitments |
| Extent of social instability and poverty in student-catchment areas, with strategies to identify talented students |
| Arrangements for dealing with emergencies (security, diseases and health issues, ionising radiation leakages, utility problems, fire, environmental disasters etc.) |
| Organisational structure and extent to which it conforms to courses; services offered to assist teaching and research staff. Proportions of staff on permanent contracts to staff on short-term contracts |
| Governance structure. Powers to establish and close committees. Processes involved in appointing senior posts and board members; duration of senior appointments; transparency of operation and consultations with students, staff, and sponsors |
| Financial arrangements, including full independently audited accounts, risk assessments, investment strategies, financial resilience as “going concern”, and reserves; preferential purchasing arrangements; fairness of the emoluments/remuneration system. Costings and pricing policies: are full economic costs applied to all activities; are fees based on full-cost recovery or what the market will bear, or are losses continually being incurred and accrued? |
| Administrative efficiency, including ICT/computing arrangements to analyse data about the institution and communicate with staff, students, governing board, sponsors, and government. Record keeping for main committees. Range of other services provided by the administration section. Administration staff as a proportion of teaching and research staff |
| Details of asset registers of tangible (land, buildings, capital equipment, vehicles and other forms of transport, valuable artefacts and works of art, stocks, etc.) and intangible (intellectual property, copyright, trademarks, specialist know-how including specialist software creation, advertising endorsements, proprietary relationships etc.) assets kept, valued, and regularly updated. Details of synergies and potential synergies in the institution’s human and other assets. Duration and type of intellectual-property protection |
| Duties and efficiency of the Personnel and Human Resources section |
| Organisation of degree-awarding and other ceremonies |

(continued)

**Table 1** (continued)

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| Security and confidentiality of records, including prevention of computer hacking, malware, and viruses |
| Production of annual reports, handbooks, other publications, and their distribution, and links to website updating |
| Staff-employment contracts and tenure; age profiles; staff-student ratios |
| Staff facilities and welfare. Procedures and reasons for offering sabbaticals. How does the institution ensure members of staff keep up to date and develop their skills portfolio? |
| Details and frequency of staff performance assessments and competencies in teaching, research, administrative duties, and public engagement. Teaching commitment relative to research and other duties. Comparisons of performance indicators and workloads with other similar institutions nationally and internationally. Extent of collaborative research with other organisations. Is there ready access to advanced statistical advice for designing and analysing experiments? |
| Staff recruitment, induction training, retention, and promotion processes; turnover; proportion of foreign staff; language skills |
| Operation of disciplinary and ethics committees, with evidence of actions taken. Are there mandatory-arbitration agreements in operation and are conflicts of interest declared and decisions published? How are cases of plagiarism (readily assessed using software tools), falsification of results, stealing, and other forms of corruption dealt with and what is the evidence of effectiveness? |
| Operation of committees for health and safety, equality, and diversity, with evidence of actions taken |
| Diversity of courses and curricula and the extent to which they are up to date; reasons why some academic subjects are not covered; arrangements for planning and timetabling lectures, practicals, seminars, tutorials, and examinations; processes involved in opening new courses and closing down redundant courses; availability of modern online courses and lifelong learning; teacher-training courses; course reviews using external advisors; contact time with supervisors, including time spent in lectures and laboratory practicals; feedback from students on coursework and teaching staff; expected learning outcomes including skills and competencies |
| To what extent do the courses/curricula match market needs and incorporate disruptive technologies? |
| Student recruitment and retention, including student numbers; proportion of national enrolment; degree-completion rates; diversity of educational backgrounds, nationality, religion (if any), and ethnicity |
| Availability of scholarships for talented students. Prizes for outstanding performance in examinations and postgraduate studies. Financial hardship funds |
| Examination processes, including robustness of methodology of setting of examination papers and methods to prevent all forms of cheating and unfair marking. Appointment, roles, and uses of external examiners – are they subject to QA and relevance assessments? |
| Student costings and receipts; dealing with outstanding debts |
| Student facilities (accommodation, recreational, transport links, parking, exercise, welfare) |
| Are transnationally recognised Diploma Supplements issued with degree certificates to assist potential employers? |
| Value-for-money estimations of ‘value’ of degrees awarded. Details are needed on extent to which graduate careers are monitored. Formal recognition of degrees and diplomas by those professional bodies (the professions) regulating degree-level standards and with reserved titles and exclusive rights to practice (e.g. law, medicine, dentistry, other subjects allied to medicine, accountancy, veterinary medicine, architecture etc.) |

(continued)

**Table 1** (continued)

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| Provision of continuing professional development (CPD) training for the professions |
| Effectiveness of engagement with alumni, alumnae, and former staff |
| Extent and effectiveness of schools-liaison efforts and interaction with national bodies setting and marking examinations relevant to university entry |
| State of the estate – buildings, grounds, utilities, transport network, parking |
| Social events organised |
| Canteen provision. Is there a collegiate environment? |
| Standards of laboratories, lecture theatres, computing and internet access, and library facilities. Equipment acquisition and maintenance policies including priority setting and disposal |
| Creativity, innovation, and entrepreneurship in the learning environment; teaching through projects; computing skills and digital technology applications; demonstrable skills in marketing and business studies |
| Maintenance and expansion of important facilities such as experimental animal houses; engineering centre for research purposes as well as equipment maintenance and repair; collections of documents and literature, museum artefacts, artwork, genebanks and germplasm collections |
| Processes for detecting and dealing promptly with corrupt practices |
| Previous outcomes of QA, visiting group, horizon scanning, SWOT, Delphi and Foresight exercises (internal and external). Extent of feedback and openness with all stakeholders and evidence of developing a culture of quality |
| Strategies for institutional improvement (quality, efficiency, and competitiveness) |
| Research output, with bibliometrics and citation metrics. Identification and treatment of key staff |
| Policies and success at acquiring competitively awarded research grants and contracts |
| Progress in the generation of intellectual property and copyright, online coursework, works of art, intangible assets, and synergies |
| Arrangements for supervision of research programmes and operation of a formal laboratory-notebook or its electronic equivalent, and other record-keeping system in the arts, humanities, and social sciences |
| Establishment and operation of linked business-incubator facilities, science parks, and spinout companies. Details of policies to protect and exploit intellectual property developed and used in these facilities. Efforts to seek venture capital and other investments for start-up companies. Membership of science-park associations. QA measures when establishing links with private businesses and multinational companies to safeguard intellectual property and other assets |
| Interactions with industry and civil society nationally and internationally |
| Membership of major academic societies, university networks, and international research consortia. Opportunities available for sharing common QA mechanisms nationally and internationally |
| Awards, invitations to deliver plenary lectures, and other measures of national and international esteem obtained by staff, teams, or the whole university |
| Processes to protect and enhance institutional reputation. Continuous updating of comprehensive, verifiable websites; marketing and publicity efforts |
| Performance in international and national ranking tables and analysis of reasons for position in tables |
| Evidence of productivity and efficiency gains over a set period, say 5 years |
| Areas requiring substantial improvement |

(continued)

**Table 1** (continued)

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| Is the leadership capable of effectively managing change? |
| Does the institution justify the title of "university" according to the generally accepted definition? If not, why not, and what is the board of the institution going to do about this specific aspect? |
| QA and Relevance Reports: key observations and recommendations in priority order |
| Is the institution capable of effective internal QA and relevance assessments? |
| Action Plan, with timescales |

laboratory, and internet facilities; contact time with supervisory staff; stimulation of creativity and innovation such as teaching using project work) should be of sufficient quality to merit classification as a higher-education institution. Nowadays, it is essential that there should be the availability of online coursework with associated performance monitoring of both student and supervisor. Does the institution make its own online coursework? Observations should be made of the quality of the physical estate and recreational facilities. An important feature for some ranking organisations is the degree completion rate. A low figure could mean that the teaching environment is poor, or too many low-ability students were admitted to courses, or the coursework assessment was too rigorous or unreasonable; a high figure could mean that the standards were set too low or there was a particularly talented and competent cohort of students. Are Diploma Supplements [37] issued to accompany the degree certificate to provide a standardised description of the type of study, its level, content, and status according to standards agreed by the European Commission, Council of Europe, and UNESCO? To what extent is the institution involved in national and international projects and consortia? Are there indicators of the reputation of the institution as a whole, as well as of its major sections, and leading members of staff? Is there a reputation-management strategy? Details are needed of the nature of formal and informal links with industry and various sections of civil society and government. Of special interest are detailed assessments of graduate and postgraduate employment and alumni/alumnae interactions. These will indicate the relevance of the teaching and research conducted in the institution as well as value for money, the extent of the graduate premium, and the societal influence of the institution. At this juncture, inadequate resource has been made available by institutions and governments to this critical aspect of higher education and research. Arab governments should make much more use of the universities in their bailiwick as a valuable source of knowledge, advice, and carrying out policy-related research and development, especially in areas of market failure or stimulating new forms of industry, commerce, and social development. In view of the fact that websites are now the first port of call by prospective students, staff, national and international agencies, sponsors, many ranking organisations, and business, the quality, accuracy, and comprehensiveness of the websites used by the institution should be scrutinised. Finally, what areas of activity need to be improved, and is there evidence that the quality characteristics of the institution and its constituent parts are improving? Are measures being taken to combat narcissism, excessive self-regard, and

unjustified superiority over those more practically minded, and are students instilled with a sense of purpose, character, and responsibility?

Formal independent accreditation of universities is now offered by several organisations around the world. Five prominent international networks involved in QA of higher education include (a) European Association for Quality Assurance in Higher Education ENQA [38] whose members operate according to the Standards and Guidelines for QA in the European Higher Education Area, and are listed on the European Quality Assurance Register. Members contribute to the development of the Handbook for Internal Quality Management in Competence-based Higher Education, part of the so-called toolkit developed in the European Union and is claimed to be science-based, flexible, and adaptable, and has evolved in parallel with the Bologna Process [39]. (b) The highly impressive US-based Council for Higher Education Accreditation [CHEA, 40], a non-governmental organisation that comprises 3000 degree-awarding universities and colleges and recognises 60 related accrediting organisations. (c) Another highly regarded QA assessment organisation, the International Network for Quality Assurance Agencies in Higher Education [INQAAHE, 41] is gaining wide acceptance in the Arab region. (d) The Asia-Pacific Quality Network [APQN, 42]. (e) The Cross-Border QA Network was launched at the end of 2016 and at the time of writing is preparing its website. Meanwhile, regional networks have been formed and are being extended, such as the Global Initiative for Quality Assurance Capacity under the auspices of UNESCO and the World Bank [43].

Some types of accreditation are rigorously imposed by governments for teaching and research as a way of sustaining the international reputation of their higher-education sector, such as the oversight system deployed by the former UK Higher Education Funding Council for England (HEFCE) with its thorough and methodical Teaching Excellence Framework [44] and Research Excellence Framework [45]. The HEFCE has recently been merged with the Office for Fair Access and is replaced by the Office for Students [46]. The Office for Students works in close coordination with the Quality Assurance Agency for Higher Education [QAA, 47] that operates as a single entity across the higher-education sector with universities, specialist higher-education institutes, alternative higher-education providers that do not receive government grants, and further-education colleges. The QAA, a founder member of ENQA and member of the Bologna Follow-Up Group, uses a Quality Code [48] with its Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies. It has student engagement and interactions with providers and other interested parties to develop guidance and workshops. Assessments are based on self-assessments according to guidelines, peer reviews, site visits, and published reports. Interestingly, it is subject to its own SWOT, QA, and accountability processes.

Other governments impose QA assessments either as a way to maintain standards in an ever-changing educational environment or as a way to improve their economies. Many QA assessments are voluntary, a recognition of the competitive advantage given by incorporating a culture of quality and self-improvement. Surveying the large number of QA bodies, there is great diversity in methodologies,

specifications, handbooks, rules, procedures, and legal interpretations; there may be opportunities for a pan-Arab QA body. Hitherto, most but not all of these organisations have focused on a relatively narrow and simplistic range of procedures operating mainly at undergraduate-level education. Efforts are now being made to avoid excessive, morale-sapping bureaucracy that can be an obstacle to innovation and creativity as well as impeding the adoption of new systems. Meanwhile, the breadth of QA exercises is being widened. QA of postgraduate education and training is a complex undertaking particularly where research is conducted, and may involve a single research student. The nature and intensity of the supervision, and the extent to which the supervisor is also overseen by others can vary enormously. In our experience, some universities – including prestigious institutions – have launched undergraduate and postgraduate taught-courses without adequate facilities, potential employer engagement, and competent teaching staff. In an effort to maximise fee income, some universities have accepted PhD students without suitable resources to conduct the research and competent supervisory staff. Sometimes, PhD students have also been appointed without proper assessment in order to meet fee-income or performance targets or to meet the requirements of a research grant. No wonder many of these PhD students can only succeed because they are part of a large team and act as technicians rather than as independent academics. The phenomenon of degree devaluation (see Sect. 1 Introduction) now applies to PhD degrees; potential employers often seek additional qualifications and experience such as a series of post-doctoral positions. Unemployment and underemployment stalk the ranks of PhD holders in many disciplines. In accepting the responsibilities of teaching and supervision, staff training in a range of competencies is of paramount importance over and above demonstrable knowledge in their claimed sphere of expertise. Surely the learned academic societies could and should accept much greater involvement in setting standards of supervision and involve postgraduate students in society activities. Efficient QA assessments of staff and student appointments, coursework, and research projects, in addition to potential and actual business partners and sponsors with the university have yet to be properly devised.

Conceptually underpinning modern QA processes is the work of the Swiss-based International Organisation for Standardization (ISO) founded in 1947 [49]. Carefully designed administrative and procedural activities operating in an environment focused on quality will ensure that products and services will fulfil goals, targets, and expectations of both the producer and the recipient of those products and services. ISO develops and publishes international standards in areas such as social responsibility, sustainable development, food safety, energy and renewables etc. and to date nearly 22,000 international standards have been developed. Although universities and other forms of higher education in their entirety have not been a specific subject of ISO scrutiny, some aspects of education and the commercial arms of universities and research institutes have adopted parts of the ISO series, especially ISO 9001 and its derivatives for quality management [50], ISO 21001 (managerial systems for educational organizations), and ISO 29990 (learning services outside formal education such as in-company education). In order to gain accreditation, applicant bodies need to contact an external accredited certification body. If

successful in achieving the standard, the organisation will be subject to routine appraisal and can display the ISO logo. Holders of the ISO standards are committed to self-improvement.

It is important to stress that universities should not and cannot be expected to cover virtually all subjects. Specialisation is inevitable and institutions should be able to offer "unique selling propositions" for their specific areas of expertise in both teaching and research. The days of a single teacher/lecturer/professor covering an entire topic are coming to an end. In most but not all subjects, advancement in scholarship is best achieved using multidisciplinary teams with a critical mass of various forms of expertise reflecting the fact that it is necessary to assimilate massive amounts of information from diverse sources, carry out proper investigations, analyses, and/or experimentation and then generate new contributions to knowledge and understanding. Too few Arab universities have deliberately appointed teams to conduct advanced research in themes that are relevant to the university and the hinterland to be served. To be effective, teams need high-quality leadership.

## 6 Visiting Groups or Teams

Also referred to as assessment groups and external peer reviews, the concept of using independent peers to carry out on-site interviews and assess organisations is long established. Indeed, sponsors such as research councils, international agencies, industry, charities, benefactors, and governments can impose independent QA assessments of various kinds. Moreover, these assessments are often applied to national research institutes operating in or at the margins of the public sector in order to ensure that the research they produce has both scientific validity and various degrees of market or policy relevance. Although visiting groups of various constructs are used to judge the efficiency, effectiveness, and quality of whole institutions and their constituent parts, most notably science- and technology-based universities and research institutes, their reports are rarely published. The quality of a visiting-group or -team exercise is dependent on seven features: (a) a well-prepared membership of senior demonstrably competent and authoritative personnel lacking conflicts of interest with the institution being reviewed, and with a high-quality leader of international repute. (b) An experienced secretariat that takes comprehensive notes and ensures the exercise is thorough. (c) Comprehensive and audited documentation should be prepared by the host organisation well in advance of the visit, but the organisation should be able to provide information requested at short notice, emphasising the need for an efficient information system. (d) The visit must be of sufficient duration to include interviews of senior staff and active researchers and adequate time for the group to discuss their findings and observations. It should also be adaptable to incorporate or supplement QA assessments. (e) Final discussions should be held with the senior management team and governing body or board to deliver main impressions gained during the visit and to receive assurance that the recommendations of the visitors will be enacted unless there is good reason to do

otherwise. (f) The group's final report is then prepared with a set of observations and recommendations. (g) An essential new feature is that a retrospective analysis should be carried out after a period of 2–3 years to gauge the effectiveness of the visiting-group report on raising the standards of the institution generally or specifically of one or more of its component parts. This also means that the effectiveness of the visiting group and its individual members can be assessed. Rarely are all seven features adhered to, and there are too many examples of below-par visiting-group exercises. All visiting-group reports can feed into more formal QA processes. Ad-hoc visiting groups have limited utility unless they are used as a preparatory mechanism to aid in preparing for a proper QA process, or to address areas of concern.

## 7 Relevance

Judging relevance in academia is complicated because much lies in the eye of the beholder. Relevance needs to be qualified: relevant to whom or to what? What might be relevant in peacetime may be irrelevant during social unrest and conflict. Teaching and supervision that are accurate and up to date with the latest known facts can be considered relevant by some, but may not be relevant to either the real needs of the student or to society. Do the education and research activities meet the priorities of the department or team, institution, the sponsor, the locality, nation, region, or humanity? Does the education have future-proofing attributes, i.e. be based on the promotion of a culture of creativity, innovation, and adaptable for entrepreneurial development, and include training in competencies and skills needed to function in modern societies? Have the curricula and research programmes come to terms with the ever-expanding numbers of rapidly developing transformative technologies (Table 2) that are the foundation of the World Economic Forum's Fourth Industrial Revolution (28) and are leading to a fundamental reshaping of traditional academic disciplines and the need for lifelong learning? The pace of change is such that undergraduate and postgraduate courses are expected to have dynamic adjustments and thus course descriptions must allow for updating. Universities also need to bear in mind that in the knowledge-economy marketplace employee skills may only remain economically relevant for less than 5 years. Constant "upskilling" is becoming an expectation, especially for advanced digital competencies (e.g. AI, analytics, cloud computing, coding, machine learning, cyber-security etc.). Universities should offer low-cost training as well as postgraduate courses for employers. This will mean that the interdigitation between universities and employers will need to improve markedly, and special attention will need to be given on staff recruitment and retention. Such issues ought to be examined in QA and relevance assessments.

Examining relevance helps assess whether a curriculum is worthwhile in leading its students to an improvement in lifestyle and instilling a lifelong love of learning and quest for knowledge. In truth, excellence no matter how narrow in scope has value in various ways to the advancement of scholarship. Unfortunately, relevance

**Table 2** Examples of rapidly developing innovative and transformative technologies

| |
|---|
| Nearly all technologies influence and advance all academic disciplines including the arts and humanities, as well as modifying and even transforming national and regional economies and societies. Many technologies interact with other technologies and are cross-disciplinary, and underpin most entrepreneurial initiatives. Many provide regulatory challenges to governments, civil society, trade bodies, educational and research bodies, and the legal profession. |
| **Agriculture, horticulture, food, forestry, and environment** |
| Precision agriculture |
| Water-efficient and erosion-resistant agronomy |
| Drone mapping, remote sensing, and interactions with ground equipment |
| Accelerated breeding with high-throughput genotyping and phenotyping (phenomics) of improved food- and fibre-crop cultivars, livestock breeds, and trees. Temperature- and drought-tolerant crops and crops able to grow in high-salinity soils. Crops designed for uniform maturation and mechanical harvesting |
| Mixed cultivar and mixed species sowing to reduce pest-and-disease resistance pressures and increase biodiversity in current monoculture crops |
| Novel crop and livestock species for food and non-food uses |
| Small-scale and mass production of synthetic (designer) foods, including cultured meat and fish products as well as meat, dairy, and fish substitutes |
| 3-D printing of foods |
| Private- and public-sector genebank and germplasm-collection technologies (removal of pests and diseases; complete genomic, proteomic, and phenotyping data; stable and monitored storage conditions; rapid multiplication, distribution) |
| Soil improvement technologies (low-till and no-till systems; inorganic and microbial composition adjustments; structure improvement; strength improvement; organic matter enhancement; freedom from pests, diseases and weeds; drainage improvement; water retention modification etc.) and effects on crops |
| Soil-free crop cultivation |
| Protected cropping systems to diminish biotic and abiotic stresses (e.g. polytunnels with specific light transmission characteristics to modify growth and development and prevent insect attacks) |
| Multi-storey/vertical crop cultivation indoors using LED and other types of lighting (photonics) of variable spectral compositions, radiant flux densities, and photoperiods |
| Decision-support systems and predictive modelling for water-use and nutrient-use efficiencies, pests, diseases, weed control, and yield and wastage data |
| New generation agrochemicals with minimal non-target environmental effects and without affecting flavour and nutritional value. There is a constant challenge for replacement active products to address tolerance and resistance to existing agrochemicals |
| Automation for ground preparation, planting, protection, harvesting, storage, and processing crops and trees. Automation for livestock handling, growth monitoring, and welfare |
| Specialist robotic planting, maintenance, and harvesting of labour-intensive species (e.g. soft fruit, asparagus etc.) |
| Rapid disease-free mass propagation of decorative and amenity species, trees, and shrubs |
| Recyclable as well as biodegradable food wrappings with atmospheric composition control and absorptive qualities to impede microbial degradation |
| Pre-gut and post-gut food-waste management technologies to extract nutrients, valuable compounds, energy, and fibre, and to remove odorous gases, pharmaceutical metabolites, heavy metals etc. |

(continued)

**Table 2** (continued)

| |
|---|
| Clean-up technologies in urban and factory environments, including bioremediation, waste exploitation for energy and recovery of metals, atmospheric scrubbing to remove pollutants and greenhouse gases, treatments with stable enzymes, and binding agents. Aggregation of nuclear waste and contamination in vegetation for harvesting and concentration. Deactivation of nuclear waste and reuse. Sterilisation and destruction of pathogens. Advanced oxidation sewage treatments to destroy excreted pharmaceuticals |
| Factory-grown leather |
| Habitat reconstruction/restitution – requires access to germplasm collections and gene banks of native species |
| Construction of ecological dispersal corridors and refugia |
| Monitoring of geneflow in flora and fauna |
| Synthetic biology – artificial biological systems to produce non-food compounds and products normally obtained from agricultural, forestry, and from the natural flora and fauna |
| Quantum biology – quantum coherence, tunnelling, and entanglement |
| Enhancement of photosynthetic efficiency, principally the primary processes |
| Perennial cereals |
| Cloning of livestock and endangered species |
| Regeneration of extinct cultivars, strains, and species |
| Biofortification of staple foods (focused, targeted, and mass) |
| Cold plasma and other forms of non-thermal methods of food decontamination |
| Development of balanced livestock diets from competitively priced microbially based synthetic amino acids and fatty acids in order to reduce dependence on imports |
| New forms of cross-laminated structural timbers |
| Nanocellulose and cellulosic fabrics, coatings, and adhesives. Wood-based substitutes for plastics |
| Biosecurity and biosafety technologies to control emerging pathogens, and foreign and invasive species |
| Open ocean fish farming |
| Selective breeding of corals to address their tolerance to ocean acidification and warming |
| Development of blockchain technology with timestamps and verifiable transaction data in open distributed ledgers operated by peer-to-peer groups with agreed protocols to ensure food provenance, traceability, and verification of quality and hygiene ratings. |
| **Molecular genetics and bioinformatics** |
| Rapid and accurate genome sequencing, and roles in parental and desirable gene selection, protection of intellectual property, monitoring gene flow etc. |
| Gene and base editing, including use of artificial bases. Modification of evolution of life forms. |
| New life forms. Bio/DNA foundries |
| Epigenetics; intergenerational epigenesis |
| Reverse and forward genetics |
| Modification of organismal morphology, anatomy, chemical composition, and physiology for biotechnological, environmental, and medical projects |
| Bioinformatics and computational biology; multi-omics data integration and analysis; chemoinformatics; systems biology |

(continued)

**Table 2** (continued)

| **Artificial intelligence** |
|---|
| Medical diagnostics, surgery, and healthcare, including management of complex diseases and conditions |
| AI for new molecule discovery – "robochemistry" |
| Crop, livestock, and tree decision-support systems for growth, reproduction, abiotic and biotic stress management, and breed and cultivar selection |
| Voice and image recognition and understanding |
| Legal documentation production and processing for different jurisdictions |
| Prediction of judicial and arbitration decisions |
| Spam and malware detection and prevention |
| Knowledge acquisition, knowledge engineering, and knowledge representation |
| Automated planning and scheduling; supply-chain management |
| Simulation of conflicts and warfare |
| Financial-management and asset-trading systems, book-keeping, and market monitoring. Fintech (financial technology) applications for automatic banking, insurance, trading, risk management, and cryptocurrencies |
| Video-game technologies for education and training roles |
| Machine learning and perception; autonomous databases |
| Algorithm development/training for greater sophistication, and removal of bias and unintended consequences |
| Affective computing (social intelligence) |
| Computational creativity |
| Artificial general intelligence, machine consciousness, and superintelligence |
| Risk assessments and regulation of AI (automation, unemployment, devaluation of humanity, military conflicts, avoidance of the technological singularity etc.). Prevention of malicious use of AI (manipulation of public opinion, damaging operation of public and company utilities – water, electricity, gas and other fuels, telecommunications, banking and financial management, hacking, acts of terror, fraud etc.). Data hygiene processes and protection of privacy infrastructure |
| **Advanced manufacturing, construction, and engineering** |
| 3-D printing, additive manufacturing, 3-D bioprinting, magnetically assisted slip casting, organ-on-a-chip, medical implants and devices, rapid prototyping, spacecraft and bridge technologies |
| Advanced automation for dangerous and/or repetitive production |
| Computer-assisted (computer-aided) design, including 4-D, 5-D, and 6-D Building Information Modelling (BIM) |
| Biotechnologically derived materials replacing materials derived from environmentally damaging mining, and replacing non-biodegradable plastics |
| Renewable-energy generation and storage systems (wind, wave, tide, geothermal, solar, heat-sink, gravity-based, battery, synthetic fuels etc.) |
| Electric battery technology |
| Graphene coatings |
| Kangome metals |
| Recycling of the 17 rare earth metals (15 lanthanides, scandium, and yttrium) and cobalt, and development of alternatives |
| Recovery and recycling of other metals, minerals, and plastics |

(continued)

**Table 2** (continued)

| |
|---|
| Robot tailors |
| Geoengineering |
| Small and micro nuclear-power generators |
| Virtual- and augmented-reality systems |
| Automated autonomous mass-transport systems |
| Aircraft, vehicle, and boat propulsion systems |
| Environmental sensors (gravity, magnetic force, solar radiation, earthquake, volcano, tsunami, tide, wave, wind, temperature, gaseous composition, chemical composition, water, ionising radiation, spectral composition, movements, sound, contaminants, photosynthesis, heterotrophic living organisms etc.) |
| Tunnelling and tunnel-lining machines |
| Rapid-build roadway systems; automated road-repair systems |
| New bridge systems |
| Water-purification systems |
| River-catchment and flood-prevention engineering to address rising sea levels and building on flood plains |
| Rapid-build energy-efficient domestic housing units with earthquake and unstable-ground resilience |
| DC regional electricity grids; minigrids for locally produced electricity; interconnected supergrids |
| Robotics – construction, programming and use initially to replace humans in repetitive and/or dangerous functions. More sophisticated functions associated with machine learning and more advanced AI. Robots for use in all industries, medicine and healthcare, the domestic environment, and defence. Engineering cybernetics |
| Miniaturised gas chromatography – mass spectrometers and nuclear magnetic resonance spectroscopy instruments |
| Super-bright X-ray lasers |
| Ocean floor mining |
| Non-thermal plasma for catalysis |
| **Nanotechnology** |
| Nano is a functional prefix for industries, activities, disciplines, and products including catalyst substitutes, electronics, foods, ionics, machines, materials, medicine, lithography, robotics, toxicology, tribology etc. where matter is manipulated at the atomic, molecular, and supramolecular levels |
| Development of the mechanical, electrical, thermal, and optical properties of carbon nanotubes and their roles in nanotechnology engineering |
| Bionanotechnology, tissue engineering, nucleic-acid nanotechnology |
| Molecular and supramolecular self-assembly |
| Quantum dots |
| Technological developments for risk assessments and regulation of nanotechnology |
| **Human and veterinary medicine** |
| See other sections |
| AI and near-AI in diagnostics and decision-making (prognosis and treatment) |
| Digital therapeutic health apps for smartphones (digiceuticals) |
| Radiosurgery and robotic surgery |

(continued)

**Table 2** (continued)

| |
|---|
| 3-D printing for medical and dental implants |
| Medical imaging including variants of magnetic resonance imaging, positron emission tomography, ultrasonograpy, elastography, photoacoutic imaging etc. |
| Non-thermal atmospheric-pressure plasma medicine and dentistry |
| Proteins involved in memory processes; neuronal engrams |
| Brain-computer interface technologies |
| Wearable magnetoencephalography scanners |
| Mind mapping, automated brain testing, and neural engineering and implants |
| Cybernetics and computational neuroscience. Cortical computing algorithms |
| Multispectral analysis of tissue morphology |
| Pharmacokinetic and pharmacodynamics methods of severe pain control. Ultrasound-triggered local anaesthesia. Sphenopalatine-ganglion signal blockers |
| Transdermal biosensors |
| Stem-cell-based tissue engineering and replacement organs and joints |
| Induced pluripotent stem cells for regenerative medicine |
| Gut microbiome engineering |
| Gene therapy |
| Telomere engineering |
| Obesity control measures |
| Nanobots (miniature programmable biomachines) to treat blood infections and tumours |
| ‘Ninja’ polymers (synthetic polymers used to kill multidrug-resistant bacteria) |
| New-generation vaccines including anti-opioid vaccines |
| Multi-specific antibodies and antibiotic mixtures |
| Activation immunotherapies and stimulation of immune effector cells |
| Pharmacogenomics and combinatorial chemistry for pharmaceuticals |
| Psychopharmacology |
| Early detection, treatment, and prevention of infectious and parasitic diseases |
| Tooth restoration and regeneration. Tooth implantation with digital alignment and bone restoration |
| Complement cascade immune-system strategies and retinal replacement patches for age-related macular degeneration |
| **Physics, computing, and telecommunications** |
| Particle accelerators and quantum mechanics |
| Quantum computing with programmable quantum processors and reduction in machine error rates and improvement in qubit quality. Superpositioning. Quantum coherence, tunnelling, and qubit entanglement. Hybrid photon-atom (“polariton”) generation. Majorana fermions |
| Higgs boson particle production facilities |
| Atomic force microscopy |
| Data-storage systems; DNA-code-based data storage |
| Big Data and predictive analytics; operation and ownership |
| New programming languages |
| Computer software engineering and cryptography |
| Renewable space rockets and new space propulsion systems |
| Nano and small satellites. Satellite interferometry and deformation mapping |

(continued)

**Table 2** (continued)

| |
|---|
| Satellite prospecting and mapping of managed and natural vegetation and minerals on earth, and extra-terrestrial minerals |
| Astrophysics and astrobiology; exoplanet missions |
| Development of 5G technology |
| Counter-measures for (a) abuse of the democratisation of information via the internet; (b) invasion of privacy; (c) guerrilla drones; (d) cyber-attacks; (e) disinformation |

as a separately identified issue is rarely central to many present-day QA assessments, but irrelevant research is a waste of resources, not least if it lacks reproducibility or is carried out badly, and irrelevant teaching is a waste of young lives. Relevance is not the exclusive domain of science and technology. For example, the Arab region is noted for its history and geography, for its archaeology and development of societies and religions that have shaped and fascinate all modern societies. The diversity of subjects and themes in the arts and humanities are integral to understanding human existence and the functioning of societies. They also underpin the creative industries.

Retrospective analysis of the relevance of a curriculum can be based on surveys conducted at various intervals after graduation. Indicators of relevance can include (inter alia) job destination and its relationship to the degree course, earnings, job security, contributions to society (patents, copyright, evidence of creativity, roles on civil society etc.), and evidence of the continuing pursuit of knowledge. Analysis of employment data must make due allowance for graduates to have the opportunity to realise their potential. High-quality and societally relevant curricula do not mean that graduates will achieve their career ambitions compared with graduates from institutions delivering poorer-quality and less-relevant coursework. For example, graduates from the select group of elite universities are able to capitalise on their more influential network of contacts. This raises the question as to whether their students are buying an education or a certificate from a well-respected university. Employers can assume, sometimes unjustifiably, that these graduates possess high-level competences. There is the undeniable fact that for certain types of employment the "old boy" network ("it's not what you know, it's who you know") persists and can only be made equitable by employers having an open competitive appointment process. High levels of graduate unemployment and underemployment are stark manifestations of the mismatch between market needs and the attitudes and competencies of the education system, as well as governmental incompetence. Universities have a responsibility to monitor the societal relevance and effectiveness of the education (learning environment) they provide. This means following the career progressions of their alumni and alumnae; at present, it seems that most universities are more interested maintaining contact with their former students in order to seek funding. Retrospective opinions of graduates and postgraduates on the value of coursework and supervision received can be enlightening. Continued engagement with graduates and postgraduates opens up opportunities to develop lifelong learning, establish businesses, and share in success. Around the world, universities do not

fully utilise their laboratories, workshops, gymnasia, computing resources, 3-D printing etc., all of which could be made available to alumni and alumnae and charging a fee to cover costs.

A distinct area of societal relevance provided by many universities is their involvement with certain professions, and the roles these professions have in the setting of standards of teaching and research. Of the professions most closely aligned with universities (e.g. law, medicine, veterinary medicine, dentistry and other subjects allied to medicine, civil engineering, accountancy, architecture, etc.), all are meant to operate as members of non-profit self-regulating professional bodies (or institutes, associations, societies, etc.) that demand graduate-level and related qualifications and enforce a code of ethics. Teaching professionals and teacher training have a different and much closer alignment with universities. Some professions (including teachers in some countries) have a licensing system and may be subject to statutory regulation and may have regulatory functions, yet all retain a high degree of autonomy essentially to protect the classic two-party professional-client relationship. Some professions have the status of a learned society and publish professional and specialist journals. All are involved in the development and quality of professional teaching and research and are committed to updating training and skills through continuing professional development (CPD) programmes. Many of these bodies have reserved titles and exclusive rights to operate in designated jurisdictions, and some have transnational recognition. QA and relevance assessments should take into account the nature of the linkage between the university and relevant professional bodies. Are academic disciplines that share titles with professional bodies recognised by or relate in any way to those bodies? It is important that students are not misled by implications of relevance or influence in the curricula they follow. Peripheral to this review but with much wider economic connotations is judging when the regulations imposed by professional bodies start to be a restraint on trade by restricting the number of jobs available and putting up other barriers to new entrants and competing activities from new technologies. Even in academic settings, some professionals develop an unjustified sense of entitlement and self-worth assumed to justify superior emoluments and status. The option of partial or complete deregulation by governments should always be under consideration to curtail the formation of cartels, and professional bodies should therefore ensure that the quality of their services and their value for money are maintained or enhanced.

Yet another aspect of relevance is the role of advisory committees in designing courses and curricula. Too few universities use external advisors from industry and civil society to gauge the utility of a new or existing course. Many courses seem to be established somewhat whimsically in that they reflect the opinion of one or a few dominant personalities, and often employ fashionable terms such as “environment” or “sustainable”.

Pedagogy and andragogy are expected to have a higher profile in nearly all universities claiming societal relevance, except for those universities that are exclusively research-focused and might instead be regarded as specialist research institutes. The theory and practice of teaching are changing dramatically in the light

of digital and other technologies. More research is needed for evidence-informed practice including the assessment of learning outcomes, impacts of game-based and flipped learning, the effectiveness of continued professional development, and lifelong learning. Worldwide, there is a growing demand for well-educated and competent teachers to cover existing disciplines but also able to adapt and teach topics needed for the modern knowledge-based economy. Teacher training is beginning to receive the attention it deserves; university-based teacher training should set the benchmarks for quality and relevance only if it links closely with meeting societal needs. Thus the training courses deserve close scrutiny as to their effectiveness.

## *7.1 Relevance and Responsible Science*

With regard to science specifically as well as to other areas of academic practice more generally, relevance relates closely to responsibility. Responsible science is usually defined as a comprehensive consideration of the totality of factors that influence the integrity of the scientific research process [51]. Nevertheless, responsible science may be best defined in terms of being the opposite of irresponsible science; hence discussions of the topic place special emphasis on preventing and dealing with various forms of misconduct. Thus, irresponsible science could be work that is falsified; inaccurate; a product of plagiarism; fabricated or manipulated no matter how slightly; wasteful of resources; work that directly or indirectly endangers the lives of third parties; the release of unwanted environmentally modifying organisms without proper monitoring and control measures; misleading those who are being supervised; failure to include a proper array of controls; research that lacks proper replication and statistical analysis; work that fails deliberately or by neglect to describe materials and methods thereby hindering the work of others trying to replicate the work; work carried out but not eventually published, or put in the public arena, or patented. Ancillary unacceptable activities include theft, vandalism, sexual harassment, and adversely affecting the work of colleagues. Clearly, integrity, morality, and ethics come to the fore. Integrity in this context refers to the quality of being honest and founded on strong moral principles [52]. Morality refers to the principles underpinning the distinction between right and wrong, and good and bad behaviour [53]. It relates to intentions, decisions, actions, and responsibilities giving rise to the well-known law of reciprocity and maxim of altruism, namely the Golden Rule: “treat others as one would like to be treated” [54]. Ethics, also known as moral philosophy whereby the concepts of right and wrong are defined, recommended, and systemised; moral principles are those that governs a person’s (in this case, a scientist’s) behaviour or the conduct of an activity, such as an experiment [55]. Nonetheless, the zealous pursuit of “morality” as perceived from extremist narrow religious perspectives is dangerous and leads to intolerance and abuse of human rights. Morals and ethics overlap, and change with time in all societies with differing perspectives of what would be classified as moral or ethical, presumably as a result of accumulating knowledge, prevailing styles of behaviour, and the role

of technologies [56–58]. When publishing, the experimental design, methods, materials, references consulted, and results must be presented accurately in sufficient detail to permit others to repeat the work. With the introduction of sophisticated photo-editing software, it is incumbent on authors, their managers, and publishers to ensure that all images are accurate representations; no features should be added or removed, and any adjustments declared (such as "before" and "after" images). Besides the reliability and reproducibility of the science, there must also be transparency, disclosing financial support, and interactions with the manufacturers of scientific instruments and chemicals.

Responsibility needs to be formally accepted at the levels of the individual, the supervisor, and institution, in both the public and private sectors. Nowadays, it is advisable to establish formal training programmes for all scientists, those responsible for them, and for sponsors. Indeed, awareness of responsible science should start when science is taught in schools. Responsible science would prioritise the use of precious resources to focus on training, research, and development that are designed to provide maximum positive impact on wealth creations and the quality of life in society as a whole. This means that the work would be relevant to the needs of society in the short, medium, and long term. Universities should encourage selected areas of citizen science [59, 60], so that members of the public can carry out environmental and health monitoring, supplementing the work of government agencies and research teams, as well as astronomical and weather observations, and investigating new forms of manufacturing. More caution is needed when interacting with groups or individuals attempting biohacking ("DIY biology") in which hobbyists experiment with DNA and synthetic biology outside conventional laboratory environments [61], and may even experiment on themselves; new and powerful gene-editing technologies can be readily acquired, opening up the possibility of unauthorised medical treatments or even bioterrorism. In this instance, universities should offer advice and provide regulation, interacting if necessary with law-enforcement agencies. Most other areas of citizen science such as physics, chemistry, computing etc. will need to be guided by universities.

The quality of supervision and management is paramount. Supervisors must have the capability of encouraging and recognising invention, innovation, skilled know-how, and entrepreneurial characteristics; they must also be able to detect and deal with different types of misbehaviour. Supervisors of research students and post-doctoral fellows require oversight and monitoring; such an important role with its responsibilities should not be the fiefdom of a single individual. Managers and management teams must also know how to protect inventions and encourage their exploitation for the public good or to generate profit to support more academic endeavour. They should also ensure that supervisors do not exploit their students and fellows. Unless there are good reasons for secrecy (e.g. applying for patents or copyright), an open, transparent mode of operation is best for academic progress, and it reinforces social responsibility.

Preventing the stealing of ideas, and sometimes data, will always be a problem, especially in competitive environments. That is why detailed (laboratory) notebooks or their electronic equivalents, properly dated and independently countersigned,

should contain ideas, concepts, proposals, and ancillary observations, and thereby confirm date priority.

Supervisors and management have the crucial responsibility to deal with bad behaviour and corruption promptly and openly. The condoning of corruption, either deliberately or by neglect, is unforgivable in any academic environment. All allegations should be investigated forthwith by a properly designated disciplinary committee with clear channels of communication, proper reporting of the specific details of the allegation, special protection for whistle-blowers and for committee members, and assurance of fair treatment. Investigations must not be influenced by powerful external bodies or internal senior staff attempting to distort pursuit of the truth, and investigations must not be forcibly terminated prematurely by management diktat. If such influences or distortions take place, then they should be put in the public arena.

Areas that need special attention from institutional leaders and from external assessors include (a) the existence, powers, and procedures of disciplinary committees; (b) reward systems to operate fairly across the institution; (c) the nature of the balance between flexibility and rigidity of workplace rules so as to encourage innovation and creativity, whilst recognising that a culture of innovation, creativity, and entrepreneurship must not be at the expense of corrupt behaviour; (d) formation of ethics/integrity committees for teaching and research operating at the level of the institution, faculty, or department; and (e) regulations on the duration of office of committee members as well as on the life span of committees.

## *7.2 Relevance and Responsible Arts, Humanities, and Social Science*

Definitions of the arts, humanities, and social sciences vary, often overlap, can be controversial, and can be somewhat arbitrary. In this chapter, based on our academic experiences, we regard the arts to reflect the theory and physical expressions of human creative skills and imagination, usually involving the visual and auditory senses but also the other senses, too. They are integral to every university. Art tends to be judged and influenced by opinion, current fashion, and taste, and can be controversial. It is the product of various types of talent, and encompasses narrative accounts, mime, and can be regarded as the conveyance of emotion and other feelings. Art subjects include painting, drawing, ceramics, photography, sculpture, conceptual art, aspects of architecture, music, dance, theatre and acting, circus, radio, television, film and cinematography, interactive media, artist-driven and aesthetic aspects of design (e.g. fashion, textiles, graphics), comics, etc. As an academic discipline, the humanities can include the arts and seeks to understand and analyse human experiences, societies, and cultures. Research methods include case studies, constructivist grounded theory, critical discourse analysis, ethnographic research, focus groups, autobiography, media analysis, general qualitative research, surveys,

comparative research of the type used extensively in the social sciences, etc. Subjects include modern and ancient languages; linguistics; literature; history, traditions, and the classics; jurisprudence (theoretical study of law); philosophy including aesthetics; ethics; archaeology; comparative religions and other belief systems; criticism and theory of the arts; many aspects of education; studies and applications of the humanities to the human environment, human geography; politics; cultural subjects; citizenship etc. The social sciences are concerned with humans in their social relationships, social constructs, and experiences, and are generally regarded to have a less subjective approach than the humanities. Although rarely engaged in quantitative research and experimental testing of hypotheses, they are invaluable for providing information for generating hypotheses and gaining wider understanding of the world. Subjects studied under the general heading of social sciences include economics, anthropology, political science, psychology, sociology, demography, management, business studies, law, international relations, administration etc. The remarkable development of transformative technologies (Table 2) is further blurring the distinctions between the arts, humanities, and social sciences, and between the subjects traditionally grouped under their headings. In addition, these technologies mean that most of these subjects complement the so-called STEMM (science, technology, engineering, mathematics, medicine) skills.

Although research in sections of the humanities typically employs semiotics [62], hermeneutics [63], and relativist epistemology or relativism [64], as opposed to the objective scientific method [65], the same concepts of responsibility applied to science must be adopted. Mechanisms and processes should be applied to ensure the integrity and quality of the research, and they should be openly described and monitored. In general, there are fewer teams and groups in the arts, humanities, and social sciences compared with the sciences, and thus oversight can be more challenging. In terms of relevance, there is a widespread belief that graduates in the arts, humanities, and social sciences generally find it more difficult to find employment than graduates in other subjects, with the exception of those with high levels of literacy, creativity, and communication skills, and those with specific skills and adaptability.

There is a danger of certain types of teaching, especially but not exclusively in the arts, humanities, and social sciences, that proselytizes an ideology, type of politics, value judgement, opinion, or a particular belief system, rather than provide a comprehensive analytical overview and encourage a combination of healthy scepticism, a pragmatic open-minded approach, a continuing quest for knowledge, and reflection. Such teaching is often associated with utopian opinions, and those that present them are self-regarded as “intellectuals”. Students that hold different ideological, political, or religious opinions from a proselyting teacher, lecturer, or professor could be greatly disadvantaged. Thus, the contents and balance of the curricula should be reviewed in QA and relevance assessments, and take into account staff contact time with students, often seen to be considerably less than that received by students in STEMM subjects. More generally across the entire university, officially recorded staff contact time for students should refer to staff on permanent contracts, not precariously employed non-permanent staff or postgraduate

students and research fellows sometimes used to relieve permanent staff from what some regard erroneously as less-worthy teaching and marking duties. Of particular importance is the need to encourage a cross-fertilisation of ideas and concepts between the arts, humanities, social sciences and the STEMM subjects, a process made easier by the modern array of transformative technologies.

## *7.3 Relevance, Innovation, Creativity, and Entrepreneurship*

Educating and encouraging populations to prepare them for contributing to the knowledge economy involves formulating and implementing strategies to encourage three critically important aspects of modern higher education, namely innovation, creativity, and entrepreneurial behaviour. QA and relevance assessments should therefore incorporate analyses of the extent to which institutions successfully address these three aspects. Of all organisations and institutions, universities should occupy a, if not the, leading role in developing the fast-moving, technologically driven, modern knowledge economy all countries need, and none more than the Arab world. Why is it that so much public money is spent on research and development, as well as general education, but surprisingly little innovation, creativity, and entrepreneurial activity arise from most institutions of higher education around the world? There are examples of successful patents, copyright, and spinout companies arising from some higher-education and research institutions but relatively few in relation to the massive taxpayer commitments in many countries. There is undoubtedly the "dead hand" effect of the less-desirable features of public-sector attitudes that frown on entrepreneurial behaviour and demand absolute conformity with convention and precedence, rather than promote the national economy. These suppressive attitudes, often driven by barely competent at best and seemingly deliberately unhelpful senior civil servants, focus more on process rather than the outcome or products. Moreover, these attitudes can be seen in demanding excessive numbers of disruptive reviews, resources consumed by unnecessary bureaucratic impositions, and applying ill-conceived legislation that severely impedes business formation as well as the employment of young people and the recognition of meritorious contributions. From personal experience, during a 19-year period leading a public-sector research institute in Scotland, one of us (JRH) enjoyed long periods of interacting with outstandingly able, outward-looking senior civil servants, contrasting with a period of around 5 years of pointless and relentless impedances by demonstrably incompetent senior civil servants to innovative research, business creation, inward investment, and institutional operation. Junior civil servants were excellent. The quality of senior civil servants is an underestimated determinant of a nation's economy; their appointment requires proper scrutiny and quality control. They advise governments and implement policy, and in context of this chapter, they interact with universities and research institutes. By and large, the public sector is a poor custodian of STEMM research and its exploitation for the benefit of the taxpayer when civil servants attempt to micro-manage research programmes and

micro-manage interactions with industry. There is also another factor that needs to be considered. Does the drive to publish articles in high-quality international journals, usually needed to gain promotion and grants, quash those aspects of research and development needed to generate patents and valuable know-how? This would appear to be the case in most universities and research institutes.

Innovation and creativity are closely aligned and have numerous definitions. Put simply, innovation is the product of creativity and means the introduction of something new. Innovation can refer to something new or to a change made to an existing idea, product, or field, whereas invention usually refers to new types of musical composition, a falsehood, a discovery, or any product of the imagination [66]. Some regard creativity as less tangible than innovation, such as an idea, theory, or figure of speech, but it extends into innovation with a musical composition, a new painting style or entertainment construct that establish a genre, or other works of art [e.g. 67]. In our opinion and contrary to the opinion of others [e.g. 68], creativity does not have to be useful and/or valuable. The term "innovation" has been applied to new ideas, products, processes, concepts, services, technologies, business models, and reorganisation systems. Such innovations do not always infer an improvement such as an increase in efficiency or more sustainable use of resources. Innovation and creativity can seemingly be spontaneous but normally arises from pre-existing knowledge and from conducting orderly research and development. Brandt and Eagleman [69] posit that creativity involves people refashion things or ideas by bending, breaking, or blending: bending refers to altering existing properties (e.g. artificial heart); breaking refers to assembling something new from existing parts of a whole (e.g. shotgun DNA sequencing); and blending refers to a mixing of multiple sources together in new ways. Ideas can come from diverse sources, especially technicians and students sometimes posing apparently simple questions challenging long-held assumptions. Lazy people can propose easier and quicker ways of doing tasks. People who can take ideas from one area of life or discipline and applying them to another are particularly valuable. According to Wilson [70], creativity is a manifestation of human social development with an evolutionary premium on communication and social intelligence. This emphasises the roles in creativity and innovation of teams (Sect. 5) and groupings of people, and explains why centres of scholarship, towns, and cities are at the forefront of socio-economic growth. Surely, it must be the case that creativity thrives where there is the freedom to make mistakes and where rare or even unique attributes and abilities will be encouraged. An environment is needed that engenders self-confidence and positivity rather than continuous harsh reviews and negativity so often noted in academia where, for example, substantially more time is taken on thinking and disparagingly criticising why an experiment or building a prototype should not be done rather than on carrying it out.

The degree of novelty can vary from the most minor invention or idea that is soon discarded to an entire reshaping of the international economy with wide-ranging political and social consequences. Examples of the latter include developments in financial services, new forms of healthcare, improved crop production, new forms of energy generation, new forms of social communications and interactions – witness

the current dependency of significant proportions of the global population on smartphones, etc. Innovations may have local, national, regional, and global impacts. Some innovations improve bureaucratic and business efficiency, such as improved accountancy systems, ICT for large and constantly amended data sets, robotics, 3-D printing, nanotechnology, biotechnology-derived materials and processes, etc. New research-based tools based on computing software design, quantum mechanics, big data [71], cloud computing, molecular genetics, etc. have the capabilities to give rise to an explosion of innovations. Many recent innovations integrate different technologies with fashion and behavioural changes, e.g. smartphones and the social media (Facebook, Twitter, Instagram, and other related media and communication systems); their positive and negative effects on democratic processes at a time when fake news is being used for political ends have yet to be fully evaluated. As a consequence, innovation can bring about profound disruption to existing businesses and organisations. Even major companies can go out of business if they cannot create, acquire, adapt to, and exploit innovation. Countries can be impoverished if their wealth-creation model cannot keep up with competing countries, as the Arab world fully realises. In general, innovation empowers the consumer, making life easier and/or more interesting.

In education, the growing impacts of online education, such as Massive Open Online Courses – MOOCS, and digital technologies are revolutionising all levels of teaching as they incorporate AI, Big Data, data analytics, virtual and augmented reality, and complex software tools to gauge the effectiveness of the teaching material, the performance and understanding of the student, and the competence and achievements of the supervisor [72]. This so-called "ed-tech" is challenging traditional teaching methods, and auditing of QA and relevance will need to take account of the growing industry of Online Programme Managers (OPMs) working in conjunction with MOOCS. Nevertheless, detailed studies are needed to examine the extent to which screen time has demonstrable beneficial or harmful effects on learning. Research is needed in teaching methods, materials, and attitudes to improve efficiency and effectiveness. The digital revolution along with other transformative technologies is also dramatically reshaping academic research and development. Legitimate questions arise as to whether universities and related organisations in their current form are capable of managing change and stimulating their staff and students to be innovative. In addition, the appropriate operating academic environment a priori and from observation needs freethinking, free speech, and encouragement to challenge, without retribution, orthodoxy and tradition. QA and relevance assessments should incorporate analyses of innovation and competitiveness.

The biggest impedances to innovation come from various standpoints. Activities and industries likely to be threatened by innovations can be expected to pose legal and other challenges, sometimes to the point of buying out and then closing down competitors. Also, impedances come from adherents to sections of certain religions, some political groupings, and followers of certain traditions, as well as those people in all societies with negative personalities resistant to change (often erroneously attributed to the old). The recent obituary of Calestous Juma is enlightening in this respect [73]. Virtually all new technologies evince resistance, some times for good

reason because virtually all technologies can be used for good or ill. The formulation and implementation of evidence-based policy to regulate the application of technologies are dependent on politicians with their advisors and civil servants having a working knowledge of STEMM subjects. Governments and politicians universally are dominated by people lacking advanced knowledge of STEMM subjects and their applications. Academia should therefore play a major role in investigating the potential impacts of technologies as well as in their creation, and advise governments accordingly. Another major impedance to the introduction of new technologies or refinement of existing ones is the Precautionary Principle [74] when aggressively utilised by those in pressure groups and politics who are variously anti-science, anti-modernity, anti-experimentation, anti-corporations, anti-western, anti-American, and anti-progress. They demonstrate excessive concern about "unintended consequences", ownership of intellectual property, health and safety, and effects on the environment. Their concerns are not assuaged by (a) highly detailed risk assessments; (b) detailed health and environmental monitoring (including containment facilities); (c) legislation that can force the dismantling of monopolies and/or rent-seeking economic behaviour; or even (d) legal systems that harshly punish transgressors. Conversion of an innovation into society can then be unjustly severely impeded or more probable stopped by energy-sapping excessive, time-consuming, and pointless bureaucracy that compounds the difficulties in addressing the usual legal complexities and garnering financial support faced by entrepreneurs. Countries suffering these impedances can be severely disadvantaged in a competitive world. Governments should have policies coupled to customer-friendly administrative and funding structures that offer consumer protection as well as help stimulate innovation. Innovation-related indices include the World Competitiveness Index of the World Economic Forum [75] and the Global Innovation Index [76]. Parenthetically, governments should review the fact that data, mostly accessed freely from consumers and computing users, have now become the vast economic capital and huge competitive advantage of a few Silicon-Valley-based companies and a politically well-connected Chinese company, as they buy out or swamp competitors and create a socio-economic imbalance that needs to be corrected [77]. In academia, deeper analyses are needed of decision-making, belief, and behavioural biases operating in various societies.

Entrepreneurialism in an academic context usually comprises training in the theory and skills needed to be an entrepreneur and start a new business or enterprise [78]. Perhaps undue emphasis is placed on the role of the postgraduate Master of Business Administration (MBA) degree, originally introduced to provide a scientific and more analytical approach to management, as a driver of entrepreneurship. Can entrepreneurship be taught at the undergraduate level? Numerous examples of multi-generational family enterprises would infer that an appropriate environment facilitates entrepreneurial behaviour and risk-taking. A suitable educational environment would provide the skills and awareness of opportunities (not least transnational opportunities), networking, attendance at customised events with venture capitalists and bankers as well as with advanced technologists, knowledge of management accounting, training in negotiating and bargaining, and developing the

confidence to deal with investors. Students would know how to identify opportunity and where to go for advice and funding. The process of being an entrepreneur starts with perceiving a business opportunity and this may be connected with one or more innovations. Entrepreneurs may act as intermediaries but must have a willingness to assume the risk for running the business, demonstrate considerable initiative, and persistence in the face of various and sometimes numerous impedances. In designing, launching, and running a new business, the entrepreneur must have a clear vision, access to legal and accountancy advice, a reliable source of capital, a unique selling proposition, good market contacts, and the skills and capacity to appoint competent staff. A business plan [e.g. 79] is often the starting point for accessing support. Risk aversion [80] is the enemy of entrepreneurialism.

Universities possessing business schools and science parks and business-incubator units have a marked competitive advantage in delivering education in relevance, innovation, creativity, and entrepreneurial behaviour. Teachers of student studying entrepreneurship should have personal experience in launching start-up companies and possess a wide circle of contacts with figures influential in venture-capital, intellectual-property and contract-law, accommodation, and banking communities. All courses should have advisory committees of successful entrepreneurs and business people, as well as intellectual-property and company lawyers, and financiers. Having working examples on the university doorstep of successful start-up businesses generated within the academic environment can be hugely encouraging to both staff and students. Sometimes, the initiating factor comes from students discussing their personal interests. Examples from the major top-rank international universities illustrate the synergistic effects of these businesses on other start-up enterprises. Universities should have technology-transfer arms and determine at the outset the relationship they want with these businesses and their science parks and business-incubator units. Assistance before the proof-of-concept phase may be deemed to be speculative but wisely allocated should give rise to a profitable business. Advice should also be offered on building a brand (brands persist whereas products and processes can be readily duplicated despite expensive apparent patent protection), and using social media for marketing. If the conditions posed by the host university are oppressive then opportunities will be lost and the institution fails the staff and student body. Entrepreneurialism is the primary vehicle for effective and profitable technology and knowledge transfer. Arab universities have a poor record of creating companies, a situation that contrasts with the historical reality of exceptional levels of trading and entrepreneurial activities of Arabs and is a situation that must not be allowed to persist.

Some universities around the world are merely inflexible public-sector institutions with self-serving, worst-kind-of-public-sector attitudes pandering to and controlled by government and with expectations of entitlement of financial support from taxation of the private sector. Many private universities either willingly emulate or are required to adopt the unproductive processes of public-sector bodies. An attitudinal conversion is needed to engender ambition and a commitment to improve the wealth-creating and quality-of-life capacities of the host country without imperilling institutional integrity.

## 8 Bibliometrics and Citation Metrics

Gauging the performance and impact of academics and their institutions often involves bibliometric analyses including citation metrics. Bibliometrics refers to the mathematical and statistical analyses of written publications including books and articles as well as other communication media [81]. Citation metrics [82, 83], a subset of bibliometrics, comprise diverse measurements including Impact Factors produced by Journal Citation Reports (JCR); Immediacy Index; Eigenfactor drawn from the Web of Science; SCImago Journal Rank (SJR) and Source Normalized Impact per Paper (SNIP) drawn from Scopus; CiteScore – one of eight new Scopus indicators; h-index devised by J.E. Hirsch; e-index devised by C-T Zhang; g-index devised by Leo Egghe; contemporary h-index; three variants of the individual h-index; Google Scholar Metrics derived only from journals and limited to papers published in the past 5 years; Data Citation Index (DCI) measures credit given to contributions to data repositories and attributions when the data are used in other work; Altmetrics measure how often work has been read, cited, and discussed giving rise to an "attention score"; so-called "live metrics" for constantly updated citation counts from Web of Science and Scopus together with Altmetric scores; plus numerous other variants used by individuals when presenting their records of achievements. The role of social media is gaining more importance, especially as a marketing tool for journals and research teams. The quantitative data are commonly used in research-assessment exercises along with peer-review opinions. They are widely adopted as proxy measurements for assumed "importance" or "quality" of a publication, and hence also of a research individual, team, or institution.

Caution is required in applying bibliometrics methodology in carrying out QA and relevance assessments (Sect. 9 **Peer Evaluation**). High numbers of citations in a period of a few years do not mean that a publication is of a higher intrinsic quality than one with a lower number, especially in the medium or longer term. There is also a matter of the type of discipline, the degree of technology dependency, and the relative number of people working in a particular field of study; all three aspects should be taken into account. Some data can be difficult to source. Biases can become manifest when referee and citation cartels are established ("I will cite your paper if you cite mine, and we will ignore the work of others"). Perhaps preference should be given to open-access journals. Much modern science involves large teams (consortium science) and it is difficult to distinguish between the relative contributions of individuals to the concept of the work, the experimentation, its interpretation, and writing the manuscript. Authors may be credited despite little or no contribution to the work especially if they are in a position of authority; those providing minimal input should only be recognised in the acknowledgements section of a paper or book. Single-author papers are becoming rare. Once-esteemed national journals from academic societies are giving way to a few international high-ranking journals, even though the numbers of papers that have to be withdrawn have seemingly not diminished. Post-publication corrections, questions about reproducibility,

withdrawal of published papers, and other publishing misdemeanours should be quantified formally and publicised.

Undue emphasis on publications can mean that valuable other educational work can be underestimated or ignored, such as the creation of advanced on-line material using virtual and augmented reality and AI; development of experimental protocols and instrumentation; developing data-analysis methodology used to plan and analyse experiments; production of informative but unpublished papers and review documents circulated within and between institutions; generation and maintenance of important collections including microorganisms, animal houses, germplasm and genebank acquisitions, library materials and museum specimens; conducting demonstrations of advanced technologies; maintaining environmental databases; and, not least, performing important administrative functions underpinning the smooth operation of the institution.

## 9 Peer Evaluation

For scholarly publications, the peer-review process is a well-established form of self-regulation to maintain or raise the standards of quality and credibility [84]. Medical and clinical peer reviews for research reports and clinical practice have wider connotations relating to compliance with the standards set by the main professional bodies [85]. Authors submitting their work to an editor for publication have their manuscripts sent to a team or board of referees deemed to be experts in the relevant field of study, operating with no conflicts of interest. The referees offer critiques meant to be constructive and to ensure the work meets the editorial standards of the journal. Sometimes, the work is rejected as unsuitable. A similar system operates for scholarly books. Reviews can be "single-blind" or anonymous, where the author does not know the identity of the reviewer(s) but there is increasing tendency to declare reviewer names. More rarely, the names of authors are not declared to reviewers so that the system is "double-blind" so as to reduce the possibility of bias caused by conflicts of interest or prejudice. Peer review suffers from many deficiencies [86] including its slowness, expense, inconsistency, bias, and liability to be abused. Improvements include always having double-blind reviewing, opening up the reviewing process to a wider range of reviewers, and training new reviewers. Nonetheless, the system can only function with a significant reliance on trust. Regretfully, trust is threatened by a huge increase in the number of journals of dubious repute that falsely claim to offer peer review, and may even make false claims about membership of editorial teams. This situation may arise partly because some journals no longer offer subscriptions and charge publication fees, reducing their need to have rigorous review processes. Perhaps the removal of reviewer anonymity would make peer review more transparent but there is a natural tendency for anonymity to permit reviewers to be honest and blunt. The message from the foregoing is that assessors of academic staff for appointments or performance must be vigilant in determining the veracity, true worth, and originality of submitted publication

lists. Assistance with this process is undoubtedly aided by the subscription service offered by Cabells Scholarly Analytics [87] with its Whitelist of reputable journals and Blacklist of dubious journals, although the disciplinary categories, calculation methodology, factor weighting, and completeness are being refined.

Another aspect of reviewing papers specifically in STEMM subjects concerns statistical analyses. All STEMM research is dependent on designing experiments and then acquiring, analysing, and interpreting data. Relatively few researchers have ready access to advanced statistical advice and involvement, thus close scrutiny of the statistical aspects of submitted papers is imperative. In some topics, such as enzymology and molecular biology, there are secure repositories of raw data for others to access, but this is not commonplace. Sometimes access is denied when there are intellectual property issues, although these should only lead to a delay in accessing data. As a means of checking data validity, peer reviewers could consider "reverse statistics" with the intention of reconstructing sometimes-complex data sets by scrutinising using algorithms data presented in the form of means, standard errors and deviations, and the numbers of data points.

Members of QA boards or visiting groups (Sect. 6 **Visiting Groups or Teams**) must have the confidence of the institution under review by having a demonstrable and relevant record of achievement at a senior level and no conflicts of interest. The issue of conflicts of interest is complicated because auditors may have pre-conceived opinions as to the worth and quality of an area of study, or have indirect contacts with an institution; early declaration of interests and releasing easily accessible (to the leadership teams) curriculum vitae by the auditors would help. There can be a tendency to select well-known narrowly focused academics regrettably unable or unwilling to consider activities outside their immediate sphere of interest, or are culturally or managerially ignorant of the constraints operating in the organisation. Sometimes, the observations and recommendations in their reports can be wrong and damaging to individuals, the institution, or even the nation if key areas of activity are recommended for closure. Retrospective analyses of the reports and their authors are therefore recommended. A limited element of common membership of these boards assists in spreading best practice and aids in obtaining comparative performance assessments. Groups of higher-education institutions should cooperate in having a common assessment board.

Some of the ranking organisations (Sect. 4 **University Rankings**) seek the views of academic peers to help grade universities by commenting on reputation [88–90]. The concept of reputation can be extended from the conventional definition of representing the opinion that people in general have of something or someone, to having respect or admiration for something such as an organisation or someone based on past behaviour, character, or achievements. Reputation can extend from good to bad, of course. For higher-education institutions, positive respect may equate to offering high-quality education and research, indicative of a body with credibility, prestige, or even fame, reflecting well on its staff, students, and alumni and alumnae. To avoid possible prejudice and conflicts of interest, it is normal for a large group of peer assessors to be consulted.

## 10 Preparing for the Future

Various exercises can be used by academic staff and their management to develop strategies and tactics in order to address deficiencies, acquire inward investments by capitalising on human and other resources, bring about a major change in direction, or deal with threats and competitors. These exercises should be encouraged, and if properly managed, can act as a way to bring about harmonious relationships and dynamism in staff groupings.

### *10.1 Preparing for the Future: Strengths, Weaknesses, Opportunities, and Threats (SWOT) Exercises*

Regular SWOT exercises [91] involving as many members of an institution as possible have considerable merit in engendering staff commitment. These exercises are more than simple surveys. They can be sub-divided into sectorial analyses but an overall institutional assessment is needed. Management can discover internal perceptions of the organisation, its competitiveness, and act to improve any deficiencies. By highlighting the individual SWOT characteristics, evidence is gained in reshaping activities, making investments, or closing down tired unproductive sections, possibly redirecting staff. Most SWOT exercises are conducted internally but should begin to involve external experts that can ask exacting questions, challenge the validity of assumptions, seek evidence for any conclusions, and make suggestions for improvement. QA exercises can check if such analyses are routinely carried out, or even conduct one. SWOT analyses can be supplemented with PEST (Political, Economic, Social, Economic) and related analyses such as STEEP (Socio-cultural, Technological, Economic, Ecological, Political) or STEEPLE (Social, Technological, Economic, Environmental, Political, Legal, Ethical) [92] that integrate political, economic, socio-cultural, technological, legal, environmental and ecological, ethical, demographic and intercultural aspects.

### *10.2 Preparing for the Future: Horizon-Scanning, Trend Impact Analysis, Scenario Method, Delphi and Foresight Exercises*

As with SWOT exercises, regular horizon-scanning exercises [93] offer considerable benefit to keep abreast of state-of-the-art developments and the actions of competing bodies. The members of the horizon-scanning teams need to be open-minded, creative thinkers, and opportunistic. Forecasting the future by considering the potential impact of most technological and societal developments is incredibly difficult and often best left to the market place, but some developments are already

reshaping society and education, such as the introduction of advanced information and communication technology and related technologies. Few higher-education institutions can be at the forefront of developing such technologies but universities must be prepared to adopt them wholeheartedly.

In essence, horizon scanning should be a continuous, organised formal desk-based process closely related to SWOT analyses but usually has resonance beyond a single or even small group of institutions. By exploring technological, commercial, environmental, and societal developments using a wide range of information sources, hitherto unidentified risks and opportunities can be identified. This process aids risk management and informing policy. Qualitative and quantitative information can be assembled in SWOT analyses. No wonder several governments and leading companies use SWOT and horizon-scanning analyses to inform decision-making and help develop strategies and visions. Closely aligned to horizon scanning are (a) the more limited Trend Impact Analysis [90] that extrapolates historical data into the future, and (b) the scenario method [94].

Delphi and Foresight exercises are closely related variants of SWOT, horizon scanning, Trend Impact Analysis, and the scenario method. The Delphi method [91, 95] uses a group or panel of selected experts to answer a series of questions about future developments, with answers required over several iterations. Panels attempting to pass judgement on possible future scenarios ought to incorporate both divergent thinking that encourages creative elaboration of ideas, and convergent thinking that is goal-oriented, analytical, observational, and deductive. At the end of each round, a facilitator summarises the expert forecasts and the panel members are asked to review and possibly revise their earlier answers. The range of answers tends to narrow towards a distillation of consensus views. Group membership should be anonymous, geographically spread, have diverse backgrounds (gender, age, education, discipline, public or private sector), and best conducted online. Much depends on constructing well-thought-out question papers, the quality of the facilitator, and proper design of the exercise to permit robust statistical analyses of the data. Usually, several Delphi panels covering major issues and developments report to a central panel that distils and prioritises the consensus views of the panels. National and regional Foresight exercises [96] integrate the Delphi and other methods with wide public consultations, and bring together public and private sectors to agree on research and development priorities and help create consortia and synergies. They therefore have the capacity to help shape the future. All these exercises and analyses have to factor in uncertainty that is then lessened by introducing relevant new information.

## 11 Institutional Responses to QA and Other Assessments

Few institutions will be able to bask in glory following thorough and comprehensive assessments. Deficiencies, inadequacies, and worrisome features will always be highlighted in parts of any large organisation, and must be expected in dynamic

environments of advanced teaching and research. On the important basis that there is confidence in the rigour, independence, and quality of the assessment with its observations and recommendations, then any necessary remedial actions will need to be taken at the earliest opportunity, especially if there is doubt about the sustainability of the institution. Wide participation and openness in the university will help address essential transformations and soften the impacts of closing down sections or activities, yet give encouragement to areas of work that will benefit from reinforcement, and provide openings for entirely new areas. Oftentimes, remedial actions will be awkward to implement if deficiencies are highlighted in senior management and institutional strategies, testing the integrity and mettle of the entire university. After careful analysis of the assessment, action plans will need to be drawn up with robust timelines for implementation to ensure that the whole exercise was not a wasted opportunity. In some circumstances, bruised personalities will need to be managed; inflated egos can be deflated. Proper independent assessments have the benefit of preventing institutional self-deception and provide a vehicle for transforming and upgrading parts or the whole university. Once the concept of continuing self-improvement, welcoming independent assessments, and willingly being compared with related organisations become commonplace, universities will help transform societies for the better.

## 12 Conclusions

To be effective, all types of QA and relevance assessments require the trust and confidence of the staff and leadership of the organisation, not least because when first adopted there can be considerable extra work in gathering, checking for veracity, and analysing data at the outset. The process has to be more open and transparent than most assessment systems that took place hitherto because staff relationships can become both strained and sometimes over-stimulated when comparative performance data are released for the first time. Simply imposing a QA regime with unreasonable expectations for key performance indicators, benchmarks, and deadlines will lead to institutional failure. Critically, the QA process selected by an institution must be fit for purpose and adaptable to prevailing circumstances, such as occurs in politically unstable times or in cash-strapped organisations, and provide encouragement and ambition. An inflexible and remote box-ticking approach that ignores relevant issues will destroy confidence and impede self-improvement. Too much emphasis is presently being placed on process rather than outcome by most QA organisations but the leading organisations are evolving rapidly. The time has come for an authoritative QA and value-for-money appraisal of these organisations. Entirely new, broad-spectrum, bureaucratically efficient, transnational, and continuous assurance and related systems are needed to encourage a culture of self-improvement to achieve genuinely high-quality education and research. This approach should be coupled to determining measurements of relevance by integrating greater scrutiny of the output of higher-education establishments, namely the

careers and societal impacts of their graduates and postgraduates, in addition to detailing contributions to the advancement of scholarship, and the generation of valuable (monetary and cultural) intellectual property and advanced know-how (tacit knowledge). A summary list of key points to be considered in comprehensive QA and relevance assessments of universities is presented in Table 1. Advanced research institutes should be brought into the ambit of these more sophisticated QA and relevance assessments. In considering the data submitted about an institution, the reviewers must always bear in mind the oft-cited (but of unknown origin) Twyman's Law: if a statistic looks interesting or unusual, it is probably wrong. To this we add that (a) if something is measurable, it does not necessarily mean that it is important; and (b) avoid concentrating too much on the minutiae of processes as long as they have integrity and concentrate on outcomes and impacts. So much depends on the competencies and "nous" (common sense, intellect, expertise, and judgment) of the auditors; they should be selected with extreme care. That then raises the question as to who selects the auditors and who chooses the QA and relevance criteria.

Those creating and implementing higher-education teaching and research policies, and those in leadership positions in universities and in sponsoring bodies could learn a great deal from the approach adopted by agricultural scholars in the USA as they examined factors used in agricultural production. Rates of return to agricultural research and human capital were integrated with research planning, and allocation of research resources. In a seminal publication, Julian Alston, George Norton, and Philip Pardey [97] considered institutional and conceptual frameworks, measuring the effects of agricultural research using econometric measurements and economic surplus methods, evaluation and priority setting in practice, and areas for future model development and application. The sheer success of modern science- and technology-led agricultural production in meeting an expanding global population demonstrates the value of effective policies. Other academic areas would benefit from similar analyses. All countries should have directed national science, technology, and healthcare policies developed in concert with the higher-education sector.

That an institution receives a positive QA and relevance audit does not necessarily indicate a successful future. The quality of strategic plans and proposals are dependent on the quality of leadership of the organisation and its various sections and groupings and how they utilise the available resources whilst managing change. Those academic institutions noted for a rapid turnover of senior staff or those that use an appointment system of "Buggins' turn" rather than merit for leadership positions will continue to underperform.

In addition to dealing with instances of corruption noted in Sect. 3 **Higher-Education Institutions in the Arab Region**, urgent action must be taken to stop the selling of fake degrees and professional qualifications calculated to deceive [98]. In some instances, their issuance is followed by threats and blackmail. Coordinated and concerted efforts to address this problem are required globally by governments, social media, and employers in the public and private sectors. These efforts are dependent on accredited universities maintaining publicly accessible but secure records of their graduates and postgraduates. The Higher Education Degree

Datacheck service offers a centralised system for verification of UK university degrees connecting employers, agencies, universities, embassies, and councils [99]. Recent data-privacy policies in some countries that encourage the destruction of records need to be reconsidered. A related area of concern is the recent trend in offering essay- and project-writing services [100], often associated with subsequent blackmailing of the purchasers. Rigorous examination and supervisory standards should be established to end this form of corruption.

Penultimately, we turn to a wider and more profound issue. Bearing in mind the findings of the 21st Century Skills Framework [25] and the Future of Jobs Report by the World Economic Forum [28] mentioned in Sect. 1 **Introduction**, we do not view with equanimity or pleasure the prospect of a major decline in conventional employment. Universities will have to pay attention to the expectation that most people will have a working life comprising a portfolio of jobs with a succession of employers and with continually updated skills through lifelong learning. Well-qualified professionals with specific marketable skills will readily find employment as self-employed consultants or key employees. Others will have specific skills and expertise in high demand. Of concern is the rapid expansion in many countries of the gig economy of short-term contracts and freelance work, a part of the economy that is mainly the fate of younger people (including graduates) who are offered insecure low-paid jobs with no or minimal healthcare, pension, and holiday benefits. Some are forced to combine a series of part-time jobs. Cyclical, seasonal, frictional, and structural forms of unemployment, and their association with an inability of gig workers to have secure day-to-day or week-to-week incomes, produce an increasing tranche of vulnerable adults facing difficulty in securing accommodation and providing a stable family life. Compounding this undesirable state of affairs is the fact that many jobs are in the process of being automated. Universities must open up new vistas of meaningful and fulfilling employment, and adjust their curricula and research programmes accordingly, i.e. be relevant. Governments, in turn, must legislate both to ensure social safety nets are in place during this phase of employment transition and to make employers act responsibly.

Finally, Arab universities have the potential to overcome the social and economic problems facing the Arab world **only** if they raise the quality and relevance of their teaching and research. Successful performance in comprehensive QA and relevance assessments will yield rich rewards for Arab universities in a competitive global marketplace for education and research. It will impact immediately on Arab societies and address the perilous economic and unstable social conditions they face. The low prosperity of the majority of Arabs is highly correlated with low multi-factor productivity, reflecting the desperate need for improved education and research associated with wide-ranging technological improvements [101]. All Arab nations should have one or more internationally focused research universities. All universities should think and plan positively, and attract students and staff from around the world. In law, the term ‘time is of the essence’ is a contractual provision that requires prompt and timely fulfilment of an obligation under contract [102]. Surely the Arab universities have a form of social contract with the peoples of the region, including their governments, to perform their fundamental roles of teaching and research with

due regard to quality and relevance, and in this instance, time really is pressing. We do not underestimate the enormity of the challenge [15, Table 1 in 103, and Sect. 3 **Higher-Education Institutions in the Arab Region**] but have confidence in the collective capability and goodwill of all the academic communities. The international academic community and the leading learned societies must be proactive in their support for Arab universities to facilitate the economic and social transitions critical for the success of the region. Let us hope that the multinational project Synchrotron-Light for Experimental Science and Applications in the Middle East (SESAME) [104] will act as the progenitor of greater academic collaboration across the entire Middle East and North Africa. All governments, and not only those in the region, seek to improve meaningful employment for those leaving any form of education. They, the universities, and other relevant actors (especially employers) should bear in mind the statement made by C. Northcote Parkinson (1909–1993) to the Swedish Employers' Confederation in 1980: "Aim at prosperity and employment will follow; aim at employment and you will get anything but prosperity" [105].

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# Transnational Education Networks of Excellence Based on Quality, Accreditation, and Recognition Management: A Holistic Approach


**Christian-Andreas Schumann, Feng Xiao, Kevin Reuther, and Claudia Tittmann**

**Abstract** The Triple Helix Model is used for describing innovation processes as a co-operational approach of universities, industry, and government. It is used for the development of knowledge-based relational networks of these three subsystems and influences the subdomain of sustainable education. One prerequisite for the successful application is a common understanding of quality. In a society of highly-developed countries, comprehensive quality consensus and culture is one of the most important success factors. If experience is to be transferred and cooperation is to be developed, the quality systems must be coordinated with one another. This also applies to education. However, due to the cultural peculiarities that influence the understanding of quality, an adjustment makes more sense than a simple adoption.

Education institutions are subject of enormous transformation because of the massive influence of digitalization, diversification, and individualization of learning and training. Their strategic orientation has to be focused on regional, national, as well as international targets today. Typically, many education providers are too small to meet all these challenges on their own. This results in a need for greater integration, continuity, and permeability of the education domains while maintaining and harmonizing high education standards. Therefore, organizational developments

C.-A. Schumann (✉) · C. Tittmann
Faculty of Economic Sciences, Westsächsische Hochschule Zwickau, Zwickau, Germany
e-mail: Christian.Schumann@fh-zwickau.de; Claudia.Tittmann@fh-zwickau.de

F. Xiao
Department of Economics and Finance, Tongji University, Shanghai, China
e-mail: fengxiao@tongji.edu.cn

K. Reuther
Faculty of Economic Sciences, Westsächsische Hochschule Zwickau, Zwickau, Germany

School of Business and Enterprise, University of the West of Scotland, Paisley, Scotland, UK
e-mail: Kevin.Reuther@uws.ac.uk



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_3

are placed in the context of intra-organizational characteristics. The organizations mostly are legally and economically self-sufficient, but join forces in networks to achieve greater size without losing their flexibility. Increasingly, education providers are implementing quality assurance according to ISO 9001 and transferring this approach into their network relations.

Initiated by the Bologna Process, extensive regulations for qualification frameworks and evaluation both at national and international level have been created in Europe. In addition to the corresponding accreditation systems, they serve to improve the control of increasingly complex, high-quality processes.

Opportunities, challenges and risks of digitization, digital ecosystems and disruptive business models for even more innovations in education are also considered in terms of quality assurance and quality improvement in heterogeneous education networks and systems.

**Keywords** Education system · Education network · Triple helix · Knowledge society · Recognition management · Accumulation of competencies · Accreditation · Systemic perspective · Digitalization

## 1 Introduction

Globalization and digitalization foster transformation processes in all areas of society, including education. Individual education providers and educational organizations are increasingly cooperating and joining networks. One of the most advanced forms of such organizations are transnational education networks. If the aim is also to establish education networks of excellence, these processes must be carried out with the highest quality in teaching and research. Such complex organizations must be analyzed, planned, developed, implemented, and operated in a holistic manner. Quality management and quality assurance play a key role, massively supported by recognition management for achievements made at other institutions in higher education, the management of the accumulation and transfer of competencies gathered outside of higher education, as well as accreditations in the context of validations and evaluations. In a holistic system of education, these management approaches must therefore be considered in their mutual interactions and in their relations to other entities of the system.

Starting from a systematic and logistical view of education systems, their role in today's knowledge society is examined in more detail. A particular focus lies on the connection between knowledge-based models and the triple-helix approach. The risks and opportunities of globalization also have an explicit impact on education systems. Under these conditions, the specific organizational form of transnational education networks of excellence thrives and evolves better than un-networked or low-networked education systems. Therefore, quality management should not only be applied to individual educational institutions but should also be qualified for these international education networks, especially in the context of excellence. It should be noted that quality management and quality assurance in general, and for

education and training in particular, are subject to special standardization and standardization efforts. All these standards, regulations, recommendations, etc. must be considered when developing transnational education networks.

Through a holistic approach, a framework is outlined and developed. It provides the basis for the concrete design of quality assurance in connection with recognition and credit management as well as accreditation systems for the evaluation of educational quality in transnational education networks. These processes can only be successfully implemented if all stakeholders are sufficiently involved in the development and their relationships with each other are managed professionally. If all the objects, relations, and processes of the education systems under consideration are systematically developed at an excellent quality level in the classical sense, then the influence of digitalization on the further development of education in general and education networks in particular must increasingly be considered, integrated and designed in a 'holistic future scenario'. The current state of development is already characterized by high numbers of methods, models, and concepts used, but is being improved and expanded in ever-shorter cycles.

Permanent forecasting for the future development of high-quality education and transnational education networks must be carried out, which in turn requires and initiates the further development of accumulation and transfer of competencies, recognition, and accreditation in the context of quality management for these organizations.

## 2 Systemic and Holistic Perspectives on Education Systems

A system can be described as a set of interrelated and connected elements. Especially large systems are characterized by a particularly high number of elements and relations. In order to understand the structure and functioning of systems, interdisciplinary epistemological models are developed to describe and explain complex phenomena. Global education and training systems can be regarded as large systems as well, as they also tend to have a great number of elements and relations. They are complex entities whose phenomena can be predicted by analyzing structures and functions. The founder of general systems theory assumed that, according to the inductive method, principles that are inherent in a system are also relevant for other systems. These principles include complexity, self-organization, and feedback [1].

As one of the first systems analysts among philosophers, also referred to as the founder of the Western scientific view, Aristotle explained that the whole is more than the sum of its parts [2]. The application of this knowledge to education systems therefore leads to a holistic approach. A Holon is never only a part, but always part of a whole or in other words, it is something that is simultaneously a whole and a part [3]. If education itself and systems supporting education are to be successfully developed, decomposition and the associated simplifications and limitations of the view of individual objects or processes are only useful in order to be able to better control and examine the high complexity of large systems by reducing the area of

investigation. Nevertheless, the object or process that has been isolated as a part continues to remain part of the whole.

Theoretical as well as practical developments in the field of education should be based on such holistic principles, because they are the way to enable realistic analysis, modelling, planning, and implementation of modern education systems. Holistic thinking has become increasingly established in recent years in the development of educational systems and will strongly impact future concepts and solutions in this field. The growing emphasis on interdisciplinary and transdisciplinary is an expression of the fact that a successful design of complex education systems will only be possible through overcoming disciplinary perspectives and better cooperation, not only between specialists but also with the users [4].

Transnational education networks are part of this holistic approach, which will inevitably prevail because partial planning and optimization of the subsystems could only lead to an overall optimum by chance. It is therefore important to systematically develop the connection and the close interdependence of the design of educational networks from a procedural, structural, content-related, and methodological point of view, also considering quality management in general and recognition management as well as accreditation in particular as a complex relation.

## 3 Education Systems in the Knowledge Society

Education systems are characterized by the preparation, supply, and distribution of information and knowledge. A community based on the acquisition, dissemination, and use of information and knowledge, especially by using technological progress, is defined as a knowledge society. Related to that, the terms information and knowledge need to be defined and explained [5].

Information is data in a context of meaning that can be used for the preparation of decisions and actions. It is worthless for those who cannot connect it with other current information or information stored in the past. From this point of view, knowledge could be understood as the process of appropriate networking of information. It arises as a result of the processing of information by human consciousness. In other words, information is the raw material from which knowledge is generated and the form in which knowledge is communicated and stored. The interpretation of information can be very different, especially in different cultural contexts. This context is also displayed in Fig. 1. Moreover, of particular importance is the fact that knowledge is a public good and builds the foundation for democratic societies in general [5].

Knowledge is therefore shaped by individual experiences, is context-specific, bound to individuals, and formative for the current developmental stage of society. There is a change from a prevailing industry-government dyad characterized by the industrial society to a growing triadic relationship between universities, industry, and government in the knowledge society. Following this, higher-education systems should contribute to the development of the regions in which they are located in

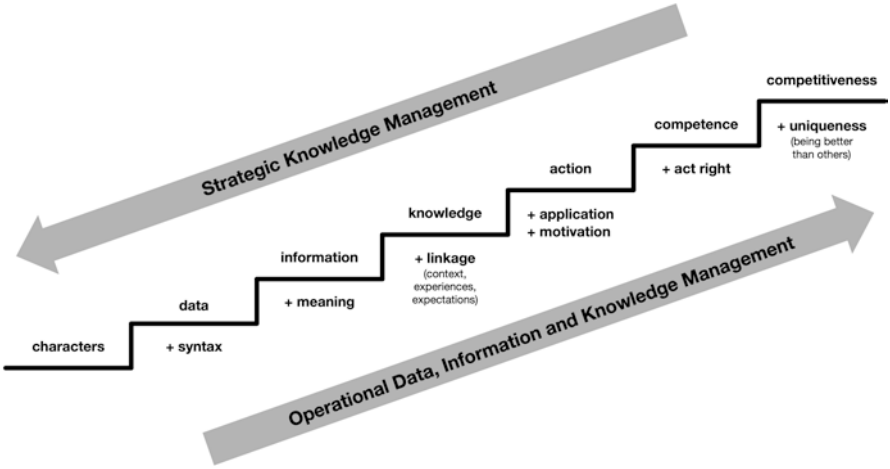


**Fig. 1** The 'Knowledge Stairs' according to North [6]

different ways, for example through employment and employability of students, increased consumer spending and revenues derived from outside the region, and the expenses of students and visitors to the university [7–9]. However, their most important role in the regional systems is the generation of knowledge, which is a crucial resource in the knowledge economy [10]. A currently recognised model of university's contribution in this respect was introduced by Etzkowitz and Leydesdorff [11]. This approach, known as the Triple Helix Model, is based on the partnership comprised of universities, industry, and government [11]. Subsequently, additional elements were appended to the model, namely civil society, public institutions as well as environmental and ecological institutions [12]. Batterbury and Hill [13] developed a model of university engagement in the regional socio-economic system based on several dimensions including education, research, knowledge exchange, public relations, community-based research, and flexible learning [14].

The idea of the Triple Helix is that the potential for innovation and development in a knowledge society lies in a growing role of universities and in the hybridisation of elements from university, industry, and government to generate new institutional and social formats for the generation, transfer, and application of knowledge. This vision encompasses not only the creative destruction that appears as a natural innovation dynamics [15], but also the creative renewal that arises within each of the three institutional spheres of university, industry, and government including their intersections. It contains collaboration and conflict moderation, collaborative leadership, substitution, networking, and consists of the knowledge space, the innovation space, and the consensus space [16].

If this practice-oriented approach is abstracted into a knowledge-based model, each stakeholder of the triple-helix concept can be seen as a knowledge node and viewed in different levels of its environment. Generally, the knowledge flows within an organization and amongst the Triple Helix stakeholders related to the knowledge

society can be modelled and mapped using theories of the design of knowledge networks as illustrated in Fig. 2.

## 4 Education Systems in the Context of Globalization

The globalization of processes in the diverse social areas and organizations is proceeding very dynamically and is leading to dramatic changes. A central problem is the resulting shortage of skilled workers, because the development of educational resources obviously lags behind the needs of administration, politics, business, and industry. Many organizations therefore rely on rapid growth and pragmatic solutions. This is quite acceptable up to a certain degree of development if it is understood and practiced in the context of prototypical development. It is possible that:

- the interests of all stakeholders are permanently recorded, evaluated, and specified;
- basic processes and functions of education systems are developed and tested;
- risks and errors of the systems are recognized at an early stage; and
- quality management requirements and quality assurance concepts are fundamentally developed.

A serious problem of the current development in the educational landscape is that in many cases, the prototypical development is continued in an evolutionary

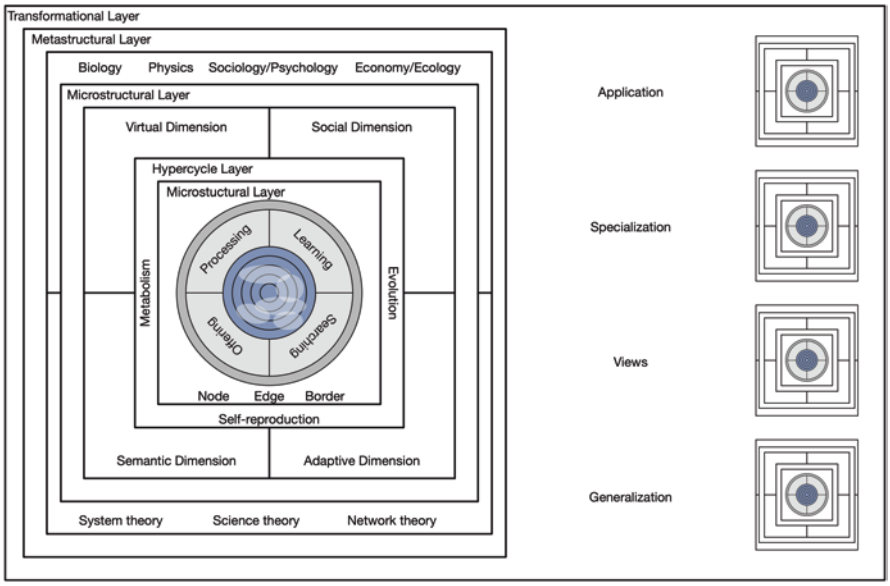


**Fig. 2** Layers of knowledge nodes and transformational environment [17]

way. Thus, pragmatic designs and solutions are permanently anchored in the systems. When the systems reach a certain size, they are difficult to handle with the implemented management methods:

- systems become increasingly inefficient;
- the complexity and complicatedness of systems are no longer controllable;
- the economic efficiency decreases; and
- sustainability can no longer be guaranteed.

Therefore, it is reasonable that after an introductory phase of the new systems for training and further education, a turning point is set following the prototypical approach. The experience and findings from the development and application of the prototype are used to systematically and theoretically develop a solution that replaces the pragmatic approach. At this point, all possibilities of modern management for designing complex and complicated application systems in education should be exhausted.

The systematic exploration and thus system theoretical explanation of phenomena in global learning in connection with processes of further education therefore requires dealing with the concept of complexity in the organizational context. In this sense and according to the BusinessDictionary [18] complexity is "the condition of having many diverse and autonomous but interrelated and interdependent components or parts linked through many (dense) interconnections." Related to organizations, complexity can be associated with:

1. interrelationships and interdependencies of individuals;
2. the effect of interrelationships and individuals on the organization; and
3. the organization's interrelationships with its external environment [19].

Complexity theory is based on concepts designed to explain phenomena of complicated and large systems. It is in turn linked to a multitude of other theories, such as information theory, chaos theories, etc.

Consequently, global learning and continuing education are topics:

- that can be characterized by features of large and complex systems;
- whose behavior is characterized by a multitude of objects and relations; and
- which can be analyzed and described by means of systems theory and complexity theory.

If global-learning and further-education systems are to be successfully developed and implemented as well as used sustainably, it is necessary to adapt and apply the management approaches derived from systems and complexity theory in a targeted manner. There is a connection between cybernetics and management as cybernetics directly influences modern management in organizations [20]. Following this argumentation, modern management methods for large systems and networks as well as complex organizations must be used consciously in order to be able to design continuous educational processes efficiently and sustainably. It is possible to

adapt and transfer general knowledge and methods from management theory specifically to the field of education.

## 5 Transnational Education Networks of Excellence

The advancing globalization implies the acceleration of the development of knowledge, technology, cooperation, etc. in connection with a rapid change and transformation in all spheres of life. The focus increasingly is on learning and there are five related developments.

- Societies and economies have experienced a profound transformation from reliance on an industrial to a knowledge base.
- There has been a strong focus and progress in measuring the learning results.
- Education has been reformed and reformed again and a continuing process of change is established.
- The rapid development and ubiquity of information and communication technology influences the further learning environments.
- The research base for learning is growing.

Therefore, the basic conditions for the recent development are the global knowledge society, lifelong learning, competence outcome orientation, the entrance of the new millennium learners, the demand for quality-driven reforms, burgeoning research on learning, and the development of learning environments.

Education is based on (amongst others):

- activities carried out by the learner in a proactive way;
- learning focused on knowledge and competence outcomes;
- the integration of knowledge structures;
- the balance of acquisition of concepts, skills, and meta-cognitive competence;
- building complex knowledge structures from basic knowledge objects bottom-up;
- utilizing explicit knowledge from the external world for organizing implicit knowledge in the mind;
- the constrains of capacity limitations of the human information-processing abilities;
- a dynamic interplay of emotions, motivation, and cognition;
- the creation of transferable knowledge structures; and
- the requirements with regard to time, space, and efforts.

The basic pillars have direct implications on the design of effective learning environments as well as the development of learning processes and systems by innovative projects [21].

Learning systems are characterized by three main directions according to [22]:

- **Credibility** embedded in:

(a) behavioral consistence (scale of intermediate theoretical construction);
(b) structuring (scale of modularity, system architecture, and formatting);
(c) explanatory (descriptive power, cognitive penetrating, epistemological adequacy); and
(d) heuristic power (scale of inference, scale of prediction, scale of learning, scale of self-control).

- **Functionality** composed by:

(a) precision (repeatability and verifiability scale, demarcation scale);
(b) economy (scale of economy of methodology and resources, scale of methodological simplicity); and
(c) functional efficiency (scale of rules representation, scale of combining procedures with structures).

- **The effectiveness** characterized by:

(a) openness of the systems (scale of extensibility, scale of elasticity);
(b) relative generality (scale of morphology, scale of a range); and
(c) utility (scale of defining the practical implementation, scale of warranty or pragmatic purposes).

If the cognitive approach will be matched with the needs of management, then three levels have to be considered [23].

- Macro level – Distance systems and theory: access, equity, ethics; globalization of education and cross-cultural aspects, distance teaching and institutions, theory and models, research methods, and knowledge transfer.
- Meso level – Management, organization and technology: management and organization, costs and benefits, educational technology, innovation and change, professional development and faculty support, learners support services, quality assurance.
- Micro level – Management, processes and functions: instructional design, interaction and communication in learning communities, learner characteristics.

All of these approaches, theories, concepts, and characteristics must be considered if education networks and programs are developed in an efficient and sustainable way. Therefore, the latest opportunities of the management theory and practice have to be applied in order to succeed with the challenges of the recent development of education in general [24].

Transnational education networks linking regional education hubs and institutions are created, resulting in very complex but also very efficient education systems that can be adapted dynamically and flexibly to the general requirements of global developments. In particular, powerful scientific subsystems are combined to form networks of excellence. As a result, clusters of high performance are placed in a permanent exchange and competition at the highest level of technology and can also be promoted specifically. The aim is that the best educational standards with the highest level of education will prevail internationally and that these can also be used

as a benchmark for the development of national and regional educational institutions and associations.

Transnational education networks of excellence enforce and promote the development of unique selling points of their own alliance in competition with other educational alliances on the one hand, and the profiling of their own members in a work-sharing process within the network on the other hand in order to achieve an even better performance. As a result, dynamic transnational education networks of excellence are emerging, which currently link high-performance educational institutions and clusters, but are also open to new partners who help improve the performance of the entire network.

## 6 Organizational Forms of Education Institutions and Quality Management

Internationalization, Europeanisation, and globalization have led to the emergence and continuous change of higher education areas within and outside Europe. All these developments naturally have a significant influence on the inter- and intra-organizational design of educational institutions and networks, especially in the field of higher education. Increasing competition orientation, growing autonomy, increased cost and benefit considerations, profiling and specialization, entrepreneurial thinking and action have a significant influence on the organizational structure in education [25].

The internal organization of educational institutions and the development of their external relations are oriented towards the general principles of organizational and network development. One can choose from the classic forms of staff positions, line and matrix organization [26]. Due to the relative independence of partners in educational networks, the high complexity of tasks and the dynamics of development, organizational forms that are at least partially based on the matrix organization are chosen in most cases. Even in the transition from relatively loose network structures to alliances and merged organizational units, matrix organization is an interesting option, because it supports the planning, implementation and enforcement of a uniform quality understanding and level of quality throughout the entire organizational and network structure (Fig. 3).

Education institutions are subject to enormous transformation because of the massive influence of digitalization, diversification, and individualization of learning and training. Usually, the education providers are too small to meet all the challenges of global changes alone. The strategic orientation has to be focused on regional, national, as well as international targets. This results in a need for greater integration, continuity, and permeability of the education domains while maintaining and harmonizing high education standards. Therefore, organizational developments are placed in the context of intra-organizational aspects. The organizations are legally and economically largely self-sufficient, but join forces in networks to

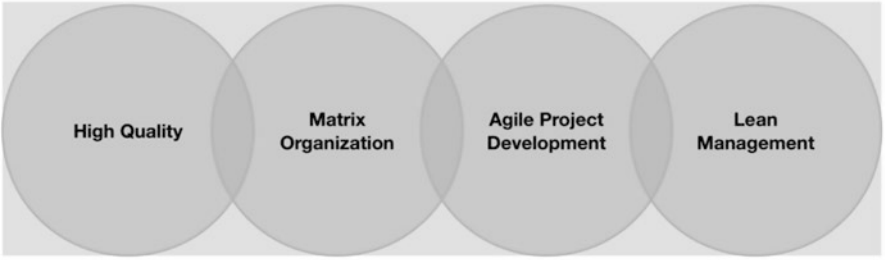


**Fig. 3** Matrix organization of international education networks of excellence

achieve greater size-related impact without losing their flexibility. Larger providers increasingly address such alliances, too.

A coalition of education institutions is supported by the demands of business and the government, the promise of quality by the single institutions, as well as by the network management. The gold standard would be the harmonization of the quality-management systems at a high level. That is why more and more education providers are implementing quality assurance according to ISO 9001 and transferring this approach into their network relations. The foundations for the implementation of education controlling including the definition of target systems are generated.

## 7 Quality and Education Networks and Institutions

The Incheon Declaration and Framework for Action of the UNESCO sets the course for the further development of education systems on an international scale by 2030 and is regarded as essential for sustainable development in the world, which is why it is part of the complex strategy and objectives of UNESCO. Exclusively, it is pointed out that it is important to ensure inclusive and equitable quality education and promote lifelong learning opportunities for everybody. Every education network and institution must be measured by its contribution to improving the quality of education and lifelong learning ($L^3$). Finally, point nine of the preamble deals with quality education and learning outcomes as an indicator for further development and point 22 of Chapter II (Goal, strategic approaches, targets and indicators) deals with the connection between increasing access and measures to improve the quality and relevance of education and learning [27].

In order to achieve these noble goals, efforts to achieve universal educational standards must be intensified at the highest possible level. Corresponding organizations with the core tasks of quality planning and quality assurance in education also need to be further developed in an overarching international and transnational context. In this area, for example, especially active institutions in higher education include:

- CHEA (Council for Higher Education Accreditation) with about 467 quality assurance bodies, accreditation bodies and Ministries of Education in 175 countries inclusive CHEA International Directory and CHEA International Quality Group (CIQG).
- ENQA (European Association for Quality Assurance in Higher Education) with 27 member states from Europe and Asia and with access for the educational organizations and educational institutions of the participating member states as well as the European Union.
- INQAAHE (International Network of Quality Assurance Agencies in Higher Education) with about 300 member-organizations.

The degree of commitment of the statements on quality assurance of the various organizations depends on their statutes. Nevertheless, all of them were founded with the aim of setting quality standards for education in their field of activity that is binding at least for the members. For this reason, all these networks in turn cooperate with other stakeholder networks and create supplementary organizations to implement higher educational standards, such as ENQA. ENQA is one of the founding members of EQAR, the European Quality Assurance Register for Higher Education, which was established in 2008 to increase the transparency of quality assurance in higher education across Europe and which publishes and manages a register of quality-assurance agencies that substantially comply with the Standards and Guidelines for Quality Assurance in the ESG, the European Higher Education Area [28].

The complexity of the task of implementing a transnational quality standard in higher education becomes clear when, in addition to ENQA, other important European decision-making bodies and documents that are relevant for the concrete planning of offers of academic education and further education are listed in exemplary form and in extracts:

- European Higher Education Area (EHEA) and the Ministerial Conferences (1999 Bologna – Paris 2018);
- Bologna Follow-up Group (BFUG) and Board Meetings;
- European qualifications framework (EQF) based on eight reference levels defined in terms of learning outcomes;
- Qualifications Framework for the European Higher Education Area (QF-EHEA).

Those responsible for the further development of educational institutions and educational networks must also take into account additional national implementations of international standards and national characteristics. For example, for study program and network developers in Germany, these are decisions, recommendations and documents in excerpts from the following committees:

- Federal and State Ministries for Education and Research;
- Conference of Ministers for Educational and Cultural Affairs;

- German Qualifications Framework (Deutscher Qualifikationsrahmen – DQR) based on the European qualifications framework;
- Foundation for accreditation of study programs in Germany including Foundation council, Accreditation Council and Board of the Accreditation Council;
- Accreditation agencies;
- German Rectors' Conference;
- Qualifications Framework for German Higher Education Qualifications related to the Qualifications Framework for the European Higher Education; and
- German Council of Science and Humanities (Wissenschaftsrat).

If international commitments are made in order to pursue transnational network development, both the requirements of the international bodies and the national institutions of the regions and countries involved must be taken into account.

It can be seen that global, European, national, and regional regulations are overlapping, resulting in an enormous increase in complexity. In addition, numerous exceptions and special rules must be observed. Certain standards apply only to specific tasks of educational institutions of a specific type. For example, German universities naturally orient themselves towards ISO 9001 because they are bound to it when introducing and implementing institutional quality-management systems, but ISO 29990 is only relevant for universities in the field of in-company training and further education.

The work of international and national quality and education networks and institutions up to the general standardization organizations already has a huge influence on the design and implementation of special quality standards in education. This process will be intensified and accelerated in the coming years and will have enormous effects on evaluation and quality assurance in education. An overview of quality regulations that affecting education in Germany is set out in Table 1.

**Table 1** Essential quality regulations for education in Germany

| | Global | Europe | Germany | Regional |
|---|---|---|---|---|
| TQM | | EFQM | PAS 1037 | |
| MMS state of the art | ISO 9001 | | | |
| | ISO 29990 | | | |
| Derivations ISO 9001 | | | DVWO QM | |
| | | | BQM | |
| | | | QVB | |
| Implementing aids ISO 9001 | IWA 2 | | AQW | |
| Quality systems | ISO/IEC 19796–1 | EQUALS | AZWV | Seal of quality network training |
| | IACET (USA) | Q-For | LQW 3 | 'Bremer Modell' |
| | | | QESplus | Hamburg Test Seal |

Own table based on [29]

## 8 Quality Assurance for Education and Training Systems

Quality initiatives concern all areas of education. Corresponding quality programs are implemented in all universities, using Total Quality Management (TQM) and Continuous Improvement (CI) as suitable formats. This means that generally applicable standards from this area can also be used and applied with the corresponding specifications [30].

The international efforts concerning standardization serve the gradual development and implementation of a common level of quality worldwide. The above-mentioned ISO 29990 was developed specifically in accordance with ISO 9001 for quality assurance of learning offers and learning services in the area of in-company education and closes a gap in the sense of a comprehensive set of rules for quality assurance in education. Examples for the comparability of these two international standards are set out in Table 2.

The development of ISO 21001 is an important step towards the future standardization of education systems and the associated quality assurance in the education field, as set out in more detail by Anttila and Jussila [32]:

> *The international standardization committee ISO/PC 288vi, "Educational organizations management systems – Requirements with guidance for use", has started very recently the work of harmonizing quality management of the educational organizations with the other organizations of the society by using the common professional approach. The committee is creating at the first phase the standard ISO 21001vii viii, which is now at a working group internal (WD) draft stage. Experts from 39 countries are participating in this work, and the final standard can be expected to be completed within a couple of years. This standard is*

**Table 2** Derivation of special educational standards from general quality standards

| Examples for the comparability of the two norms | |
|---|---|
| ISO 9001 | ISO 29990 |
| 7.2.1 Identification of the requirements in respect of the product | 3.1.2 Demand of interested and aggrieved parties |
| 7.1 Planning and product realization | 3.2.1 Determining aims and the extent of the learning offers |
| | 3.1.3 Learning content and learning process |
| 6.3 Infrastructure | 3.2.2 Determining resources for supporting and supervising the learning transfer |
| 6.4 Working environment | 3.3.2 Ensuring availability and access to learning resources |
| | 3.3.3 Learning environment |
| 6.2 Personnel resources | 4.6.1 Competences and skills |
| 6.2.2 Competence, training and awareness | 4.6.2 Evaluate competencies of the LDL, the performance management and professional development |
| 8.2.3 Supervision and measurement of processes | 3.5.1 Evaluation objectives and extent |
| 8.2.4 Supervision and measurement of products | 3.5.2 Evaluation of learning |
| | 3.5.3 Evaluation of learning services |

Own table based on [31]

*based on the general requirement standard ISO 9001:2015ix that is applicable to all kind of organizations. The standard ISO 21001 will challenge all educational organizations, because it requires the adoption of the general basic quality concepts and quality management structures and practices. The standard will enable educational institutions to demonstrate their ability to consistently provide education to learners that is applicable to the legal and regulatory requirements and hence increasing the credibility of the organization, and aim at enhancing satisfaction of the interested parties of the educational organizations. This standard also advises educational organizations to develop their quality management that can promote the ability to identify where the requirements are being met, where the gaps may exist, and the areas where improvement can be made.*

The ISO 21001 standard clarifies that performance measurement and evaluation must be considered from different perspectives – monitoring, measurement, analysis, evaluation, internal audit, management review, self-assessment -, whereby the connection between quality, accreditation, and recognition management is explicitly recognized and emphasized.

However, there are still gaps in the fields of activity for international standardization, because standardization only keeps pace with the dynamics of development to a limited extent. Despite all theoretical, strategic, and exemplary progress, the task of global quality standardization in education is a lengthy process that will be repeated continuously at the next higher level. In line with the triple-helix approach, stakeholders will also have to repeatedly find contemporary, pragmatic solutions for quality assurance in education, adapted to the state of the art. Transnational education networks of excellence have been emerging worldwide for over 10 years, but there is no special standardization in the area of quality assurance. The pragmatic answer to this situation is to follow the standards of other areas and fields of application.

## 9 Recognition and Accumulation of Competencies for Planning and Implementation of Educational Cooperation

An increasing standardization for all tasks and processes in the education sector is countered by the growing diversification through profiling and specialization as well as the possibility of the increasing individualization of knowledge acquisition through better target group orientation and adaptation to lifelong-learning processes. Quality management and quality assurance in education must be placed in this context. The tendency towards more mobility and higher volatility of students requires complex adjustments of processes and structures as well as regulations and profiling on the part of education providers, whether as individual institutions or as networks. Professional management of recognition and accumulation of competencies is a prerequisite for mastering these new forms of mobility and volatility among students.

According to today's general international understanding, all efforts of universities must be directed towards a competence-oriented output. The central task of higher education is therefore the transfer and acquisition of competences. However, they are not always acquired in the same educational institution and therefore recognition as well as accumulation and transfer are regarded as essential components of the performance record for acquired competences. Recognition refers to achievements already made in the higher-education systems while accumulation and transfer refer to competences acquired outside the higher-education systems. The Lisbon Recognition Convention has named rules that have been recognized by national bodies in Europe and a large number of partner countries worldwide. This recognition system is constantly being further developed.

Recently, UNESCO prepares and adopts conventions and recommendations at international and regional levels in the field of Higher Education in the framework of the Global Convention on the Recognition of Higher Education Qualification Project. According to the UNESCO and their Education 2030 Agenda as well as current global trends in higher education, the preparation of a Global Convention aims to facilitate academic mobility, improve quality and enhance international cooperation in higher education [27]. This challenge is justified in the document with massification of higher education, diversification of higher education provision, changes in the paradigm of learning, employability, quality and quality assurance, internationalization of higher education, academic mobility, internationalization of research, and financing of higher education. It explicitly contains the clear commitment to the "promotion of coherence between quality assurance, qualifications frameworks and the recognition of qualifications".

Accumulation of competencies and transfer have a different reference. They are about the competences acquired outside the university and their accumulation. There are few approaches and models for this topic in the international context. For Germany, the Conference of Ministers of Education and Cultural Affairs has published rules for accumulation; the essential criteria are as follows [33].

- Admission to higher education is guaranteed in accordance with the applicable requirements.
- Acquired knowledge and skills are equivalent in content and level to university requirements.
- The universities have quality-assurance systems in operation.
- The criteria for accumulation and transfer are checked in the course of the accreditation.
- The scope of the accumulated/transferred achievements amounts to a maximum of 50% of the university studies.

In Germany, universities have been obliged since 2015 to draw up and implement regulations for the recognition of knowledge and skills acquired outside the university. Reference is made explicitly to the connection between accumulation for higher education and quality management [34].

In practice, especially in the development of recognition and accumulation for transnational networks of education, recognition, and accumulation management

has proven itself to be an integral part of all planning and implementation in order to achieve a high-quality standard. In the generally more developed areas of recognition management, special continental and national regulations are compared in order to reach a bilateral or multilateral solution, in addition to the fundamental findings of international standardization. In the event of deviations between the applicable legal systems for education, contractual agreements are made which enable the recognition of parts or entire courses of study in accordance with the applicable law. Transnational agreements are advantageous because they provide the framework for individual or target group-specific solutions.

The field of credit management, such as ECTS in Europe, is much less developed, which is why it is less used in transnational cooperation. As a rule, bilateral or multilateral agreements of the partner institutions involved are used to regulate the concrete cases in the course of complex quality-assurance measures. Due to the global competition in education and the high complexity of the topic, standardization efforts in this area are particularly complicated and time-consuming. Due to the development of lifelong learning and the demand for greater permeability of education systems while at the same time maintaining a high level of quality, credit management should be brought more into the focus of education development, especially in the context of transnational education networks of high excellence, so that it does not prove to be an obstacle to the further internationally dynamic development of modern education systems. In concrete cases of planning such training networks, rules were formulated in the contracts that enable concrete cooperation on a pragmatic basis and the integration of specific credit-management solutions.

## 10 Accreditation as an Evaluation of Educational Quality

Initiated by the Bologna process, extensive regulations on qualification frameworks and evaluations both at national and international level were created in Europe. Just like the corresponding accreditation systems, they serve to enhance control of increasingly complex processes at high standards of quality.

The German accreditation system has proven its worth, but it will be adapted to the new challenges by harmonizing the collaboration of the governmental authorities with education and business providers. An output-orientation indicates more decision-making autonomy for the actors in the processes and better control of the results of learning and training activities by experts from the triple helix. Because these European and international adaptation processes are sometimes slower than the changes in reality and because of their autonomy, some universities rapidly expand their international activities and join international quality networks as well as accreditation and evaluation associations and systems. The responsible persons for transnational education cooperation have to match national quality assurance and accreditations in such a way that, despite existing differences, the comparability and recognition of the study programs and degrees are ensured.

The visions of the UNESCO guidelines for the recognition, validation, and accreditation (RVA) of the outcomes of non-formal and informal learning are characterized by the following aspects [35].

- RVA is a key lever for lifelong learning to become reality.
- RVA provides visibility and value to the hidden and unrecognized competences that individuals have obtained through various means in different phases of their life.
- RVA significantly improves individuals' self-esteem and well-being.
- RVA motivates further learning and strengthens labor market opportunities.
- RVA helps to integrate the broader population into an open and flexible education and training system.

Therefore, recognition management becomes a key success factor for the individual as well as organizational development in education and training. The recognition of competences obtained in non-formal and even informal for formal academic careers will be developed as a complex interactive service [34].

Recognition management is the generic term for all different coordinated organizational, working, and legal processes to be able to deliver the services. It includes the accumulation and transfer management as a quantitative result of the recognition as well as the accreditation as part of the quality assurance [36].

Experience from the development of transnational education networks, cooperation and study programs shows that these are very complex, comparatively time-consuming and medium to long-term projects. Accreditations serve in particular to evaluate the quality of the study programs, whereby differences in the following aspects must be taken into account:

- belonging to global and international educational philosophies with intercultural characteristics;
- target systems and the maturity stage of the educational landscape and educational institutions;
- national and regional rules and regulations in general and accreditations in particular;
- development status and degree of maturity of the respective accreditation systems;
- system of degrees, in particular duration and grades;
- contents of studies as well as program and module structure;
- accreditation processes, structure and content; and
- development of existing quality management systems and quality awareness.

If there is a common will of the partners to cooperate and a conducive political framework for the educational activities of transnational networks, then accreditation systems and projects prove to be extremely motivating and driving elements in the design of very well coordinated study programs of high quality and as a suitable instrument for evaluation in the broader context of network development.

The accreditation process is at the end of the program and module development for new or re-accredited study programs. In the case of national or transnational

network cooperation, these developments are carried out partially or, as in the case of joint degrees, completely jointly. The new accredited offers are embedded in the overall program. This is followed by a full program evaluation, which is a prerequisite for further program development. In the context of network cooperation, further certifications and general quality control may be required. In addition, the interaction of several partners enables a benchmark to be carried out and new project ideas to be generated and evaluated. This is done within the framework of corresponding research projects, whereby further research and development impulses can also be set by the teaching-focus of a university (Fig. 4).

This approach creates a multiple effect in the interplay of the three main missions of a university: teaching, research, and social obligations [37]. Accreditations as evaluation instruments reveal strengths as well as weaknesses in both teaching and research and force constructive discussions to solve the identified problems and weaknesses. This provides new incentives for the further development of both areas.

- Teaching is better qualified through appropriate research profiles.
- Research results are better and faster integrated into teaching.
- Teaching initiates new R&D projects.
- Special, teaching-related research improves teaching and learning processes.
- Transparency and profiling of research and teaching improve the social conditions for universities.

In transnational educational institutions, multilateral cooperation between several partners from different countries creates additional effects through international knowledge transfer in teaching and research, as well as economies of scale due to the number of cooperation partners. The third mission, social obligation, must also be realized in an international context and generates new knowledge, methods and applications.

If, in addition to the analysis of strengths and weaknesses, opportunities and perspectives are also considered, this is a classic SWOT analysis, linking accreditation and evaluation processes with professional methods of economics. This combination of professionalization of processes and the methods used has proven itself in

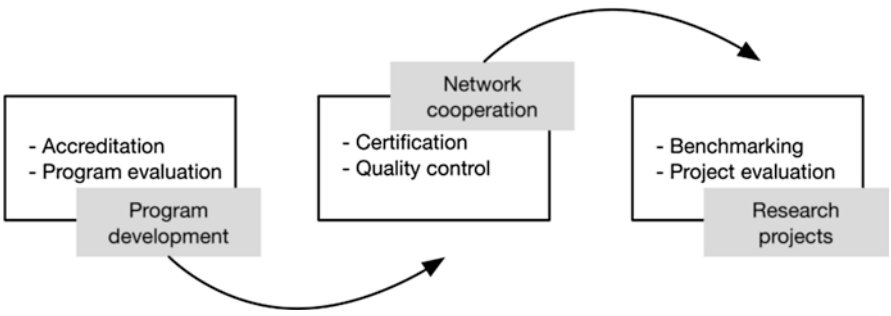


**Fig. 4** Impact of accreditation on network developments and research incentives

such complex projects as the development of transnational networks of excellence in education.

## 11 Stakeholder Management of Transnational Education Networks of Excellence

The planning, design, and successful introduction of transnational commitment networks presupposes that all major stakeholders are identified and involved. An overview of stakeholders related to education organizations and networks following the triple helix model [11] is displayed in Fig. 5. The general stakeholder theory focuses on realigning the organization in terms of corporate culture by moving from thinking solely in terms of loss and profit to focusing on value creation for the various

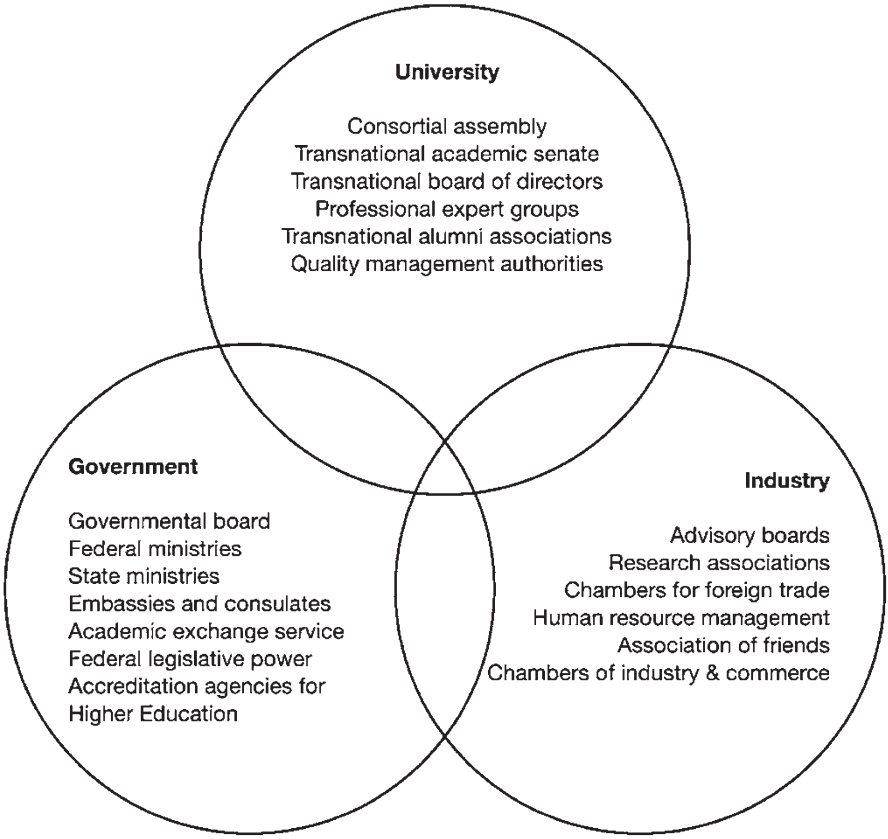


**Fig. 5** Cooperation of stakeholders groups following the triple helix approach. (Own Figure based on [11])

stakeholders. TQM is a philosophy that focuses the organization on better satisfying customer needs. There is therefore a connection between the two, which should be transferred to the area of higher education in order to strengthen the interaction of the various groups of stakeholders, above all in terms of quality improvement and quality assurance. Stakeholder management is therefore closely related to quality management and is decisively influenced by the special management of accreditation, evaluation, accumulation, and transfer as well as recognition processes.

Since transnational education networks are characterized by a significantly increased number of stakeholders, the risks and opportunities in the context of stakeholder management and its influence on the generation of consistently high quality throughout the entire network, including the relevant internal and external stakeholders, also increase. Currently, only partial and tangential testing and evaluation procedures for stakeholder management in connection with network management and quality management are mapped in accreditation procedures. For this field of accreditation, further research and investigations are necessary in order to also establish the constructive-critical analysis in this important field of accredited study programs in educational networks. If the topic of networks of excellence is reflected upon, then additional quality demands, opportunities, and risks increase due to the increased requirements regarding selection and permanent control of the generation of quality at the individual partners as well as in the entire network.

Recognition management as well as accumulation and transfer management must also be regulated in international relations in order to be able to generate a joint educational offer at all. As a rule, they are therefore an integral part of quality assurance through accreditation in the individual countries as well as transnational accreditation procedures, which usually have to be carried out in parallel. Since the main stakeholder groups are represented in the accreditation commissions, the connection to stakeholder management is indirectly established. Interesting constellations of cooperation between the different nationalities and interest groups arise in very complex accreditation procedures based on the corresponding accreditation and recognition systems. If the triple-helix approach already mentioned is used, then several committees and groups are active in each of the three pillars. The representation of interests of the stakeholders in turn includes representatives of all international partners involved.

This development has a direct influence on the requirements of the people involved in the diverse roles. The transition of the human type from *Homo Oeconomicus* to *Homo Cooperativus* [19, 38, 39] is an essential prerequisite for excellent cooperation in such complex networks. Under these conditions, individual weaknesses or social restrictions mean that the successful design of transnational networks of excellence in education is made massively more difficult or even prevented.

## 12 New Challenges for Transnational Education Networks Through Digitalization

The changes caused by digitalization and the resulting digital transformations in a global context are increasingly accelerated by the development of smart systems. It is an overall social phenomenon that must be solved in an overall social approach and understanding [40].

With regard to the political dimension of this development, the focus is on a digital policy that implies the following guidelines for digital transformation: growth and participation; transformation instead of disruption; fostering technological and social innovations; social-policy compromises and experimentation areas; maintaining individuals' employability; further developing the regulatory framework; strengthening trust and security in the handling of data; etc. [41].

The diverse initiatives worldwide are increasingly being translated into educational strategies for national and international educational concepts. Challenges exist with regard to environmental, economic and social aspects, underlining the importance of digital ecosystems. A shared vision of the OECD is related to the following complexes.

- Need for new solutions in a rapidly changing world.
- Need for broader education goals: Individual and collective well-being.
- Learner agency: navigating through a complex and uncertain world.
- Need for a broad set of knowledge, skills, attitudes and values in action.
- Competencies to transform our society and shape our future.
- Design principles for moving toward an eco-systemic change [42].

All existing and planned strategies, concepts, models, implementations including the associated cooperation must now be rethought and usually modified in the course of digitalization. It is important to identify the requirements for education in the digital transformation based on the overall social framework for future life, work and working hours. From this, the challenges for globalized and lifelong digitized learning can then be derived, for example in the form of theses such as the following.

- Digital transformation must become part of the teaching content.
- Awareness of social acceptance and change is part of an education for digital transformation.
- Digital transformation enables new forms of teaching and learning.
- Digitized teaching will play a growing role for educational processes.
- Open education, education for everybody, is facilitated by digital transformation.
- The digital transformation leads to a stronger individualization of education and life planning.
- All interfaces of education and training must be coordinated in the process of lifelong learning.

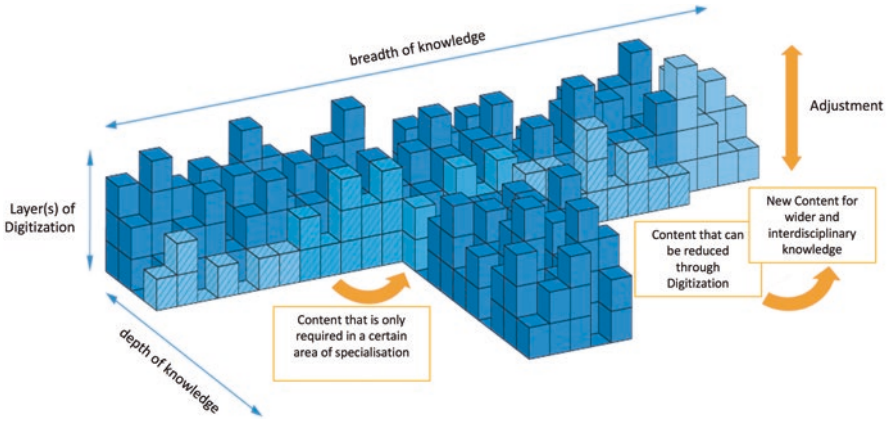


**Fig. 6** Processes in the three-dimensional T-shape-model [43]

- The selection and evaluation of information becomes more important, the relevance of the availability of knowledge decreases [43].

The impact of digitalization on transnational education networks is significant. The two-dimensional view of the breadth and depth of knowledge and competencies to be acquired up to now is supplemented by a third dimension: the all-encompassing digitalization. This context is illustrated in Fig. 6.

All components of an education system, including transnational education networks, must be more or less digitized. In multilateral and transnational organizations in particular, state-of-the-art methods of educational planning and curricula design enable the control and management of complex processes and states. Semantic knowledge models are developed for the content orientation of digitized study programs, which contain the essential knowledge for digitized transfer in education in a structured form.

From this, two-dimensional excerpts for the design of study programs can be derived, which help to generate both standardized modules and complex offers as well as individualized learning faculties by means of morphological schemes.

If opportunities and risks of digitalization on quality, accreditation, and recognition management are considered, the advantages of these new opportunities outweigh those of very complex, transnational networks in particular. Notable aspects for this type of digitized applications in multilateral forms of organization with comprehensive educational offerings are:

- greater transparency in the development, implementation and operation of complex study programs;
- new opportunities for combining standardized educational modules and more individualization of educational paths;
- accelerated knowledge acquisition, knowledge structuring and knowledge exploitation;

- better comparability of education modules and offer structures;
- accelerated education services through digitalization of routine processes;
- extended learning independent of time and place; and
- improved evaluation and feedback processes etc.

All these possibilities considerably improve quality, recognition, and credit management and offer opportunities for the further development of accreditation procedures, especially in transnational networks.

With digitalization, the spiral of educational development will once again pass through all phases, so that every phase and every element can be checked for digitalization in every phase, in order to then contribute to overall digitization. This makes the development of education systems agile. The educational systems and their components, including the degree of digitalization in general and transnational education networks including quality assurance, accreditation, and recognition in particular, are being further developed [24].

The state of development of the systems is validated and evaluated using maturity models. There are general models for determining digital maturity that can be tailored to different areas of application [44].

Transnational education networks have a high affinity to the service sector. Thus, in the future, the quality of the networks of education service providers could also be evaluated with regard to general and digital maturity level for accreditations.

## 13 Conclusions and Future Perspectives

The development of Transnational Educational Networks of Excellence is based on developed quality management systems and their close integration with the design of accumulation and transfer, recognition and accreditation. They are key factors for the successful planning and implementation of these complex forms of organization and have an influence on a wide range of processes and functions when taking a holistic approach to education systems. The following relevant conclusions can be drawn from this.

- Focus on individual needs or specific demands of organizations.
- Increasing diversification of education and training resulting in higher consumption of resources.
- Unification and modularization in educational modular-designed systems.
- Networking of education providers and education offers.
- New forms of recognition of competences acquired outside of the own educational organization.
- Lifelong learning based on transparency and consistency of educational and working processes.
- Teachers more and more as instructors and coaches rather than facilitators.
- Up-to-datedness, flexibility, adaptability, reusability of learning and content management systems as well as of their subsystems and objects.

- Combination of technical and methodological competencies with social and soft skills.
- Accreditation and evaluation systems supplemented by new methods of reviewing learning progress and learning success

Moreover, the digital transformation will bring about a significant change in education systems through the combination of classical methods with artificial intelligence and automation of the educational processes. Smartness as a generic and key term in this context will also increasingly shape education systems [45].

According to Zhu et al. (2016), smart-learning environments comprise ten key features.

1. Location-awareness: in smart learning the location in real time is important data that the systems need in order to adapt the content and situation to the learner.
2. Context-awareness: exploring different activity scenarios and information.
3. Socially-awareness: sensing social relationships.
4. Interoperability: setting standards for different resources, services and platforms.
5. Seamless connection: providing continuous service when any device connects.
6. Adaptability: pushing learning resources according to access, preference and demand.
7. Ubiquitousness: predicting learner demands until clearly expressed, providing visual and transparent access to learning resources and services.
8. Whole record: recording learning path data to mine and analyse in depth, then providing reasonable assessment, suggestions and pushing on-demand service.
9. Natural interaction: transferring the senses of multimodal interaction, including position and facial expression recognition.
10. High engagement: immersion in multidirectional interactive learning experiences in technology-enriched environments [46].

According to Hwang (2015), the three key features of a smart learning environment are continuously aggregated to:

1. Context-awareness: the system must be able to provide learning support based on learners' online and real-world status;
2. Adaptive support: the system must offer instant and adaptive support to learners based on their individual needs from different perspectives (learning performance, learning behaviors, profiles, personal factors, etc.), as well as the online and real-world contexts in which they are situated;
3. Adaptive interface: the system must be able to adapt the interface to the user (ways of presenting information, learning preferences, learning performance, etc.) The user interface can be any mobile device (smartphones, tablet computers, etc.), wearable device (a digital wristwatch), or even ubiquitous computing systems embedded in everyday objects [47].

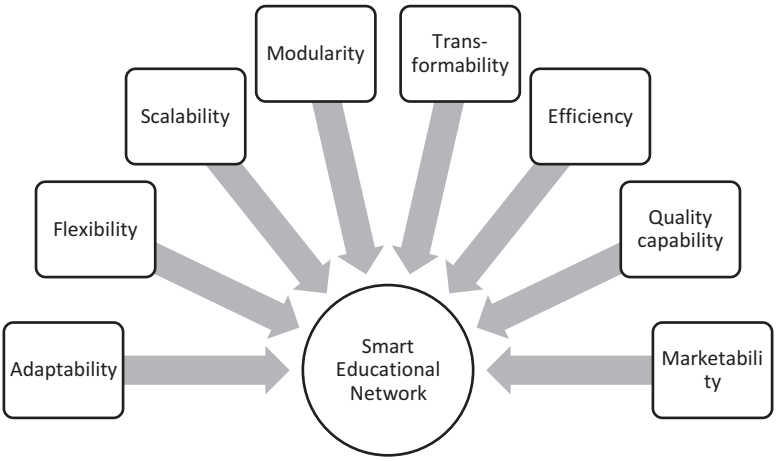


**Fig. 7** Characteristics of a smart educational network deduced from smart systems theory

The holistic approach of Smart Worlds of Learning will induce the development of smart education networks (of excellence) in a national as well as transnational context.

Within the framework of an innovative process for organizational development, the key drivers will also be relevant for general system and network development for smart educational networks of any type, size, and form, the characteristics of a Smart Educational Network are displayed in Fig. 7.

A holistic view of what is probably the most complex form of educational cooperation in the course of transnational networks of excellence promotes the systematic and effective embedding of quality, accreditation and recognition management in a global education landscape. This crosses the boundaries of education 4.0 in the European understanding and opens the transition to organizational forms for Education 5.0 based on a smart Educational Ecosystem.

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# Is There More to Quality Assurance Than Quality?


**Ossi V. Lindqvist**

**Abstract** The European criteria for Quality Assurance (QA) were originally established in 2005, based on the Bologna Declaration by 29 European countries in 1999. They are based on the European Standards and Guidelines (ESG) of Quality Assurance in the European Higher Education Area (EHEA). ESG has been used, and modified, for use also by several countries outside Europe. The QA process may sometimes involve accreditation, which generally gives *Yes/No* answers, but Europe has moved towards periodic audits, with a strong enhancement and development approach.

Quality in higher education is a multidimensional concept, but generally it is interpreted as being fit-for-purpose. It is usually based on the ability of an institution to fulfill its stated aims, based on its mission and strategy. The starting point is the strategy, is it realistic, is it sustainable, is it relevant, and does it support good ethical practices? But the strategy of a university also needs a long-term national strategy as a background support, and also for overall national development. An important part of such a strategy should also include the research development and the services to the society components. Furthermore, the process of QA requires full commitment from the institution's administration top-down, and it should involve the entire academic community, including staff and students. The entire process should be open and public, and thus communicated also to the institution's stakeholders and outside partners. Yet, crucial tools for the QA process are proper databases, about the institutions themselves and about the entire national higher-education system at large, which should be augmented also by analyses of the job market and its possible trends. Up-to-date databases are necessary tools for the management of an institution and also for setting national policies.

O. V. Lindqvist (✉)
University of Eastern Finland, Kuopio, Finland
e-mail: ossiv.lindqvist@uef.fi



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_4

Crucial for the success of a QA system is that it is based on trust among all the partners involved, within the university and with the outside agency as well as with the outside society at large. Trust is a tool for universities to make proper and critical self-evaluations. Trust means that the peer review is impartial and independent with the sole aim of good quality. Trust can also be strengthened by an open and communicative process, and with the final quality assessment being of public domain. It should be expected that with time the QA process leads into a culture of quality within the institution, and it is doing 'just a good work'. In the Arab states, the next step could be a formation of a true Arab Higher Education Area.

**Keywords** Quality assurance · Arab universities · European Bologna process · Trust-building · Strategy · Capacity development · Databases · Research

## 1 Introduction

The role and importance of accreditations and Quality Assurance (QA) systems have been well recognized in Arab countries and Arab universities, though the processes themselves are still evolving. The Arab Network for Quality Assurance in Higher Education (ANQAHE) was established in 2007 as a non-profit, non-governmental organization, though it is not yet covering all Arab countries. The stated purposes were to create a mechanism between the Arab countries to exchange information about quality assurance, to construct new quality assurance agencies or organizations, develop standards to establish new quality assurance agencies or support the already present ones, to disseminate good practice in quality assurance, and to strengthen liaison between quality assurance bodies in different countries. These aims are all commendable, yet an interesting issue again is how well and in which form they have been or are being implemented.

The question expressed in the title actually implies that quality in this context in higher education is not purely a matter definition, though definitions certainly exist, but that quality is rather a process which should involve the entire higher-education system in the country, and preferably even regionally, and covering all their strategic functions. Naturally the key elements in the QA process are the universities and higher education institutions at large, and thus QA should be present and part of their everyday functions. It is not a one-shot event that comes and is then forgotten, but it involves continuous actions and measures towards improvement, also supported and carried along by institutional learning. All of this should thus be based on the institution's own will to learn and to improve. And throughout the process the underlying issue is how to create and maintain the necessary trust between all the partners involved to keep it running smoothly and effectively. A practical example of the complexity of issues in higher education in terms of quality and quality assurance and what they involve is the European Bologna Process.

## 2 The European Bologna Process

The European Bologna Process was initiated in 1999 by a joint declaration of 29 countries to reform their higher-education systems in a convergent way. In fact, all the subsequent measures and developments have been based on this declaration, though the measures and actions have also been developed through subsequent European Ministerial meetings at 2- or 3-year intervals. The overall aim was to create the European Higher Education area (EHEA) by the year 2010; thus it is still evolving and planned to be achieved by 2020. The current number of countries in EHEA is 48, including both European and non-European ones. The central association of quality-assurance agencies in Europe is ENQA, *the European Association for Quality Assurance in Higher Education*, which currently includes 51 members from 28 countries. In addition, ENQA has close affiliation with a number of bodies with interest in quality assurance in Europe, East Asia, the Middle East, and also in the Americas. ENQA is also the founding member of the European Quality Assurance Register (EQAR).

The recent Bologna Process Implementation Report describes its current aims and implementation status [1, 2]. It also contains an extensive set of data and graphs of all the basic features of the current Bologna Process and its implementation status.

The concept of EHEA identifies three key issues that make it up, namely the implementation of the three-cycle degree structure, recognition of qualifications, and quality assurance.

*The three-year cycle* involves the Bachelor, Master's, and Doctoral studies, the first two cycles consisting of 3 + 2 years of study. Its main tools comprise of the European Credit Transfer and Accumulation System (ECTS) measuring the student's workload; the full-time academic year is equivalent to 60 higher education credits. The ECTS system is now used across the European Union and other collaborating European countries.

*The recognition of qualifications* is a formalized structure indicating learning-level descriptors and qualifications, both at national and international levels. In the Bologna Process Implementation Report mentioned above, special emphasis is also for further measures '*that appropriate procedures are established and followed for recognition of qualifications of refugees, displaced persons and persons in a refugee-like situation'*. Presently this would be a pertinent aim also in and for the Arab countries, and actually it is a timely issue all over the world.

The practice of *quality assurance* (QA) has been the key element in the Bologna process from the very beginning, and it is still developing, both as a concept and as a practice. It involves the European standards for internal and external quality assurance of the institutions, and for external quality assurance agencies. It was first created in 2005 as '*Standards and Guidelines for Quality Assurance in the European Higher Education Area'*, or ESG. Its second and modified edition appeared in 2015 [3]. It has been translated into a number of other languages.

Both the higher-education institutions and the QA agencies are to be subject to cyclical reviews. The European Quality Assurance Register for Higher Education (EQAR) is listing those QA agencies that comply with the ESG. There also exists a comprehensive database of external quality-assurance results, maintained by EQAR. It is important to recognize that the need for appropriate databases should apply throughout the system, from the institutions themselves, through the Ministries at the national level, but also at the regional level for the sake of comparisons and cooperation alone.

Furthermore, this analysis of the Bologna Process Implementation Report of EHEA also strongly stresses the importance of improving both *learning and teaching* as fundamental bases of the Bologna Process. This should require and involve specific long-term strategies and measures both at the national level but also within the higher-education institutions themselves. Learning itself should be seen as the final outcome of education, and not only the students being present in teaching.

The Bologna Process has been facing the issues of *social dimension* from the early on, that is, paying attention to various kinds of disadvantaged learners; e.g. students from low- or medium-educated families may be underrepresented in higher education, as their drop-out rates are often high, and their opportunities for lifelong learning may be non-existent.

The next important target in the Bologna Process is *employability* and employment of recent graduates. It is a significant problem not only in Europe but actually also throughout the Arab region. Thus systematic efforts to improve the links and relations between higher education and the labour market need to be further developed. Several kinds of actions are needed, including labour market analyses and forecasts, and even involving employers' participation in the curriculum planning and in higher education governance, with career guidance services, and also encouragement of student mobility.

One further aim of the EHEA is also *internationalization* and engagement in international activities, and this also should include staff mobility. Within Europe, this has been seen as an important element not only from the academic standpoint but also to create deeper international understanding of other people and of other cultures.

The final assessment of the Bologna Process deals with *values*. Specifically, academic freedom and autonomy of higher education institutions are highlighted. This should also involve student and other stakeholder participation in the democratic governance and management of higher education. The assessment ends with the statement that there is a continuous need to discuss the values that unite higher education systems, and to be vigilant that robust legal protection is in place – including defining and limiting the role of governments in the organization and management of higher-education institutions.

An interesting general issue often discussed is the role and importance of the Bologna Process in defining Europe at large, e.g. as discussed by Kushnir [4], but see also an earlier article by Terry [5]. Certainly, its role is seen as pivotal in shaping the role and meaning of Europe, and higher education and education at large could be seen as the centre of European policy-making and in shaping the essence of

Europe. There is a unanimous concern for the quality of education in all European countries and the QA process serves as one of the unifying concepts. In a way, the Bologna Process is expanding its borders even outside Europe, though problems e.g. involving territory-identity compatibility are also emerging. But these issues should also show the dynamism of the European concept. Some of the elements of the Bologna Process have been adopted also outside Europe, and this process seems to be continuing, in the Middle East and even also Africa.

The overall developments and the state of QA in Europe during its first decade of existence are presented in a comprehensive analysis by Bollaert [6], but see also ENQA [2].

## 3 QA, Case Finland

Finland has been participant in the Bologna Process from early on, and an active member in the development of the European QA systems at large. Europe shows diversity in its higher-education systems, for historical reasons alone, but the case Finland can present also some common concepts and developments in the QA.

Originally, the European Ministers agreed that the national QA systems should include a '*system of accreditation, certification or comparable procedures'*. Finland adopted a *quality audit* type of procedure, starting in 2005. Each higher-education institution (HEI) could decide itself which type of quality system it is following that best fits its strategy and intended tasks. From the very beginning, every Finnish HEI was willing to go through the audit by the Finnish Education Evaluation Centre (FINEEC), formerly the Finnish Higher Education Evaluation Council (FINHEEC), but the universities are also free to approach all credited international quality agencies or organizations.

All the audit standards are based on the European Standards and Guidelines (ESG). Yet the more detailed criteria are set in consultation with the HEIs, and they are public. FINEEC has produced a special *Audit Manual* [7], where the audit process is described and it is also of public domain. The audit process involves partly a peer review, often also international, but it includes also student and labour-market representatives. The audit report is published, and it is fully and publicly available. FINHEEC then gives a quality certificate to the HEI that has passed the criteria, and it is valid for 6 years. If deficient in some way, the HEI is given 2 years' time to remedy it, and then re-audited. If an HEI is unsatisfied with the Evaluation Committee's decision, it can make use of the FINEEC's appeals procedure.

The key issue here is that all FINEEC evaluations are based on *quality enhancement*, and are thus strongly development-oriented. The motivation of the HEIs for audits is thus also based largely on their enhanced national and international competitiveness and visibility.

Furthermore, each audit is based on a *specific contract* between the HEI and FINEEC; thus it is not seen as limiting the autonomy of the HEI. Each HEI is

responsible for its own quality, and the role of FINEEC may primarily be that of a 'helper' or 'liaison' towards better quality.

The main issue here is that the overall process aims towards mutual *trust-building*, so that the HEIs really feel that they can gain from the exercise involved in the audit. Such trust will also support both the legitimacy and accountability of the audit process and its results. FINEEC has undergone an external cyclical review by ENQA in 2016, and thus it is also included in the European Quality Assurance Register (EQAR).

After every 6 years, the HEIs must undergo another audit, but it is now more directed to some special issues or targets within the HEIs and their functions, by their own choice, instead of a full-scale audit covering the entire institution. With better targeting, the overall administrative costs can come down in subsequent audits. FINEEC is also performing some system-wide evaluations on selected topics, e.g. in life-long learning and further education.

An overall concern within the Bologna Process in Europe has been the standards being applied consistently. Also, certain language difficulties may emerge with the common terminology because of the diversity of languages and cultures between different countries, though English is the 'official' language. One good attempt towards resolving this was the workshop on *Language of the European Quality Assurance*, organized by ENQA already in 2006 [8], but see also Vlăsceanu et al. [9].

The overall legitimacy of QA may not only depend on its formal 'legal' status, but more crucially that the QA process itself is transparent and coherent throughout Europe, and performed with credibility, also with application of the proper ethical standards, and noting the rights of the institutions themselves. An important part of this transparency and trust-building is that the QA agencies and the evaluations are truly independent in their functions and devoid of conflict of interest.

Finally, the leadership and governance of each university and HEI play an important role in the implementation of its QA system. Yet, still every university has 'quality'. The final stage of the QA process should not be the organization itself, but creation of *quality culture* that embraces the whole institution, from top down.

## 4 Challenges of Arab Higher Education in QA

The Arab university systems can currently be best described as dynamic in many respects. It has been undergoing a long-term expansion, often in diverse ways. Overall, the system is relatively young, mostly established in the 1970s, and well over a third of them have started only since 1990. This follows the overall policy in the Arab countries where education has had a top political priority from early on. However, in several Arab countries the higher-education sector shows strong duality, with a presence of also the private system. Apparently, the private sector has been a response to the increasing demand for education, with all its benefits but also risks involved [10], also indicating that the public sector has not been able to follow flexibly enough the educational market demands. The Gulf countries especially

seem to have resorted to a kind of imported internationalization in this respect. Overall, higher education in most Arab countries has been characterized by a long-time expansion phase, and the pressure is not lessening. Thus, it is expected that also the development of QA systems in Arab countries is in varying phases, with varying degrees of coverage, but its importance for higher education at large and for national wellbeing has been widely recognized. But the problem seems to be in finding proper tools and resources to move ahead.

With time, the issues related to the overall quality and relevance of education have become more apparent through the entire education systems, as it is difficult if not even impossible to build a proper higher-education system if not supported by the relevant school systems. This dilemma has been widely recognized, and the performance pressure for high-quality higher education is getting more intense, especially with the new national social and economic policies for renewal of Arab societies and their economies towards internationalization, and also towards lessening their dependency on oil and gas [11]. The overall quality of education has also an important social dimension, especially with the emergence of the private sector that may divide the nation into poor schools and good schools, and in a similar way in the higher-education system, according to the students' capacity to pay. Quality education should be a privilege that is offered to all students, regardless of their background.

The ANQAHE is now over a decade old, and it is still working towards attaining a true and coherent link between the Arab countries and their forms of higher education, though many important and encouraging steps have been taken. One of its partner organizations is the Association of Arab Universities (AARU), which has many parallel aims, but it still does not cover all the higher-education institutions in the Arab world either. ANQAHE also works closely with the International Network for Quality Assurance Agencies in Higher Education (INQAAHE). Currently, most Arab countries have established their own national agencies for QA.

Several Arab countries have taken concrete steps towards developing a true QA system, also with help from international organizations, but its practical implementation is still at various stages of development, and true regional cooperation and coordination are mostly missing. A Qualifications Framework within the ANQAHE Model has been developed, but its true impact at the grass-root level is not documented. The same seems to apply to the issue of Quality Assurance of Cross-Border Higher Education (CBHE) initiated by ANQAHE. The roles of many of ANQAHE's international donors and partners are also noteworthy in these activities.

A word of caution about the use of QA since it is not a direct remedy to some of the basic faults of the HE sector in a country. These may include, among others, basic shortage of funding of higher education at large; biased structure of the offerings of universities, e.g. with too few students in the STEM fields; teaching based on rote learning, with an absence of independent and critical thinking; poor curriculum structure; the culture of accreditation deeply embedded in the HE system; shortages of data on 'what is there', within the institutions, in the national higher-education systems at large, and also ignorance on the structure and demands of the labour market. Many Arab universities also seem to keep international ranking lists as a

guide for their apparent 'quality', which they are not, and the rankings do not replace a true QA system [12]. It is also possible that the criteria used in rankings are actually guiding the HE strategies and policies rather than being independent tools for development, as analyzed by Hazelkorn [13]. The tail can be wagging the dog!

It is apparent that in the Arab world there are too few higher-education organizations to ensure proper QA standards and their application at the institutional level, with such an authority that can create trust in and among the institutions. Their impacts, if any, seem to be variable at best. There is a lot of activity and many meetings are being held, but the true impacts both regionally to say nothing at the institutional level are still waiting, though yet plenty of good will exists. The national agencies, where they exist, often seem to be rather direct branches of the government, and not showing the professional and ethical independence that is necessary for a proper QA process. Quality assurance is not the same as quality control, but should involve a strong element of development and enhancement.

The higher-education plans and policies that the governments have given out often seem to be expressions of good intentions or visions, but not the real strategies with proper targets and means to achieve the goals. Thus, it may be difficult to develop clear QA measures and actions that are fit-for-purpose. The purpose comes from the proper institutional strategy and may indicate a shortage of management and planning capacities, which then seems to be replaced rather by sheer controls. But this could also lead into subdued autonomy for the institutions also in terms of their overall management, but also in terms of quality development. The problems may be aggravated by the structure of the faculty personnel, often with a lack of tenure. The teachers may be working on short-term contracts only, a situation which does not support long-term commitments and development, to say nothing of creating a quality culture but also a proper research culture within the institutions. The roles of students as a creative force in higher-education management and in QA processes need to be upgraded. However, the overall situation in the QA development may vary greatly from country to country, and at least the needs for more effective systems seems to be widely recognized. For further discussions and descriptions of surveys on QA problems see also El Hassan [14] and Faek [15].

Besides QA, the crucial problem in the development of Arab universities is the future role of *research* in them, though the issues are functionally closely linked. The research university is recognized to be a central institution of the twenty-first century – providing access to global science, producing basic and applied research, and educating key leaders for academe and society, to quote Altbach [16]. One of the main challenges facing Arab higher education now is opening up to the demands of society at large, especially as the pressure for the diversification of the economies grows larger, followed also by demands for expanding labour markets and for more jobs for the expanding graduate cohorts who come out of universities. The public sector cannot meet this demand for jobs any more to the extent it used to do in the past, and the pressure is now directed at the development of a stronger private economic and business sector.

The lesson from the rest of the world is that most if not all research universities tend to be public or at least semi-public institutions, as they are expensive to run,

and the 'profits' that emanate from them are usually felt only after long periods of time and in many diverse forms. A special culture of research and of quality is also required. There is always a special need for institutional autonomy, but so is also demand for their accountability, by the government, the public, the students, and also by the market itself.

Developing research in the university is putting new pressures on its overall strategy and planning capacity, and on sustained funding and budget management as well. Productive and long-time research needs stability and continuity in its working environment, and these requirements concern both the ministries as well as the institutions. Furthermore, a strategy should require hard choices at the ministerial level, that is which institutions and fields to support and which way; the same requirement may apply also the institutional level. A single university cannot be good in every field, and thus a level of national cooperation may also be needed. Yet teaching (and learning as well) in every higher education institution should be based on research. But development of the research component in a country should not only depend on the universities (and research institutes), but it also requires the involvement of the whole society and its infrastructure. One example of supporting elements is the presence of science societies and further-education organizations that could be instruments for spreading scientific knowledge and understanding among the people at large.

But the crucial element for success is the student and the scientist itself, and only a good basic education and training can produce good scientists. Furthermore, science basically is an international endeavor, which requires linkages and cooperation with the wide world, and further supported by mobility of students and staff as well. Thus the importance of both national and institutional strategies grows even bigger, since good research demands proper infrastructure, including laboratories and other facilities, and the overall research funding system has to be developed as well, both nationally and within the institutions themselves.

These all are issues that should be dealt with and be part also of the QA system, directly or indirectly, when developing the research component in a university. The QA process does deal with research directly, but it should provide for a proper environment and means for successful research.

Still, the central role of a university, and that of a research university even more is educating the next generation of people for the society, and QA itself can be a great contributor to this task.

## 5 Some Final Words

Yes, there is much more to quality assurance than the sheer act of quality assessment. The process should be part of a system that involves many partners, supporting legislation, and coordinated measures both at the national and institutional level to support the long-term strategies. The strategy itself gives the target for the quality

process, as quality is defined as something that is fit for the purpose. Shortly, quality starts with the proper purpose.

The European Bologna Process is one example of a QA system, and it can provide examples of a number of good practices. But the Arab world could and should also develop its own system, fit for the local conditions, though the basic principles of good QA practices may be independent of locality but kind of universal as also based e.g. on common human rights.

Development of a QA system in Arab countries also requires a lot of capacity building, at all levels of the education system, and especially now that the universities are facing new challenges with population growth, and the need for developing the national research capacity. Thus, the request for adequate financial resources is also emerging, but a proper quality culture in an institution can also be very helpful in eliminating wasteful practices that do not serve well the intended strategy.

QA also requires regional cooperation among the higher-education systems between the Arab countries but also internationally for a truly successful outcome and results. Admitting that many deep political, historical, and cultural differences exist within the region, yet the QA systems could serve as neutral platforms to bring the universities and the higher-education systems closer together into good cooperation and common policy development. The European Bologna Process could serve as a proper example in this very task.

But I would like to close this with the optimistic note that the Arab countries have commonly recognized the need for quality education at large, and a quality higher education in particular. It surely is one the best ways into a better future for the Arab people in the twenty-first century.

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# The Importance of Safeguarding Functional Independence in External Quality Assurance Decision-Making Activities


**Carol L. Bobby**

**Abstract** This chapter explores the meaning of functional independence and its importance in making accreditation decisions and conducting other external quality-assurance (EQA) review processes in higher-education institutions and their offerings. Specifically, the chapter will include sections on why, in an increasingly global market place, EQA organizations must be able to demonstrate functional independence from undue political/government influences and professional guilds through a careful structuring of their review and decision-making processes. The chapter will further explore how EQA organizations can ensure functional independence through the establishment of written policy statements that safeguard the independence of their (1) standards-setting activities; (2) decision-making activities; (3) review processes conducted by staff and on-site reviewers; and (4) policies and procedural practices established by the members of the decision-making body.

**Keywords** Accreditation · Conflict of interest · Quality assurance · Functional independence · Higher education

## 1 Introduction

Technological advances have changed the world dramatically in the last 20 years. Communication now occurs instantaneously between individuals and organizations residing on opposite sides of the world. Within hours, people are transported from one country to another to provide expertise and/or disaster relief assistance, as needed. The globalization of professions and the ability of professionals to move across borders have created a global marketplace for service industries ranging from

C. L. Bobby (✉)
Council for Accreditation of Counseling and Related Educational Programs (CACREP), Alexandria, VA, USA

International Network of Quality Assurance Agencies in Higher Education, Barcelona, Spain
e-mail: carollbobby@gmail.com



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_5

finances and medicine to architecture, design, and engineering. Higher education has also become a globalized service industry and today's institutions, faculty, and students are crossing borders in ever increasing numbers to share knowledge and skills and to foster student learning.

The fast pace at which higher education has been globalizing has not, however, occurred without growing concern about the quality of what is being offered, especially as new institutional structures (e.g., for-profit institutions, transnational institutions) and new forms of teaching and learning (e.g., online degree programs, massive open online courses or MOOCs) have emerged. Unfortunately, in many regions of the world, the increasing numbers of higher-education institutions (HEIs) offering degree programs in various regions of the world has outpaced the ability of countries and regions to effectively monitor both the credibility and quality of the education being offered by these new institutions. In particular, the low-income and least-developed countries with burgeoning populations are trying to meet growing demands for higher-education market place, often with too few resources or inadequate government support. It is these countries in particular which need more support for the establishment external quality-assurance (EQA) systems with qualified staff and trained reviewers who can determine if the institutions are offering quality degrees. Then there are countries, such as those in the Arab region, that have experienced such dramatic increases in the number of transnational higher-education institutions (HEIs) campuses offering new forms of degree programs, that even well-funded EQA systems have difficulty keeping pace with the how best to conduct quality-assurance reviews [1].

Although most countries and/or regions of the world today have established some form of national or regional external quality-assurance agency (EQAA) for reviewing the quality of the higher-education institutions and programs being offered by HEIs within their jurisdiction, there remain wide variations with regard to the extent that an EQAA's operations are linked directly to government support. In many cases, nationally based EQAAs have been established by and operate directly under the jurisdiction of a government's Ministry of Education. In other cases, such as in the United States, EQAAs may be independent corporations that operate without a government mandate. In either case, EQAAs must be able to demonstrate functional independence from undue political or economic influences in all aspects of conducting credible quality-assurance reviews of higher-education systems in order for their results to be meaningful to *all* of higher-education's consumers. For if higher-education's consumers – students, families, employers, and governments – suspect that an EQAA's decisions and processes are being manipulated by political or economic forces desiring or dictating that only certain specified outcomes be reported, then the credibility of the EQAA's processes and published outcomes will be lost and the ability to trust that student learning is comparable across borders will be marginalized.

## 2 Safeguarding Functional Independence in Four Key Areas

The credibility of an EQAA's outcomes should not be underestimated. Credibility is the cornerstone to building public trust that graduates who have earned degrees in one region of the world have the skills and knowledge to be able to use those skills and knowledge both ethically and safely in another part of the world. Thus, the credibility of the reviews and decisions made by EQAAs affects the mobility of persons working across borders, as well as the cooperation of governments in making trade agreements for goods and services. It is, therefore, imperative that EQAAs be able to demonstrate functional independence – that is, freedom from unwarranted bias in its review procedures and decision-making processes – in four key areas if they are to gain and maintain public credibility. These areas include the EQAA's (1) standards-setting activities; (2) the structure of decision-making body and its decision-making protocol; (3) institutional and programmatic review processes (both staff reviews and on-site visit reviews); and (4) policy development.

In each of these areas, there are identifiable good practices designed to assist EQAAs in developing operational procedures and policies that will foster transparency and fairness in the establishment and application of standards, improve consistency in the conduct of reviews, and protect the agency from conflicts of interest situations. Examples of good practices for each of the four areas have been drawn from the following documents:

- *CHEA Recognition of Accrediting Organizations: Policy and Procedures (revised June 2010 edition)* [2] published by the Council for Higher Education Accreditation, which is based in the United States of America;
- *ESG 2015 – Standards and Guidelines for Quality Assurance in the European Higher Education Area*, published by the European Association for Quality Assurance in Higher Education (ENQA) [3]; and
- *Guidelines of Good Practice (2016 revised edition)* [4], also referred to as the GGP and published by the International Network of Quality Assurance Agencies in Higher Education (INQAAHE), a globally-based membership organization for EQAAs and others interested improving higher-education quality-assurance processes.

## 3 Ensuring Credibility in the Establishment and Maintenance of EQA Standards

Establishing and maintaining standards or criteria for use in evaluating the quality of higher-education institutions and their degree programs cannot be done in a vacuum. The HEIs being evaluated, as well as the public consumers of

higher-education offerings, need to know that the criteria used by an EQAA have had appropriate vetting with higher-education experts and other stakeholders such as employers, subject specific professionals, public officials, and industry representation. The public must have faith that the criteria being used to measure quality are relevant to the institutions, relevant to preparing graduates for future employment, and relevant to meeting the societal and economic needs of a country or region within a globalizing marketplace. Thus, it is imperative that EQAAs openly seek broad consultation when adopting standards or when revising standards. In today's digital world this can be done through survey research and open calls for comments on draft standards. Yet often, to gain meaningful feedback on new standards, the EQAA will need to seek out experts and representatives from a variety of consumer groups who may be willing to participate in focus groups or other types of feedback sessions.

## *3.1 Two Elements of Good Practice When Developing Standards*

While there are a variety of ways that such feedback can be obtained, INQAAHE's Guidelines of Good Practice, GGP Criterion 3.2.2 (page 8) [4] identifies two key elements that an EQAA should incorporate into its practice for developing standards. These are (1) consultation with stakeholders, and (2) regular revision of the standards to maintain relevance. The regular revision of criteria is considered extremely important today as technological advancements have continued to shift the landscape of higher education. In fact, in the latest revision of the INQAAHE GGP included a new criterion, GGP 3.2.3 which states that "standards or criteria take into consideration the specific aspects related to different modes of provision, such as transnational education, distance or online programmes or other non-traditional approaches to higher education as relevant to the context in which they operate" (page 8) [4].

Similarly, the CHEA Recognition Criterion 12.B [2] requires EQAAs to demonstrate public accountability with regard to its standards-setting and standards-implementing activities in two ways. First, the EQAA must have "standards that call for institutions to provide consistent information about academic quality and student achievement and thus to foster continuing public awareness, confidence, and investment" and second, the EQAA must "itself demonstrates public involvement in its accreditation activities for the purpose of obtaining perspectives independent of the accrediting organization" (page 5) [2]. CHEA's policy goes on to state that: "Representatives of the public may include students, parents, persons from businesses and the professions, elected and appointed officials, and others" (page 5) [2].

Finally, ENQA's ESG Standard 1.1 [3] also focuses on the need for institutions to conduct broad consultation with both internal experts, as well as other stakeholders in the development of their internal quality assurance processes. Specifically, this standard states the following:

> *Institutions should have a policy for quality assurance that is made public and forms part of their strategic management. Internal stakeholders should develop and implement this policy through appropriate structures and processes, while involving external stakeholders.* (page 11) [3]

Since the EQAA is expected to have criteria that evaluate the effectiveness of an institution's process for carrying out its internal quality-assurance policy, it follows that the ESG would have similar requirements for EQAAs to demonstrate accountability to its own stakeholders, as documented in ESG 3.6 which states that "agencies should have in place processes for internal quality assurance related to defining, assuring, and enhancing the quality and integrity of their activities" (page 23) [3]. The guidelines for this particular standard go on to say that "agencies need to be accountable to their stakeholders" (page 23) [3]. This alludes to the need to implement periodic review of EQAA activities for continuous improvement purposes and the need to maintain high professional standards to ensure the relevance of their services to institutions, specifically, and to society, in general.

In summary, to ensure credibility in the establishment and maintenance of standards used by EQAAs to evaluate the quality of higher-education institutions and their programs, it is imperative that the EQAA's standards-setting and/or standards revision activities include two key elements – broad consultation with both internal experts and external stakeholders and a provision for periodic reviews of the relevancy of the standards. The manner in which the broad consultation is conducted and timeline of the periodic reviews should be transparent and made publicly available.

## 4 Ensuring Independence in Decision-Making

The functional independence of the governance structure is another critical element in ensuring the credibility of any agency's external quality-assurance process. Often referred to as a board of directors or a board of commissioners, the individuals who comprise the EQAA's governing body must be seen as free to make decisions based solely on the extent to which institutions meet the agency's published criteria. Favoritism based on any given institution's reputation, personal or political connections, and/or economic influences has no place in the decision-making process, for it has the ability to undermine trust and credibility in the entire EQA process. For this reason, good practice dictates that the structure and composition of the governing body allow for independence in decision-making to ensure that impartial decisions can be made. Recognizing that persons who agree to serve on such board will likely have relationships with certain institutions or with faculty in different programs, an EQAA's governing board should have clear mandates for how its members can avoid conflicts of interest situations, both real and perceived.

Organizations that conduct quality-assurance reviews of EQAAs, such as CHEA, ENQA and INQAAHE, have very clear statements regarding the need for

independence in the structure of EQAA governing bodies as shown in the following criteria:

- *The composition of the decision-making body and/or its regulatory framework ensure its independence and impartiality*. (*INQAAHE GGP Criterion 1.3.2, page 6* [4])
- *Agencies should be independent and act autonomously. They should have full responsibility for their operations and the outcomes of those operations without third party influence.* (*ENQA ESG Standard 3.3, page 22* [3])
- *ELIGIBILITY. To be eligible for CHEA recognition, the accreditation organization:*
  - *Is non-governmental* (*CHEA Eligibility Requirement 9.B, page 3* [2])
  - *Demonstrates independence from any parent entity, or sponsoring entity, for the conduct of accreditation activities and determination of accreditation status* (*CHEA Eligibility Requirement 9.G, page 3* [2])

While the CHEA requirements prohibit recognition of an EQAA whose operational mandate is government-based (either state or federal), it should be noted that there is an historical precedent for the US accreditation system to be separate and independent from the government. The US system of accrediting institutions and programs grew out of the diversity of institutions well over 100 years ago and has been staunchly supported by the US-based EQAAs and institutions themselves who believe that a national regulatory system will, in the long run, interfere with the richness of degree offerings available and the choices made by consumers. On the other hand, ENQA's ESG requirements, which do not have such a prohibition provide further guidance on how to safeguard organizational independence from third-party influence through obtaining official documentation that outline the rules. This is especially necessary if the EQAA's mandate to operate comes from the government or if there are ties to other organizational stakeholder groups, such as guild associations. In addition, the ENQA requirements stipulate that the organization's autonomy be safeguarded through the development of procedures whereby the nomination and selection of experts to the decision-making body are undertaken independently from third parties such as HEIs, governments, and other stakeholders (ESG 3.3. Guidelines, page 23) [3]. In short, organizations that recognize the legitimate practice of EQAAs require documentation that the governance structure of the agencies are functionally independent from third-party influences that could jeopardize the credibility of QA decisions made with regard to an HEIs performance.

## *4.1 The Roles of Public Members in Ensuring Independence and Confidence*

Another good practice for ensuring public confidence in an EQAA's decision-making process is the CHEA requirement to include public members on the governing board alongside higher education experts (CHEA Recognition Criteria 12.D.1, page 7) [2].

Although most boards include a majority number of higher-education experts, due to their having an in depth understanding of higher-education systems, public members can nevertheless serve an important watchdog role by focusing their interests on how the EQAA's processes contribute to the quality of the education provided by HEIs to students. Public members also can monitor how the EQAAs processes ensure that HEIs offer degree programs that meet the social and economic needs of their regions. Finally, public members can bring much needed expertise to an EQAA in areas that may not be directly related to specific QA decision-making, but instead focus on the operations of the EQAA in other important areas such as financial stability, public relations, and resource issues.

## *4.2 Avoiding Conflicts of Interest*

In addition to creating a governing board that has functional independence from third-party influences, the members of the governing board must also be provided with a clear understanding of what their individual and collective roles are with regard to safeguarding the credibility of the decision-making process entrusted to them. As individuals, they must be cognizant of their own biases and acknowledge when they have information about an institution that might influence their ability to render an impartial decision. As a group, the members must make it acceptable for individuals to declare a concern or conflict of interest and then excuse themselves from the review and decision-making process for any given institution. Also, as a group, the governing body should offer information through published procedures and policies that explains the types of situations that can constitute conflicts of interest and how to avoid them.

Because it is not unusual for HEI faculty and administrators to know their colleagues at other institutions, through joint research and other professional endeavors, it is also not unusual for the possibility of a conflict of interest to arise. This is why good practice dictates that an EQAA's establish policy, as seen in INQAAHE's GGP Criterion 1.1.3, which states that "the EQAA [have] a clear and published policy for the prevention of conflicts of interest that applies to its staff, its decision-making body, and the external reviewers" (page 6) [4]. Similarly, the guidelines for ENQA's ESG 2.4 include a statement that "the agency ensures the independence of the experts by implementing a mechanism of no-conflict-of-interest" (page 19) [3]. Finally, although CHEA's recognition requirements do not reference the term *conflict of interest* per se, there are explicit requirements for EQAAs to have "appropriate and fair policies and procedures that include effective checks and balances" (CHEA Criterion 12.D, page 7) [2].

## 5 Ensuring Adequate Resources Exist to Conduct Qualified Independent Reviews

For EQAAs to function effectively, there must be adequate resources to carry out the review processes. CHEA Criterion 12.D states that for EQAAs to become CHEA-recognized, there must be "predictable and stable resources if they are to meet the expectations of institutions, programs, and the public" and that there are "adequate financial, staff, and operational resources to perform its accreditation functions efficiently and effectively" (page 7) [2]. Similarly, ENQA's ESG 3.5 states that "agencies should have adequate and appropriate resources, both human and financial, to carry out their work" (page 23) [3], while INQAAHE's GGP 1.4 states that in addition to a "well-trained, qualified staff able to conduct external evaluation effectively and efficiently," there must also be adequate "physical and financial resources necessary to fulfill its goals" and carry out its mission (page 6) [4].

### *5.1 Ensuring Fairness and Impartiality: Human Resource Considerations*

An EQAA's human resources usually include employed staff members who work directly within the offices of the EQAA and a cadre of well trained and highly qualified volunteer peer or expert reviewers. Good practice dictates that the same requirements for impartiality and independence in decision-making expected of the members of an EQAA's governing board should be applied to the staff who may be responsible for the initial processing and external review application received from HEI, as well as to the persons assigned to conduct the on-site review once the application is approved. Thus, as cited previously, INQAAHE's GGP Criterion 1.1.3 requires an EQAA to document that there is a "clear and published policy for the prevention of conflicts of interest that applies to its *staff* …and the *external reviewers*" (page 6, italics added) [4], in addition to the decision-making body. INQAAHE's GGP Criterion 3.3.5 further expounds on the importance for external review procedures to explicitly prevent conflicts of interest so that the EQAA can "ensure that any judgements resulting from external reviews are based on explicit and published criteria" (page 9) [4].

Good practice also dictates that the staff and the on-site reviewers understand the mission and goals of the EQAA, along with being well-versed in the criteria used in decision-making and in the procedures for conducting the external reviews against the criteria. Thus, all human resource personnel either hired as staff or selected to serve as expert external reviewers should be oriented not only to the stated purposes of the EQAA and the philosophical underpinnings of why EQA is important within the higher-education communities of interest, but there must also be training that provides an in depth understanding of how the EQAAs policies, procedures, and

criteria are to be implemented. It is these types of human resources training that will allow for fairness and consistency in the review processes of the EQAA.

The importance of ensuring consistency in the application of QA criteria and in the decisions being made (which are based in large part on how the criteria are applied by the staff and expert review teams) is extremely important as noted in the requirements for recognition outlined by CHEA, ENQA and INQAAHE. CHEA Criterion 12.D.2 states that in order for an accrediting agency to become CHEA recognized, it must provide evidence of policies or procedures that "foster reasonable consistency in reviews of institutions or programs while respecting varying institution or program purposes and mission" (page 7) [2]. The guidelines for ESG 2.5 also emphasize the importance of consistency in the application of standards, stating "in the interests of equity and reliability, outcomes of external quality assurance are based on pre-defined and published criteria, which are interpreted consistently and are evidence-based" (page 19) [3]. Finally, INQAAHE not only emphasizes consistency through its GGP, but further notes that the reviews and evaluations will occur "in a consistent way, even if the external panels, teams or committees are different" (GGP 3.3.6, page 9) [4]. This good practice is augmented by INQAAHE's included focus on a need for training of staff and external expert reviewers, as evidenced by its criteria below (italics added):

- GGP 1.4.1 The EQAA has a *well-trained, qualified staff* able to conduct external evaluation effectively and efficiently in accordance with its mission statement and its methodological approach (page 6) [4]
- GGP 1.4.3 The EQAA provides systematic *opportunities for the professional development* of its staff (page 6) [4]
- GGP 3.3.4 The EQAA has clear specifications on the characteristics and selection of external reviewers, who must be *supported by appropriate resources and training materials* such as handbooks or manuals (page 9) [4]

In summary, having sufficient numbers of persons (human resources) to carry out the external review processes offered by an EQAA is important, but only if the personnel are provided with an understanding of the mission and goals of the EQAA and how to fairly and consistently apply the criteria used in the review process and for decision-making purposes. Training is a critical element for safeguarding the independent and impartial decision-making, which will determine the status of the EQAA's credibility in the global marketplace.

## 6 Establishing Policy and Procedures to Ensure Functional Independence

Good practices for EQAAs are nothing more than ideals unless the organizations clearly set forth, in writing, the reality of their expectations in terms of safeguarding the functional independence of its operations. For this reason, EQAAs must take

great care not only to transparently share their criteria for evaluation with constituents and the public, but also to openly establish and publish their agreed upon policies and procedures that affect all aspects of its operations. Such policies and procedures can range from an outline of the process for determining how the governing board membership is selected to how onsite expert reviewers are selected for any given visit or from policies related to avoiding conflicts of interest to procedures related to decision-making protocol.

Perhaps one of the most important set of policies that an EQAA can develop to insure its functional independence and, thereby, to ensure its credibility with the publics its serves, is to have conflict of interest policies relevant to the EQAAs governing board members, external review experts, and staff. There are many examples of conflict of interest statements used by EQAAs to safeguard independent and impartial thinking in all levels of the review process. Sometimes an EQAA will develop one single, comprehensive policy to cover conflicts of interest relevant to any group of persons who are involved with the EQAA from staff to board members to committee members to team members or other independent contractors [6]. Other agencies may choose to develop separate policies for each group of persons involved the EQAA's review process. An example of this is when there is one document that outlines conflicts of interest for board members, one for onsite team members, and another for staff members [7]. But regardless of which approach an EQAA chooses – one statement versus separate statements – all conflict of interest documents should have some common elements and those persons affected by the documents (governing board members, volunteer expert and/or on-site reviewers, and staff) should be asked to read the policies and sign them, acknowledging their agreement to abide by them, prior to beginning service with an EQAA.

## *6.1 The Basic Elements of Conflict of Interest Policies*

Governing boards have fiduciary responsibilities for the organization; therefore, any conflict of interest policy developed for the membership of such boards must acknowledge this responsibility. Language should include acceptance by the board members that they will carry out these responsibilities in good faith recognizing that they must make their fiduciary-related decisions in the best interest of the EQAA only and not let their service responsibilities to other organizations interfere with their views. To avoid any appearance of a conflict of interest, some EQAAs may wish to require that their members not serve on any similar organizations' boards during their agreed-upon term of service. Such requirements can insure that third-party influences can be avoided in decision-making and policy establishment.

Another common element found in many conflict of interest statements created specifically for those who serve on an EQAA governing board is the requirement to maintain confidentiality of proprietary information. There are two reasons for this. One is to guard against persons seeking board positions for financial or reputational advantage. Service on such boards is usually considered an honor and a privilege,

but the information held when one is still serving as a board member cannot be used to advance one's own or an associate's business advantages. A second reason to include nondisclosure clauses in a conflict of interest statement is to ensure that information gained during an EQA review about any HEI's operations (whether current or future) is not prematurely shared in a misleading or harmful way, especially when the information is considered tangential to how the EQAAS's criteria are being met. There are simple statements that may be included in a conflict of interest policy, such as those cited below as excerpted from the CACREP Policy Document (revised 2018, page 29) [7]:

- *Members of the Board shall not use their position on the Board or information obtained as a result of their service on the Board to obtain financial gain or advantage for themselves or members of their family or business associates.*
- *Members of the Board shall not disclose any confidential or proprietary information.*

A final consideration for inclusion in conflict of interest policies for governing board members is a statement of what may types of situations may constitute a conflict of interest (both real and perceived), especially in relation to making decisions about an HEI's compliance with the EQAA criteria. Examples might include situations where the board member has a past or present relationship with the institution under consideration or has a current relationship with a person who is employed by or closely associated with the institution. For example, the board member may have been a former faculty member or administrator at the HEI under review for a decision or the board member could be married to someone working at the HEI under review. Similarly, the board member could be involved in conducting a major research project with faculty at the HEI under review by the EQAA's governing board.

With regard to conflict of interest policies for on-site visitors or expert reviewers, it should be noted that the EQAA, as well as the HEI under review, should take all necessary steps to jointly identify visiting team members for whom no conflict of interest exists. This is often done by allowing institutions the option of requesting removal of any name from the list of potential team reviewers if there is a known conflict of interest. However, it is also incumbent upon visiting-team members, when asked to participate as onsite reviewers for a particular institution, to self-identify any potential conflicts of interest. Examples might include previous consultations with the institution on their internal quality-assurance processes, intent to apply for a position at the HEI under review, having a personal relationship with any employee at the institution, or being currently employed at an institution that competes for students. When organizations choose not to provide examples of potential conflicts of interest, reviewers are often asked to contact the organization for consultation to with staff to determine if there is reason to decline from participating in the review [5].

EQAAs may also desire to have conflict of interest statements by which staff should abide. Although staff members generally do not participate directly in the final decisions-making phase regarding an HEIs compliance with an EQAA's criteria, they are nevertheless in a position to influence the outcomes of the process.

Therefore, staff members must be committed to full disclosure and restraint from reviewing any institution and/or program for which they may have a real or perceived conflict of interest. This is especially important when staff serve as paper or desk reviewers of an HEIs documentation to determine readiness for hosting a site visit. Examples of conflicts of interest in these situations may be a staff member who periodically teaches as an adjunct professor at a local HEI or a situation where the staff member has a very close friend or family member working at the HEI under review. In these cases, having a policy requiring staff to disclose possible conflicts of interest and remove themselves from conducting any element of the review can avoid uncomfortable situations when negative decisions are made. Following these types of policies provides the EQAA with the verification it needs to prove, when necessary, that no part of the review process was unduly influenced by outside knowledge.

## *6.2 Procedural Implications Related to Conflict of Interest Policies*

Most conflict of interest policies focus on the responsibilities of individuals to recognize their responsibilities for assuring that the decisions they make, as related to the reviews processes of the EQAA, represent independence of thought that is uninfluenced by personal need or outside, third-party information. In addition, these policies identify the responsibilities of those working on behalf of the EQAA to disclose any information that has the potential or being seen as conflict of interest. What the policies do not generally include, however, are the procedures that can be implemented to avoid such conflicts. Thus, EQAAs should consider the development of such procedures. For example, if a governing board's members are selected on specific needs for geographic or other diversity factor representation, along with specified levels of experience, then the selection process should outline these expectations. While specifying such factors, it is quite easy to also include requests for disclosure of other service activities to other organizations with which the individuals under consideration are currently involved. Asking for this information up front – before the selection is finalized – can avoid the appearance of conflicts of interest. Similarly, in the selection of team members, the EQAA may maintain easily accessible records on the educational and work experiences of the trained team members, which can assist in identifying potential conflicts of interest before asking persons to serve on teams.

Another procedure is to institute periodic training that updates both new and experienced personnel on issues such as (1) what constitutes a conflict of interest in the conduct of EQA reviews and decision-making, (2) how conflict of interest situations can affect the functional independence and destroy public trust in the EQAA's process, and (3) what steps can be taken to avoid conflict of interest situations.

Training can also be used to ensure that those persons responsible for implementing the criteria without external biases also implement the criteria fairly and consistently. This is done by having a policy requiring for "update" training be completed by those persons who wish to continue serving as expert reviewers. An example of such a policy might include the following language:

> *Following the adoption of revised standards, persons involved with conducting external QA reviews on behalf [name of EQAA} must undergo training on the rationale for the newly revised requirements, the intent of the new or revised criteria's language, and the expectations for implementation of the criteria for the HEI prior to being asked to serve as a reviewer.*

Note that such training can be offered in a webinar, face-to-face sessions, or through the reading of documents and completion of a post-reading quiz demonstrating a clear understanding of the "updates." It is up to the EQAA to determine the most effective way to provide the updated information.

## *6.3 Other Important Aspects of Safeguarding Functional Independence and Credibility*

Despite the best of intentions for EQAAs to structure their activities around the best practices related to functional independence, there will be times when the results of the review processes and/or the decisions made are called into question. For this reason, good practice further dictates that credible EQAAs offer both appeal processes and complaint procedures. Complaint procedures and appeal policies provide due process when an HEI believes that review procedures were not properly followed or when there is evidence that the conclusions drawn in the decision-making process either failed to include all of the information available or that a conflict of interest interfered with the decision-making process. In all cases, the grounds for the appeal and/or complaint should be in writing and any special panels created to handle the appeal should include membership that is acceptable to all parties. Furthermore, the members appointed to any special panel that may be created to handle an appeal or complaint process should be able to document that they have been free from influence on the review process just completed with no conflicts of interest that could interfere with regard to their own ability to impartially judge the merits of the complaint or appeal.

Once again, the call for EQAAs to offer complaint and appeal policies is included in the CHEA, ENQA and INQAAHE criteria for recognizing the good practices of such agencies. CHEA's recognition criterion 12.D.4 (page 7) [2] requires that institutions and programs be informed of "a specified and fair appeals process" that includes a description of the "process by which the appeal will be conducted, the grounds for appeal, and any costs associated with an appeal." CHEA also requires that the current accreditation status of the institution or program be maintained until such time

as a judgment is rendered on the merits of the appeal. Similarly, ENQA's ESG 2.7 (page 20) [3] expects EQAAs to clearly define complaint and appeal processes "as part of the design of external quality assurance processes" and to communicate these processes to the institutions. Lastly, INQAAHE's GGP Criteria 5.2 (pages 10–11) [4] require not only that the EQAA have "procedures in place to deal in a consistent way with complaints about its procedures or operations," but that the procedures be published and that "appeals [be] conducted by a panel that was not responsible for the original decision and has no conflict of interest."

## 7 Summary

The functional independence of an EQAA's operational structure and processes is the foundational cornerstone of credibility in today's global marketplace of higher-educational offerings. Essentially, functional independence relies on the EQAA's ability to demonstrate that its review processes are fair and consistently implemented and that persons who are conducting the reviews and making the decisions about quality are free from undue biases and have no conflicts of interest. The degree to which an EQAA can demonstrate and uphold the good practices relevant to assuring functional independence at every level of its reviews and decision-making processes is the degree to which there will be public confidence in the outcomes of the reported QA decisions. Public confidence in any nation's or region's QA requirements has become an important consideration as higher education institutions and their graduates have begun to cross borders.

Functional independence must, therefore, not only be safeguarded through the implementation of good practices as outlined in this chapter, but the good practices established through EQAA's policies and procedures should be clearly documented and made publicly available to all stakeholders. In particular, it will be important to develop and document the ways that the EQAA plans to avoid conflicts of interest in the appointment of and responsibilities assigned to governing board members, staff members, and/or any other external expert reviewers who may serve as a resource person for the EQAA (e.g. team members, special panel members) in areas related to (1) standards-setting; (2) decision-making; (3) review procedures conducted by staff and on-site reviewers; and (4) policy development.

Resources, such as the CHEA Recognition Policy, ENQA's ESG, and INQAAHE's GGP should also be regularly consulted as their criteria for the recognition of EQAAs that follow good practices provide high-level insight into the expectations that credible EQAAs enact.

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# Evolving Landscape of Global Higher Education: Challenges and Opportunities from a Graduate Education Perspective


**Karen P. DePauw**

**Abstract** Change is the watchword of the 21st century and universities must change to meet societal demands and expectations and to serve their public responsibly. As universities evolve within the global landscape, universities will experience both challenges and unprecedented opportunities. For success in leveraging the challenges and opportunities, the 21st century university must adopt a forward thinking approach; be adaptive, innovative and agile; foster interdisciplinary and integrative research and education; and become transformative. Graduate education is a critical component of the new modern university and transforming the system of graduate education can facilitate change in the university as well as to prepare the future faculty, scientists and administrators to lead the 21st century university.

**Keywords** Higher education · Graduate education · Change · Transformation · Interdisciplinary · 21st century university

## 1 Introduction

As the 21st century approached, the calls for change in higher education and institutional reform were frequent. One of the strongest and persistent voices was that of Dr. James Duderstadt, President Emeritus of the University of Michigan in his book entitled *A University for the 21st Century* [1]. He wrote that the "most predictable feature of modern society is its unpredictability" (p. 3) and named change, the challenge of change, and the challenge to change, as critical to the future of the university.

> Change will not only be the challenge to the American university, it will be the watchword for years ahead. With change will come unprecedented opportunities for those universities with the vision, the wisdom, and the courage to lead in the century ahead. (p. 10)

K. P. DePauw (✉)
Virginia Tech, Blacksburg, VA, USA
e-mail: kpdepauw@vt.edu



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_6

Although Duderstadt wrote primarily about U.S. institutions, his analysis and recommendations are relevant to universities around the world, not only for existing universities but also for colleges and universities that are emerging. In the years since the turn of the century, higher education around the world has been changing and continues to evolve. And the calls for higher education reform and transformation have continued to increase over the past decade.

Some of the world's oldest and most established universities are found in Europe. The history of higher education is long but the changes in higher education have happened rapidly. Significant among the changes to higher education was the establishment of the European Higher Education Area (EHEA) in the 1990s resulting in the Bologna Declaration [2] in 1999. The Bologna process initially included emphasis on mobility, "harmonization" across Europe, a common framework and common tools for the EHEA. Since then especially through the leadership of the European University Association (EUA), annual declaration, reports and documents have helped to improve higher education landscape across Europe. Among the recent topics for discussion and reports include internationalization through doctoral education, inclusion and diversity, teaching and learning, and open access. The significant success and satisfaction among the EHEA ministers resulted in the reaffirmation of the Bologna Process and the recent issuance of the 2018 Paris Communique [3] issued May 31, 2018. The Bologna process stands as a one example of the evolving landscape of higher education today.

In a recent publication, Barber et al. [4] issued a wake-up call and challenged the higher-education community and wrote that:

> deep, radical and urgent transformation is required in higher education. The biggest risk is that as a result of complacency, caution or anxiety the pace of change is too slow and the nature of change is too incremental. The models of higher education that marched triumphantly across the globe in the second half of the 20th century are broken. (p. 5)

Specifically, they argued that the traditional university is being "unbundled" through how outputs are measured (e.g., degrees, research); the individuals associated with the university and how they are described (e.g., students, faculty); how curriculum is determined, content packages, knowledge generated and learned; and how and when education is provided. While an exact future is not prescribed or known, the topics above and others must be addressed by new modern universities across the globe.

There are others [5–7] who have offered their reflections in less dramatic terms and yet still challenging universities to rethink and re-imagine higher education. Chubb [7] offered that we should "imagine":

- an educational system that sparked curiosity of students;
- a university system where lecturers engaged students in interesting ways to forming curious minds for variety of careers; and
- employers who could see the benefit of skills – critical thinking, creativity, analytical, logical and problem-solving skills – developed as part of an education in science whether or not they needed particular discipline knowledge.

Andrews [5] wrote about the importance of life-long learning and how the university must evolve. Carlson [6] addresses the issue of preparing students through

'systems thinking' for the complex society in which they will live and work. These clearly illustrate the importance of higher education and the underlying philosophy that education is a right. In 1948, the United Nations declared that education is a right [8] and a few years later, wrote that higher education specifically must be accessible to all [9].

Historically, especially in the United States, higher education was viewed as a private good in that those who could attend were those with wealth and privilege although the "university was established to benefit all of society – public good ([1], p. 28). Although the conversation has continued as to whether higher education is a private or public good, significant statements have been issued regarding higher education as a public good and particularly so for the 21st century university. In 2001, the EU ministers attending the EHEA annual summit in Prague issued the declaration considering the higher education a public good and a public responsibility [10]. In the United States a few years later, the Lincoln Project: Excellence and Access in Public Higher Education released its report entitled *Public Research Universities: Serving the Public Good* [11] confirming a university's role to serve the public good.

As a social institution with public responsibility to society, a 21st century university must prepare an educated and informed citizenry for life and work in the 21st century. A challenge to institutions of higher education is to prepare the highly skilled workforce needed for the increasingly complex global economy and for the jobs that don't yet exist and the changes in jobs and careers that these graduates will face in their lifetime. In addition, the university education must prepare current and future students to become actively engaged citizens and contributing members of a global society. To do so, universities must revisit core curricular content and experiential learning that will help students to foster critical engagement with knowledge, to recognize that knowledge is situated within broader cultural contexts, and to raise awareness of societal issues of inclusion, equity, and social justice.

There are many 'grand' challenges and wicked problems facing society today. The challenges and wicked problems are complex and address questions that go well beyond a single discipline and can only be solved through interdisciplinary and transdisciplinary collaboration and team science. Those who will solve these wicked problems must be "adaptive innovators" [12] which are more than the T-educated individuals but "pi" $\boldsymbol{\pi}$ educated.

In order to address the complex problems facing society in the 21st century and to serve the public good, universities must be forward thinking, namely adaptive, innovative, and agile; interdisciplinary, interactive, and integrative; and transformative. In preparation for changes in higher education, it is important to prepare our graduate students, especially the PhDs for the evolving higher-education landscape and to become the faculty members prepared for the roles and responsibilities of the new modern university.

> If lasting institutional reform is to be achieved, it will require changes in graduate education, with greater emphasis upon the integration of disciplines and their applications to societal issues. Preparation for leadership should be a part of graduate education… [1]

Based upon the writings of Duderstadt [1] and his call for a 21st century university, the Virginia Tech Graduate School's Transformative Graduate Education (TGE) initiative was developed and serves as a model of transforming graduate education and preparing graduate student to become faculty for the new modern university (21st century) and for work outside academia. The TGE Initiative was designed to be innovative, interdisciplinary, transformative, forward thinking and futuristic [13]. A description of this initiative and selected programs are here as examples of what is possible for universities particularly graduate schools to implement throughout the world.

The Transformative Graduate Education (TGE) initiative was designed as a framework to provide the foundation for truly innovative graduate education experiences for Virginia Tech graduate students. As shown in Fig. 1, the four pillars that guide the TGE initiative are knowledge, leadership, scholarly inquiry, and social responsibility. The unique programs, graduate courses and opportunities offered through TGE provide value-added to the disciplinary research, scholarly inquiry, and knowledge that graduate students receive in their academic units. Through the TGE experiences, graduate students are able to engage with interdisciplinary knowledge and scholarly inquiry as well as programs and opportunities to develop leadership skills and explore social engagement and social responsibility. TGE offerings also emphasize the application of innovative technologies, a commitment to excellence through inclusion and diversity, active civic engagement, and support for interdisciplinary research and education. These reach beyond traditional and discipline-specific degree programs and help build an inclusive and interdisciplinary academic community in a global context.

> TGE pushes the boundaries of traditional disciplinary academic education and provides the philosophical underpinnings for a truly innovative graduate education experience. TGE aims to significantly change how graduate students prepare to become the next generation of scientists, educators, scholars, engineers, artists, and career professionals in an ever-evolving global context. (Graduate School website 2018)


**Fig. 1** Virginia Tech Graduate School Transformative Graduate Education initiative

The Transformative Graduate Education (TGE) initiative offers a variety of graduate courses, graduate certificates, workshops, and programs. The VT Graduate School has created 'a space and place' for graduate education, a cultural transformation and new traditions. In alignment with the challenge to the 21st century university, the TGE initiative is innovative, agile, adaptive, interdisciplinary, and inclusive.

The purpose of the TGE initiative of the Graduate School is to better prepare VT graduate students to become global citizens and for whatever careers they pursue. The following outcomes were developed initially and remain relevant in assuring that students will be able to:

- conduct meaningful and innovative research and scholarly inquiry;
- work successfully in interdisciplinary and multidisciplinary settings;
- use innovative technologies in research, scholarship, teaching, learning, and engagement;
- apply scholarship to contemporary and global contexts;
- assume roles and responsibilities as faculty and career professionals;
- work successfully in diverse and global communities;
- utilize critical thinking and problem-defining skills;
- develop dynamic leadership skills;
- utilize collaborative and team approach; and
- understand and adhere to ethical standards and professional practices.

There are numerous graduate courses, programs and opportunities offered under the umbrella of Transformative Graduate education but only a few will be highlighted here. For more information, please visit https://graduateschool.vt.edu/transformative-graduate-education-experience/tge-initiative.html. Currently, the Graduate School offers academic credit courses on topics including the following:

- GTA Workshop (1);
- Academic Integrity and Plagiarism (2);
- Data Management Skills (1);
- Preparing the Future Professoriate (3);
- Contemporary Pedagogy (3);
- Topics in Interdisciplinary Research (1–3);
- Communicating Science (2);
- Citizen Scholar Seminar (3);
- Diversity and Inclusion for a Global Society (3);
- Preparing the Future Career Professional (3);
- Future Industrial Professional in Science & Engineering (3);
- Research in International Contexts (3); and
- Study Abroad – Future Professoriate: Global Perspectives (3).

These courses are available to all graduate students and can be used as part of their requirements for degree completion. In addition, students can earn a graduate certificate in the Future Professoriate.

Inasmuch as teaching and learning are critical to the 21st century university, the Graduate School offers education and training as a Graduate Teaching Assistant (GTA) through the GTA workshop, Contemporary Pedagogy course and the recently establish Academy for GTA excellence (GrATE). The Academy is open to all graduate students who have an interest in teaching/learning and provides workshops, seminars, "teach-ins", and resources. For more information, visit the website – http://vtgrate.org.

Universities today also have the responsibility for preparing masters and doctoral degree seekers for careers outside of academia and therefore, it is important to provide opportunities for current graduate students to develop the critical knowledge, skills and abilities necessary for success. In addition to graduate courses offered, there are many workshops, guest lectures, and even practical experiences throughout the year.

Communication and societal engagement are also critical components of the university today in serving the public good. Through the VT Graduate School, courses emphasizing communication skills (Communicating Science) and public engagement (Citizen Scholar) are offered. In addition, graduate students can be recognized for their work through the Graduate School's Citizen Scholar program. The Center for Communicating Science was founded to enhance communication not only for graduate students but for faculty and undergraduate students. The Center is an excellence example of a program critical to the new modern university.

As mentioned previously, interdisciplinary education and research must be an integral part of the 21st university. The Interdisciplinary Graduate Education Programs (IGEPs) provide an excellent model for bringing together faculty across departments and colleges to explore significant research problems while providing PhD degree options in interdisciplinary or transdisciplinary research for VT graduate students. The IGEP models allows for graduate students to enter the interdisciplinary research setting in one of the currently funded 14 IGEPs with an interdisciplinary team of scholars and ultimately graduate through an existing PhD programs. Current IGEPS focus on innovative and integrative topics including the following:

- Bio-Inspired Buildings;
- Biological Transport (BIOTRANS);
- Computational Tissue Engineering (CTE);
- Disaster Resilience;
- Genetics, Bioinformatics, and Computational Biology (GBCB);
- Human-Centered Design;
- Interfaces of Global Change;
- Macromolecular Science and Engineering (MACR);
- Regenerative Medicine;
- Remote Sensing;
- Sustainable Nanotechnology (SuN);

- Translational Obesity Research;
- Translational Plant Science (TPS); and
- Water INTERface: Interdisciplinary Research Transcending Boundaries of Engineering and Human Health (WATER).

For more information, visit the website https://graduateschool.vt.edu/academics/programs/interdisciplinary-graduate-education.html.

In preparation for careers of and for the 21st century, the VT Transformative Graduate Education (TGE) initiative provides an "opportunity for future faculty members and aspiring professional practitioners to explore a variety of pedagogies, research methodologies, and scholarly paradigms while completing their graduate degrees". Not only does the TGE approach fit nicely with the demands and expectations of a 21st century university, it provides opportunities to strengthen graduate education for the coming years.

> …it would be wise to acknowledge and understand the current and future challenges facing this system [higher education] and take steps now to ensure that it remains vital, adaptable, and relevant for many generations to come. To neglect graduate education, or to ignore threats to its success, puts the economic, social, and cultural well-being of the nation at risk. [14, p. 19]

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# Reform of Higher Education in the Arab World


**John Waterbury**

**Abstract** Because reform of higher education is inherently politically dangerous, with ramifications reaching well beyond the educational sphere itself, we must ask how policy reform might come about.

This contribution argues that change is occurring because it is largely crisis-driven. The best-known instances of painful reforms in the Arab world came in response to the structural economic crises of the 1970s and 1980s. Leaders at that time, and today, were willing to implement reforms that shattered social contracts because the alternative—business as usual—appeared to be even worse.

The impetus for educational reform is derived from the on-going economic crises. In particular reforms will try to respond to the dangerously high levels of unemployment, above all youth unemployment, that characterize the Arab world. The inability of Arab youth to find suitable employment is the result of an educational system characterized by outmoded pedagogy, insufficient public funding, and inappropriate training for the twenty-first century work place. It is argued here that leaders in the Arab world realize, above all after the uprisings of 2011, that this situation can be regime-threatening.

I explore the reform challenges under the following rubrics:

- governance and finance
- education for the job market
- quality assurance
- incompletion rates
- research/R&D
- regional cooperation
- information technology (IT)

**Keywords** Arab uprisings · Civil service employment · Demographic dividend · Education reform · Governance · Informal sector · IT · Job mismatch · Private sector · Public policy of reform · R&D · Top-down reform · Regional programs · Youth bulge

J. Waterbury (✉)
American University of Beirut, Beirut, Lebanon
e-mail: waterbury@aub.edu.lb



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_7

## Abbreviations

| | |
|---|---|
| AFD | Agence Française de Développement |
| AOU | Arab Open University |
| BAU | business as usual |
| CMI | Centre for Mediterranean Integration (Marseille) |
| EBRD | European Bank for Reconstruction and Development |
| ERF | Economic Research Forum (Cairo) |
| IFI | international financial institution |
| IHL | institution of higher learning |
| ILO | International Labor Organization |
| IMF | International Monetary Fund |
| IRCAM | Institut Royal de Culture Amazigh (Morocco) |
| IT | Information Technology |
| KPI | Key Performance Indicator |
| KSA | Kingdom of Saudi Arabia |
| LMD | license, master, doctorat |
| MENA | Middle East and North Africa (includes Iran but not Turkey) |
| NGO | non-governmental organization |
| PJD | Party of Justice and Development (Morocco) |
| R&D | Research and Development |
| RORE | rate of return to education |
| SME | small and medium enterprise |
| SSA | Sub Saharan Africa |
| WB | World Bank |
| WEF | World Economic Forum |

## 1 Introduction

> (This) Memorandum speculates that, even in the absence of changes to "the rules of the game" strictly speaking, informing the actors (enterprises, house-holds, and citizens) of the causes and consequences of the public policies adopted, sharing new concepts and ideas, and discussing the existing rules of the game may shift the equilibrium among the various components of the society and thus engender the desired change in the actors' positions (such as education reform). Increasing the level of knowledge, scaling up accountability and transparency and encouraging policy evaluation are three mechanisms that enable players to constantly revise their positions. [1]

The passage above is from a World Bank (WB) memorandum on Morocco, a country in which the World Bank Group has been particularly active. As I will develop below, the WB and other international financial institutions have not-so-subtly slipped in a range of political reforms under the guise of economic reform and restructuring. The Moroccan government, from King Mohammed VI on down, may be forgiven for sniffing some velvet revolution in the Memorandum.

Given the perceived and real political stakes involved in higher education, reform may strike political leaders as particularly dangerous. There is likely to be a strong preference for the status quo and business as usual (BAU) even if both are significantly dysfunctional.[1] That explains why so little real reform takes place even though a "crisis" in higher education is frequently acknowledged at the highest levels. The progress that has taken place has been uneven, often superficial, and more quantitative than qualitative.[2] Does it matter that progress is slow if the overall direction is toward best practice? The answer is 'no', but only if one is willing to write off all the students and faculty who are short-changed by the slow pace of reform and receive an inferior education or suffer through stunted careers.

Reform will come about through public policies. Even in systems where private education prevails (such as Lebanon), both the public and private sector are governed and regulated by public policies. We need to grasp the public policy process in the Arab world to gauge the likelihood of higher-education reform.

Where might one expect reforms? In this chapter we will give brief consideration to the following eight areas. They are by no means exhaustive, but they are either intrinsically important or areas in which reforms have been attempted.

- governance and finance
- education for the job market
- quality assurance
- incompletion rates
- research/R&D
- regional cooperation
- information technology (IT)

Of these, two are of paramount importance in terms of reform. Governance is of great significance because the main issue under it is enhanced autonomy. Institutional autonomy is the link between reform at the level of the system and reform at the level of the institution. Without autonomy an institution cannot undertake the internal reforms that would affect everything from curriculum to salaries, unless the reforms are centrally mandated and apply to all IHLs.

Any moves toward institutional autonomy, it is feared, will set precedents for the rest of civil society. Moreover, autonomous universities may be seen as offering one's foreign and domestic enemies privileged access to the nation's educated elites.

The second reform issue of exceptional importance is education for the job market. Inappropriate training is widely identified as one of the major failings of Arab higher education. It contributes directly to exceptionally high rates of educated youth unemployment. That in turn links the issue to an implicit political threat to incumbent elites, made manifest, perhaps, in the uprisings of 2011. It links the

[1] The status quo and BAU are not the same. BAU refers to process, the prevailing way of doing things while the status quo refers to a situation or a *rapport de forces.*

[2] UNESCO [2] finds evidence of some progress in the decade 1998–2008, but that progress was mainly quantitative, measured by the ratio of tertiary-level students per 100,000 inhabitants and the absolute number of universities.

issue, as well, to the broad and highly disruptive economic reform efforts underway in the region since the 1970s. The linkage of structural economic crises and educational reform have afforded points of leverage to the advocates of reform in the donor community and their allies in the domestic policy-making community.

## 2 What Do We Know About Policy-Making?

Policy-making in the MENA is opaque. That is part and parcel of autocratic regimes with very weak instruments of accountability. There are many academics, expert members of NGOs or IFIs, technical advisors, and public officials who do understand at least parts of the policy-making process but feel unable to comment on it in any detail. They are bound by political prudence or rules of confidentiality. For the rest of us outside the policy black box there is the risk of two major analytic traps. First we observe the outcomes of policies and then read backwards to assume that the policy's beneficiaries were responsible for its adoption. Our understanding of cause and effect may be off target. I fall into this trap below where I deal with the job mismatch. Similarly, as noted above, it is common to invoke crisis as the key variable in policy adoption. As a result, whatever context produces the policy is thus by definition one of crisis.[3]

The weakness of legislatures means that interest groups do not engage in lobbying of a kind common in western democracies but rather intervene directly with the executive to secure desired policies or ignore or bribe their way around laws and regulations after they are issued. In other words, stakeholders may influence policies *after* they are made, rather than before, by subverting or ignoring them. In this context there is no higher-education lobby in Arab states, let alone region-wide associations, that act as advocates for specific policies.

Weak accountability also means the scope of public debate of existing and new policies is limited. The media do not provide robust fora for the discussion and analysis of policy alternatives.

In contrast to weak legislatures, the donor/financial community and non-regional state actors play a major role in the policy process. Their leverage comes through the support they can offer in times of stress or crisis. That support may take the form of investment, financial lines of credit or military/security backing, or a combination of all three. The support is contingent on policies (sometimes maintaining the status quo, sometimes representing sharp departures) that these third-party actors deem desirable. These actors focus on policies *before* they are made, seeking to shape their form and substance.[4] They are generally alert to the distortions that may be introduced in the implementation phase.

[3] By way of example see Dreisback [3] on the introduction of e-government reforms in Tunisia and [4] Elmes on Tawfik Jelassi who became Minister of Higher Education and Scientific Research following the ouster of Zine al Abdine Ben Ali, and who undertook a range of structural reforms in education.

[4] They of course focus also on policies *after* they are made, such as removing long-standing con-

## 3 Top-Down Reform

Top-down reform is probably the only way reform will be initiated let alone sustained. As a counter-factual we can try to imagine what bottom-up reform would look like. It would involve much greater activism on the part of elected officials, parents groups, and coalitions of universities. Such activism is relatively absent in the Arab world. Far more significant are student, teacher and staff unions, but they usually become ferocious defenders of the status quo, not of reform.

It is easy to assume that weak accountability affords authoritarian leaders the ability to make unpopular decisions and to take bold action. But weak accountability is a two-edged sword. Along with bold action, leaders may prefer to remain relatively passive even in the face of discontent or immanent crisis. In the education sphere, as in others, weak accountability in the Arab world is as likely to lead to inertia as to bold action.

That said, few leaders are indifferent to unemployment rates running around 12% of the eligible workforce and reaching 29% among the educated (secondary or higher). It is a long-term crisis that leads to periodic bursts of violence but is manageable in the short term through brain drain, the quiet tolerance of huge informal sectors that provide precarious, low-skill employment, and the creation of fictive jobs in the public sector. But these 'solutions' do not obviate the long-term erosion of political legitimacy that unemployment causes.

So leaders do act, and reformers try to get their ear and persuade them of a given course of action.[5] So do third parties in the donor community. There was a long era, not yet over, in which Arab authoritarians, at least in the oil-poor, labor-rich countries of the region, broke sharply and repeatedly with business as usual (BAU). It involved the "fiscal crisis" of the Arab state first manifest in the 1970s, and recurring periodically in the decades since then. Leaders dismantled long-standing social pacts, narrowed their coalitional support, and surrendered some of the levers of state control over their economies. There was plenty of popular protest during these decades, but the leaders adopted policies of change more in response to the pressure of the donor community than in response to their own people.

Fiscal crises drove the policy change process. Leaders were faced with untenable situations in the short term. Their nations' credit ratings were being periodically

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sumer and fuel subsidies.

[5] Rahman, Atta ur [5] got the ear of Parvez Musharref who had seized power in Pakistan. "As the Federal Minister of Science & Technology in 2001, I persuaded the government to increase the development budget for science by about 6000%. The abolishing of the University Grants Commission and the establishment of the Higher Education Commission in 2002 as a powerful new national body on higher education that was headed by a person with the status of a Federal Minister and which reported directly to the Prime Minister of Pakistan marked a new chapter in the history of higher education in Pakistan".

Mohammed Cherkaoui, one of Morocco's leading social scientists, lamented the misaligned incentive system and low research output in Morocco's higher education system and concluded that only the King could bludgeon through reforms to address the situation [6] (interview October 30, 2013).

downgraded, creditors and investors reduced their exposure, public expenditures were covered by printing money, inflation surged and debt-servicing along with it. Stop-gap measures, such as lifting select consumer subsidies, succeeded only in arousing popular anger without solving the structural problems. The fiscal crises forced open the door to the entry of the private sector into university education. It led to or accelerated the decoupling of university education from public sector employment.

It can be reasonably argued that the Arab uprisings of 2011 grew out of the slowly evolving fiscal crisis and the abandonment of social contracts, but the cause and effect are not clear [7]. Whatever the causes, the uprisings represented a full-blown crisis that led to regime change and civil war. The status quo and BAU were shattered in some countries (Egypt briefly and Tunisia) but not in others such as Algeria, Jordan, Lebanon, the KSA, Sudan, and to a lesser extent, Morocco.

The Arab uprisings of 2011 were not about education per se, but they destabilized systems to the extent that a certain range of reforms, such as electing university presidents and deans, became possible. The window shut pretty quickly.

In Iraq, Syria, Libya, and Yemen, the physical infrastructure of the educational systems has been badly damaged or destroyed. To rebuild will entail both institutional and physical reforms.

If we begin to hear the slogan "build back better", beware. The example of Haiti after the January 2010 earthquake should show us how hollow that phrase can be. Nowhere have the uprisings triggered structural reforms in higher education. The old maxim, "never let a good crisis go to waste" in this instance is likely to be ignored.

## 4 Third-Party Leverage

The reform process has been driven significantly by outside actors armed with money and expertise. They are the usual suspects: the World Bank Group, regional development banks, bi-lateral aid agencies, and occasionally foundations and NGOs (the latter often have expertise but not equivalent financial leverage).

These institutions have exploited the economic crises of the 1970s and 1980s to involve themselves in human-resource formation in the broad sense and in education at all levels. The focus was and is on unemployment, the over-staffing of the public sector, and the stimulation of the private sector. The economic reforms, inspired by the so-called Washington Consensus, earned the epithet "neo-liberal" and so did the educational reforms [8–10]. For many, if not most, intellectuals neo-liberal reforms were seen as a perversion of the mission of higher education; its 'commodification' and its 'corporatization' inter alia [11].

In parallel, European universities were entering the Bologna Process (1999) to develop common standards and procedures, including accreditation, to encourage student and faculty mobility among European universities. The Bologna Process led to the establishment of the European Higher Education Area. Turkey joined it in

2001 [12]. The EU sought links with universities in the MENA through exchanges, joint degree programs, and research. Tentative but so far ineffective steps have been taken to create an Arab Education Area. This would involve establishing degree/diploma equivalencies, setting benchmarks against which to measure performance, and perhaps moving toward regional accreditation mechanisms [13].

There are two European third parties that warrant special mention: Tempus and the CMI. Tempus describes itself as the European Union's program to support the modernization and reform of higher education in the EU's surrounding area, especially in the partner countries of Eastern Europe, Central Asia, the western Balkans, and the Mediterranean region. It aims to promote voluntary convergence of the higher education systems in the partner countries with EU developments in higher education.

The Tempus program is implemented in close coordination with the Erasmus Mundus program which provides scholarships to third country students allowing them to participate in top-level master courses and doctorate programs (extracted from the Tempus web site: http://eacea.ec.europa.eu/tempus/).

The Center for Mediterranean Integration (CMI, Marseille) [14] was founded in 2009 and has several public policy foci. One is centered on education and reform: advancing university governance reforms, quality of technical and vocational skills, youth entrepreneurship, and innovation. The CMI enjoys support from the WB Group and the European Investment Bank. Several bi-lateral aid agencies are partners, such as the AFD (Agence Française de Développement).[6]

## 5 Morocco

Morocco illustrates well the role of external actors in the reform process as well as the considerations lying outside the educational sector that may move reform along. Relative to other Arab states, Morocco has been a vigorous reformer at all levels of education. At the same time, it has been something of a laggard in terms of basic socio-economic indicators such as literacy levels, female participation rates, and (in)equality of income distribution.

Morocco's King appoints the government. He is directly responsible for security, defense, the judiciary, and religious life. He supervises but is not directly responsible for the ministries involved in social and economic policy, including education. Therefore he can criticize those whom he has appointed without implicating himself. King Mohammed VI has often been unsparing in his criticism of educational and other reform efforts, noting their failure to reach their self-proclaimed goals. For example in his Speech from the Throne in July 2004 he set 2010 as the deadline for "reaching quality education". The Plan d'Urgence of 2009 signaled that that goal was receding. Even the mass demonstrations of February 2011 did not galvanize the reform effort,

[6] Libya, Algeria, Syria, Spain, Turkey, Cyprus, and the Balkan states are not members of the CMI.

and in 2013, in his Speech from the Throne, Mohammed VI talked of certain (university) specializations being factories of unemployment (see below).[7]

The experience of Morocco since 1983 provides a representative example of the role of third parties in promoting educational reform. In that year, Morocco entered into a structural adjustment program to correct macro-economic imbalances. One of the main economic reforms was to contain public spending and to lower the deficit. The WB and the IMF identified the public sector wage bill as one of the problems [8, 16]. Early retirement programs were implemented across the civil service [17, 18].

The adjustment process led to a reduction in outlays on education of 11% between 1983 and 1989. It was accompanied by a program to deregulate and privatize parts of the education system. A series of reform programs was launched beginning in 1999 with the National Education and Training Charter, followed by the Education Emergency Program of 2009–2012 (le Plan d'Urgence) and the Education Action Plan of 2013–2016. By this time Morocco was led by the moderate Islamist party, the Party of Justice and Development (PJD) under Head of Government, Abdelilah Benkirane. He was clearly comfortable with the spirit of neo-liberal reform. Speaking in November at the 50th anniversary of the African Development Bank (ADB), he declared that "it is time that the State withdraws from certain sectors, such as healthcare and education and that the role of the state should be limited to assisting private operators who want to engage in these sectors."

In terms of governance, there was the move to strengthen the universities' corporate identity including their right to invest in or create private enterprises. They were linked to Morocco's 17 regions in order to promote regional development and employment. University Councils included the presidents of regional councils and the presidents of the regional council of ʻulema (Muslim religious scholars), and seven representatives of regional economic and social sectors. From the university there was the university president, three faculty, and three student representatives.[8]

In the spirit of greater corporate identity, in-coming presidents were to be selected on the basis of 4-year plans for the university. The successful candidate could expect his/her plan to be the basis of a contract between the government and the university for the requisite level of funding.

The World Bank Group and allied third-party institutions mobilized substantial resources both for structural adjustment and for education reform. The graph below illustrates the leverage these entities can exert on the reform process (Fig. 1).

More specifically, the World Bank has mobilized two education-sector loans worth in total $200 million. It is important to note that they focus mainly on pre-university education. The first loan (Educational Development Policy Loan 1) boosted coordination between key ministerial departments, and contributed to better use of Government resources through improved coordination among donors, aimed at maximizing the benefits of technical assistance enhancing strategic plan-

[7] The most recent iteration in the chain of educational reform documents is Kingdom of Morocco [15] prepared by the Supreme Council of Education.

[8] Most assessments find these councils as underperforming due mainly to the absenteeism of the non-university members.

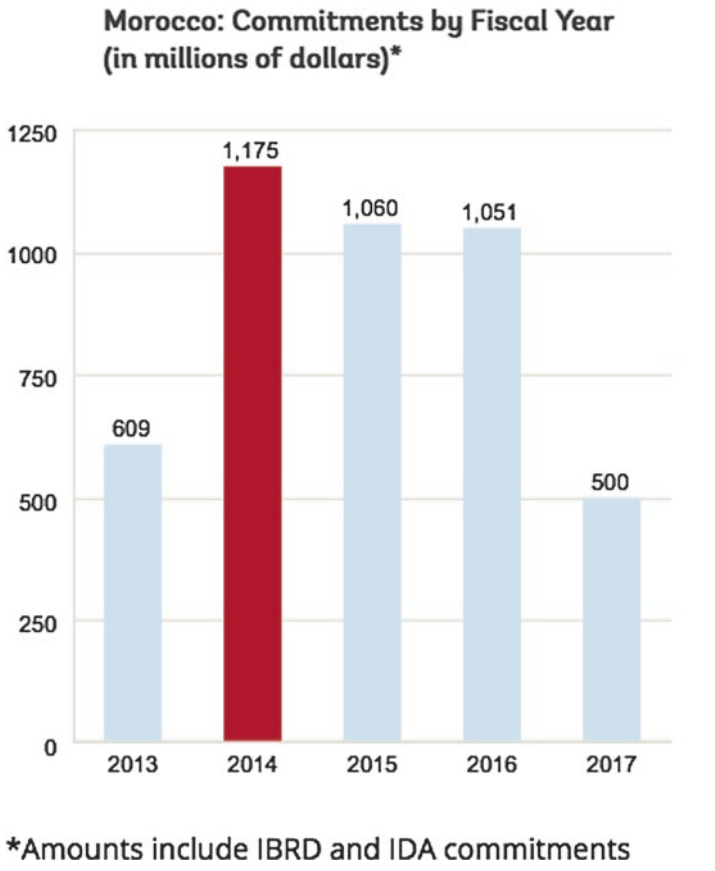


**Fig. 1** WBG Total Commitments to Morocco: 2013–2017. (Source http://www.worldbank.org/en/country/morocco/overview)

ning. EDPL1 was in support of the Plan d'Urgence, 2009–2012. The WB Group helped mobilize other supporters: the African Development Bank, the European Investment Bank, the European Union, the French Development Agency, and the Spanish International Cooperation Agency for Development [19].

The same institutions came forth with follow-up support for the period 2014–2017. The WB Group committed $100 million to the Education Quality and Governance Loan and another $50 million to support small and medium enterprises (SMEs), the hoped-for source of job creation for all levels of education.

One component of the structural adjustment support involved an early retirement scheme for the entire civil service, which went into effect in 2002. Some 39,000 civil servants took advantage of it. It was extended to university faculty as well. Full-time university faculty declined from 12,689 in 2002 to 12,194 in 2006 [17, 18]. Substantial bonuses were paid to those taking retirement. The impact on

university faculty, according to Mohammed Cherkaoui [20], was negative. The best trained, bi-lingual, professors, frequently in law, architecture, and economics, with good job prospects outside the university, left. Academic production in some disciplines dropped sharply. The losers stayed behind. As with other reforms, Cherkaoui lamented, there was no pre-reform testing, just moving ahead full bore.[9]

In 2001, Morocco decided to adopt the so-called LMD (*license*, master, doctorate) structure of higher education that emerged out of the Bologna Process in 1999 and spread throughout the EU. Morocco began implementation in 2003/2004 and was joined at roughly the same time by Algeria, Mauretania, Tunisia, and Lebanon. The structure is inspired by "Anglo-Saxon" practice. It introduces the semester system and credit hours. It sets the requirements for the undergraduate degree (*licence)* at six semesters or 3 years, the masters at four semesters or 2 years, and the doctorate at six semesters.

The structure was to be characterized by rigorous standards of frequent student evaluation. Institutions would have a certain leeway in designing the structure of degree programs and curricular content, subject to central evaluation to measure equivalency.

A major objective was to harmonize higher education with European practice thereby enhancing student and faculty exchanges and, to some extent, shared research. I am not sure why the LMD reforms have been limited to institutions in the region with a strong francophone background when the inspiration came from North America.

It is safe to say that implementation of the LMD reform met with considerable resistance just about everywhere. It involved a brutal shake up of BAU, placed major demands on faculty to re-write and re-structure their offerings, and probably raised the quotient of supervisory work substantially. In Morocco, Mohammed Cherkaoui [20, 21] characterized it as a disaster. Like the early retirement program, it was introduced without trials and testing. While he one cannot claim cause and effect, the proportion of part-time faculty in Moroccan universities shot up. Significant reforms seldom go smoothly (one reason why leadership prefers inaction), and the LMD system may one day prove its worth, but we are still very much in the "sea trial" phase.

Political agendas only tangentially related to education can and do produce reforms of considerable significance. It has long been a well-known feature of the Moroccan monarchy's effective political control to encourage a certain amount of division between those Moroccans identifying themselves as Berber and those who emphasize their Arab and Islamic origins. Rather then suppress these identities, the Monarchy celebrates them and plausibly claims to incarnate both. King Mohammed VI, soon after inheriting the throne, issued a decree (*dahir)* on October 17 2001, creating The Royal Institute of Amazigh Culture (IRCAM). By 2004, Morocco's three Berber dialects were being taught in the schools of the Berber regions. The

[9] Mrabi [18] shows that over the period 2007–2013 new hires in the civil service far outnumbered retirees: 128,986 new hires vs ca. 50,000 retirements. About 35% of all new hires were in education of all levels which is to be expected for a sector in full expansion.

*tifnagh* script was officially adopted as the alphabet for Berber. IRCAM signed agreements of co-operation and collaboration with the Ministry of Education to further develop the teaching of the Amazigh language and culture. The universities of Agadir, Fez, and Oujda have each created a Department of Amazigh Studies to improve the teaching and the learning of both the Amazigh language and culture [22, 23].[10]

Similarly, the creation of Morocco's 17 regions, and the place of regional universities in them, was in part driven by Morocco's claims to the former Spanish Sahara going back to 1975. Morocco's annexation of that region has not been fully accepted in the international community. It is bitterly contested by next-door Algeria. Regionalization in Morocco is partly designed to make the Western Sahara look like just another Moroccan region. Like the official blessing of the Berber languages and cultures, regionalization has had potentially profound effects on higher education.

There are solid indications that Morocco sees its way forward as being a kind of Singapore West. It aspires to become a trade and educational corridor between Europe and Sub-Saharan Africa (SSA). Morocco invests about $500 million a year in SSA, focusing on renewable energy, IT, agriculture, and manufacturing. This engagement is about a decade old [24]. At the same time, Morocco is trying to lure European capital into manufacturing platforms that can export to SSA, the Middle East, and Europe. The automotive, aeronautic, and solar sectors are already substantial in Morocco [1].

In terms of education, Morocco, it is hoped, would become a pole of attraction for West-African students (French would be a kind of lingua franca and Islam a spiritual and cultural bond). Special training institutes and research ventures, funded by Europeans, would assure a supply of relatively low-cost, highly skilled Moroccan employees to the manufacturing joint ventures. As Lahcen Daoudi, former Minister of Education and member of the PJD, saw it, this kind of education could have a strong appeal for the 52,000 Moroccans studying abroad (as of 2013), bringing them and what they spend on fees back to Morocco. Morocco had and has a chance to get a leg up on its competition [6]. Like the head of government at the time, Abdelilah Benkirane, Daoudi saw education reform as a business proposition: "le Maroc se vend bien" (Morocco sells well), he said to me.

Morocco's strategy would offer political dividends as well. It could be sold as helping to stem the flow of refugees across the Mediterranean to Europe and to shrinking the field for extremism. Morocco could also curry favor with its African neighbors for its claims to the Western Sahara. Reform is often helped by pay-offs in other areas.

I quoted Jean Pierre Chauffour (World Bank senior economist) at the beginning of this chapter to indicate the far-reaching political implications of education reform. As he was writing about Morocco, I will end this section with excerpts from Chauffour that I suspect set eyes rolling in Rabat. First he sketches out a kind of crisis. At current rates of change, he warns, it will take 50 years for Morocco to

[10] Article 5 of Morocco's 2011 Constitution makes *amazigh* an official national language.

"converge" with the economies of southern Europe. Morocco must accelerate and boost its productivity growth substantially.

"Place education at the heart of development. For the education reform to be effective, it will have to be realistic and selective. It should tackle major constraints in a "shock therapy" approach designed to trigger an "educational miracle," that is, a huge improvement in the Moroccan students' level of education. This would require a complete overhaul of the education system, improved teacher recruitment and training, the adoption of a new brand of public school governance, the development of alternative educational options (charter schools, school vouchers and home schooling), and the promotion of twenty-first century skills" [1].

Chauffour then takes on the "system" as a whole [1]:

> For example, the behavior that hampers free competition and the country's economic openness by protecting special interests and maintaining nepotism and rent-seeking is often *rooted in the players' history, culture and way of thinking* (emphasis added). Those within the system who benefit from its protection find it normal that so many others should be deprived of it.

It is rare for third-party experts to be so blunt. The preferred route is to couch reform in bland and neutral terms that imply that reform can be reached through existing institutions and practices without any abrupt challenge to BAU. Talking of "shock therapy" to the host government is certainly bold and probably foolhardy.

## 6 Governance

The basic trends in governance and governance reform, and the political dangers contained therein, have been reviewed in Waterbury 2016 [25]. Here a few summary remarks will suffice. The linkage of economic reforms to education reforms means that progress, albeit slow, towards greater institutional autonomy is underway. If its progress does not shake the rest of the system, then political leaders may not impede it. As a result there is some cautious optimism among various experts in the education field.

> In summary, the emergence of national quality assessment agencies and the switch from 'line-item' to lump sum budgets accompanied by the strengthened role of the university head and the increased discretionary powers given to the central administration of the institution represent basic features of what characterizes the transformation from the regulatory to the evaluative state [12].

"It is likely that the Arab Spring will certainly affect the governance system of higher education, probably in the direction of more independence, participation and partnerships," said Rajika Bhandari, deputy vice president of research and evaluation at the Institute of International Education [26].

The sad fact is that with a few partial exceptions (Tunisia, Morocco, Jordan) the Arab uprisings have resulted mainly in the reassertion of authoritarian controls, physical destruction of much educational infrastructure, and in the case of Turkey after the 2016 attempted coup, sweeping purges of university faculty and administrators.

## 7 Education and the Job Market: The Great Mismatch

There is now an extensive literature on the "youth bulge", the "demographic dividend", "wait hood", and the educated unemployed (in the Maghreb *les chômeurs diplomés)* in the Middle East [7, 27–33]. What should be a great opportunity for the region is instead turning into a political time bomb. Fertility rates in the region, once among the highest in the world, have been trending downwards for a couple of decades. In Iran, the fertility rate is below replacement; that is, the average couple is having less than two children over the mother's child-bearing age. The result is that the baby-boomers of the earlier decades are entering the work force in unprecedented numbers (the youth bulge). Their presence has reduced the "dependency ratio", the number of people outside the workforce (mainly the young, the old, and those doing unremunerated house work) to low levels. That fact should produce the demographic dividend—an abundant, educated workforce with relatively few dependents to support. The economies of the Middle East have the opportunity to ride this favorable dependency ratio to higher and sustainable growth and prosperity.

It is not happening. Outside the oil exporters, economic growth has stuttered. Regional turmoil since 2011 has been a factor, but the basic statistics before and after 2011 do not differ much. Overall unemployment seems stuck at over 10% in most countries while youth unemployment averages 24–25% of the relevant cohorts. Women's participation rate as a proportion of all eligible women seldom exceeds a third. Even Turkey, in relative terms a star performer with the world's 18th largest economy, and not benefitting from petroleum rents, has an overall unemployment rate of 10% and a youth unemployment rate of 19%. Its female employment rate is about 33%. The ILO estimates that youth unemployment will keep rising, reaching 29.1% in the Middle East and 30.7% in North Africa by 2019, whereas the peak rate in other world regions will not exceed 18% [32]. All this speaks to the fact that unemployment in the MENA is structural in contrast to the more advanced economies where it is cyclical.

The Kingdom of Jordan was not alone in underlining the severity of the problem [34]:

> (O)ver many years the progress of education in Jordan exceeded other countries in the region, in both quality and quantity. Over recent years, however, that progress has stalled, and our education system is no longer producing the results the Kingdom needs. There is an oversupply of university graduates and chronic undersupply of skilled craftsmen and technicians. As a result, youth unemployment is running at 31.8% and total workforce participation is only 41%, one of the lowest rates in the world.

The report then suggests KPIs on youth unemployment that are striking by their modesty: the unemployment rate among university graduates in 5 years is to go down to 24% and in 10 years to 20% [34, see also 35].

It bears stressing that the great majority of unemployed youth have had at least a primary-school education. Everywhere, youth unemployment is inversely correlated with level of education although university graduates are somewhat more

likely to be employed than high-school graduates. The basic trope is that once the public sector had sated itself on high school and university graduates, it fell to the private sector to take up the slack. But, so the story goes, the private sector found the products of the education system unsuited to its needs, hence the mismatch. Once again, the MENA is not alone,[11] and after the crash of 2008 a number of southern European economies spawned unemployment that looked much like that of the Middle East. But the region's problem appears more deep-seated, persistent, and resistant to reform.

The job skills mismatch is twofold. Formal sector employers allegedly cannot find the type of employees they need. The informal sector, that vast grey economy beyond the tax collector and state regulation, soaks up educated and uneducated youth in low-skill, low-tech jobs. The educated are over-qualified for the work they find in the informal sector. On average, the informal sector absorbs about 40% of all new entrants to the job market, the public sector 25% and the formal private sector around 10%. The remainder are unemployed. The informal sector is where many young Middle Easterners spend their "wait hood", i.e., the time between graduation and finding a suitable formal sector job. At the time of the uprisings, wait hood averaged about two years in a number of Arab countries. Many of the unemployed are holding out for employment in the public sector where the wage levels are higher for similar kinds of work. The better-off are more able to wait than the poor. The latter are forced to settle for lower paying jobs in the informal sector. But it is also the case that after age 35 unemployment drops sharply as many of those holding out for public and/or formal sector jobs are forced to accept whatever work is available to them (Ragui Assaad email, Nov. 27, 2017; [37–39].

In contrast to the 1970s and 1980s when the demand for higher education graduates was strong, above all in the civil service and the rapidly expanding education sector itself, it is now the case just about everywhere that the returns to higher education are diminishing [31, 40–43].[12] According to Tzannatos et al. [40, p.3] (see also [44] on Syria) "the general picture that has emerged so far is that RORE (rates of return to education)[13] in the MENA are:

- Lowest compared with other regions, with an additional year of schooling adding around 5.4% to labor earnings compared to a world average of 7%
- Particularly low for secondary education (3.5%) followed by tertiary education (8.9%); both are almost half the respective world averages (6.9% and 16.9%)

[11] The Economist [36] notes that in advanced economies, early in the millennium, "35–40% of surveyed employers indicated that they had trouble finding qualified hires. The fields that had inadequate supply are all what universities purportedly produce: technicians, sales reps, skilled trades persons, engineers, management, IT staff, etc."

[12] Tunisia has taken the dramatic step, beginning in 2017, to freeze public sector hiring and to begin laying off up to 50,000 civil servants by 2020, in conformity with the conditions of an IMF loan.

[13] RORE are typically reported as percentages, for example, a value of 5% implies that a worker with an additional year of schooling earns that much more than an otherwise identical worker who has 1 year less education.

- High for primary education (9.4%) which is almost equal to the world average (10.3%)
- Higher for women than for men (nearly 8% versus 5%)
- Higher in North Africa/Maghreb than in the Middle East.

RORE are typically reported as percentages, for example, a value of 5% implies that a worker with an additional year of schooling earns that much more than an otherwise identical worker who has one year less education.

The causal argument they advance goes to the heart of the political regime (p.18):

> Under the traditional "social contract" the population (or, at least, part of it) exchanged political freedom in return for public sector jobs (as well as free public services, low taxes, subsidies and other state handouts). This is the cause that, apart from resulting in low quality services that required few real qualifications on behalf of public sector workers, it (sic) created low incentives for families and individuals to invest in education beyond the point of credentials. Getting employment became a matter of entitlement rather than a privilege to be earned through merit, effort and productive service. Under these conditions, the quality of the education output is low resulting in workers having low productivity. This pushes the demand for labor down giving rise to low returns to the acquisition of additional education.

The Arab world has unusually high rates of brain-drain [45]. The continued investment by students and parents in tertiary education may reflect the inclination of the region's educated youth to go abroad for employment (where the RORE will be much higher [46]. The phenomenon is old. In the early 1980s, it is estimated that half of all Arab PhDs had left the region and that only two of every five Arab researchers were working in the region [47]. Three decades later, it was estimated that Algeria had 22,000 'researchers' working in-house while 40,000 were abroad [48]. The AHDR of 2016 attributed brain drain to the exclusion of youth in Arab society and to the "barriers of patronage, wasta, nepotism, and autocratic controls". Over time, the willingness of tertiary graduates to emigrate has grown enormously from ca. 20% 20 years ago to over 60% in 2015 (pp.155–56). In 2010, 62% of Jordanian migrants abroad were university graduates. All Arab countries, the Report claims (p.161) promote such migration to varying degrees for political and economic reasons.

We have seen how Morocco intends to address this problem through business partnerships with Europe aimed at supplying African markets. The goal is to bring innovative education to Moroccans and Africans in Morocco, and then provide graduates appropriate work opportunities. Jordan has adopted a much more radical approach albeit one that can only address a small part of the problem. It is considering establishing an advanced polytechnic school aimed at graduating skilled students from all over the Arab world whose ultimate destination would be the skilled labor market in Europe. The logic is that the demographics of Europe's aging population favor this sort of export. If the local markets for educated talent are evolving slowly, then brain-drain by design may relieve some of the pressure [49].

The destabilizing effect of the mismatch has been evident for some time. To provide something like 16 years of education to young Arabs (male or female) and then leave them without meaningful or appropriate employment gives them every

incentive to attack the "system" [50]. In one of the more thorough empirical studies of the causes of the Arab uprisings, Campante and Chor [51] asserted that the low returns to education have a direct political effect: an unemployed or poorly employed youth faces a low opportunity cost in engaging in political protest. They do not have much to lose. They concluded:

> Taken together, these different pieces of information build a narrative that suggests that the combination of rising levels of education and poor job prospects — particularly for the relatively skilled — was present in the Arab world, and particularly so in those countries that have witnessed the Arab Spring in its fullest bloom.

To the frustration of educated job seekers must be added the likely frustration from two other quarters. First, we have the cohorts over age 35 who abandon their quest for formal sector, preferably public employment and accept work for which they see themselves as over-qualified. Then we have the parents of the contemporary unemployed or poorly-employed. This older generation was and is heavily employed in the public and formal sector but sees its educated offspring fighting to survive in a poorly paid, low-tech, unregulated informal sector. One may hypothesize that current job-market dynamics produce a political protest trifecta.[14]

The uprisings of 2011, even in countries that were relatively spared (Morocco, Algeria, Jordan), elicited measures to address employment, productivity, and innovation. Morocco created over 4000 new civil service jobs to satisfy a few of the *chomeurs diplomés*. It earmarked over $60 million to support "innovation centers", R&D, and business-university partnerships. The General Confederation of Moroccan Businesses pledged to support the effort through "special training contracts, developing apprenticeships, building better bridges between enterprises and universities, involving businesses in career guidance for students, and special conversion training for graduates in subject areas with no economically viable openings." [48].

In 2018, the Moroccan government (President of the Government, Sa'ad al Din al 'Uthmani) signed a "charter with the General Union of Moroccan Enterprises to create 1.2 million new jobs over a period of 3 years [52].

The flurry of reforms initiated in 2011 failed to transform the basic problems. By 2013 King Mohammed VI was back in his bully pulpit, chiding his own officials (August 20, 2013):

> In contrast, it is entirely different for the graduates of certain university disciplines. In effect, and despite the praiseworthy efforts furnished by university *cadres*, these (disciplines) must not become factories of unemployment, above all in certain out-of-date specialisations.

Jordan had begun its own efforts in 2003 when it launched its Faculty for Factory program at Jordan University to "engage academia and industry in structural assistance programs for their mutual benefit." The focus is primarily on SMEs, and

[14] This analysis is hypothetical, at best a surmise from employment data. I am not aware of survey data that would confirm the hypothesis of these three sources of frustration. The employment data merely suggest that such frustration is plausible.

expert faculty are to provide diagnostics and project designs to strengthen private enterprise. It fields currently over 80 academics, mainly in engineering, from nine Jordanian universities. The great majority still come from Jordan University and the Jordan University of Science and Technology (summary provided to me by Dr. Yousef Al Abdallat, the Program's Director at JU). The program, according to some close observers, has not worked well. Professors do not actually help solve problems. They are chiefly interested in the salary and the ability to generate publications from their work [53, 54].

At the time of the uprisings, Jordan, under the auspices of the King Abdullah II Foundation for Development (KAFD) started a student-centered program called DARB, the University Summer Training Program, to acclimate students to work in the private sector and to afford them practical training. The first cohort of 388 students was placed in the summer of 2011 and by 2015 some 2800 students had benefited from DARB. Subsequently 324 were offered jobs [55] (I am grateful to Rasha Faek for alerting me to DARB).

Saudi Arabia has seen three episodes of top-down reform. Rather than embracing inaction, Saudi leaders acted decisively in all three instances. In 1979, the Kingdom was shaken by the overthrow of the Shah in Iran and the founding of the Islamic Republic under Ayatollah Khomeini. This was followed by the seizure of the Grand Mosque at Mecca by radical Saudi Islamists. Under this double threat to the legitimacy of the House of Saud, then King Fahd unleashed the most conservative forces of Wahhabi Islam, rolling back de facto women's rights, upping the religious content in all phases of schooling, and re-enforcing the rights of Saudi men to control the lives of female family members.

These were decisive reforms albeit negative ones in the eyes of many. Several years later, in 2005, Abdullah became King and began to roll back the reforms introduced by Fahd. He sent tens of thousands of young Saudis abroad for education, began to pry the education system loose from the control of the Wahhabi *ulema*, and he capped it off with the founding of the King Abdullah University of Science and Technology which admitted Saudi women to its graduate student body.

There was a delayed reaction in the KSA to the uprisings of 2011. The immediate response was to raise civil-service salaries and hire more recent university graduates. The reform agenda began in 2016 with the launch of the Vision 2030 under the auspices of Deputy Crown Prince, Mohammed Bin Salman who was made Crown Prince by his father King Salman, in June 2017. The Vision 2030 focuses on Saudi Arabia's post-petroleum future. Among its major goals is reducing Saudi Arabia's overall unemployment rate of 13%, strengthening the private sector through privatizations, and linking education to the job market [56].

The job mismatch is usually measured in terms of private-sector employers' dissatisfaction with the skill-set university, vocational, and high-school graduates bring to work. Too many graduate in the humanities or social sciences and too few in the STEM disciplines.[15] Masses of graduates come out of diploma mills like Egypt's

[15] In Egypt 80% of tertiary grads are in the humanities/ social sciences while in South Korea and Iran it is more like 40%. Tunisia is around 50% [57].

"commerce" (*tijara*) faculties. While the graduates nominally have business degrees, they are quintessential products of the culture, "you pretend to teach us, and we pretend to learn". University graduates reach the job market without critical thinking skills, experience in problem-solving, or training in citizenship skills [58].

The private sector, however, has a lot to answer for (for useful surveys see [32, 33].[16] For decades, in the 1960s through to the 1980s, it was repressed and discouraged in many Arab states. Its natural refuge was the informal sector, rent-seeking behavior, and quick profits. That era was succeeded by the structural adjustment phase when, all too often, regime "cronies" in the private sector got inside deals on under-valued privatizations, state contracts, monopolistic licenses, and the like. The Alawi-minority regime in Syria captured a significant part of the Sunni capitalist class in Damascus and Aleppo in this manner. Cronyism became the glue of what we now know was a dysfunctional political system.

Even in the more market-friendly era the private sector has been most comfortable in sectors with quick returns such as real estate, tourism, the financial sector, or in sectors that do business with the state. Morocco, which has an old and experienced capitalist class and which has always been market-friendly, nonetheless looks, in terms of unemployment, much like the more populist regimes of the region.

The most dense domain for private economic activity is the informal sector where private entrepreneurs can evade the heavy regulations and fiscal reach of the state. I noted above that the informal sector is by far the major source of private-sector employment. Education reform without an overhaul of both the formal and the informal private sectors will be like one-hand clapping.

Once the civil service is saturated, university graduates turn to a private sector that in many instances does not need them. As we shall see, the Middle-Eastern private sector is not heavily invested in STEM areas (in contrast, say, to Israel), and it invests relatively little in R&D. The financial sector of course needs graduates with business training, all institutions, public or private, need IT support, but the tourism sector (which by its nature is employee-intensive), outside the ranks of management does not really need university graduates. Universities may have failed the job market, but the job market has also failed the universities.

There is imperfect congruence in the views of political elites and private-sector employers on the nature of the challenges but there are also significant differences. The eight-country survey of private sector firms by the EBRD in 2016 [33] reveals that political instability was the most commonly cited concern. That corresponds to the major concern of MENA political leadership, especially after the 2011 uprisings (Fig. 2).

By contrast, whereas political leaders see the problems of higher education and the job mismatch as regime-threatening, the private sector is focused on access to finance, corruption, power supply, political instability, and the informal sector as

[16] The EBRD MENA Enterprise Survey (MENA ES) was conducted in 2013 and 2014 in eight middle-income economies in the region: Djibouti, Egypt, Jordan, Lebanon, Morocco, Tunisia, the West Bank and Gaza, and the Republic of Yemen. Surveyed firms employed at least five employees, operating in manufacturing or service sectors. Six thousand firms were surveyed. One hundred percent publically-owned firms were excluded.

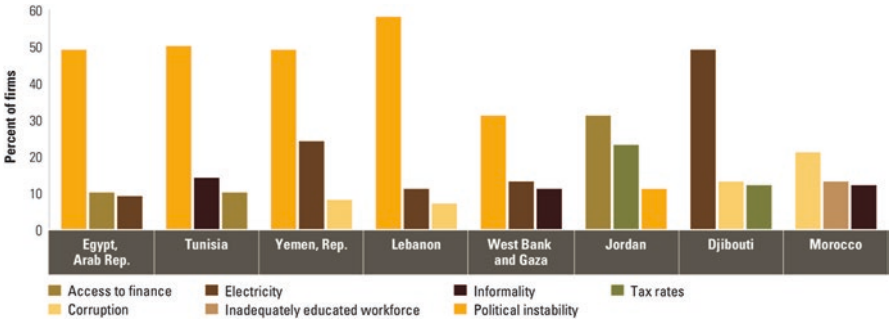


**Fig. 2** Political instability is most commonly chosen as top obstacle by MENA surveyed firms (2013/14). (Source EBRD [33], Fig. 2.5)

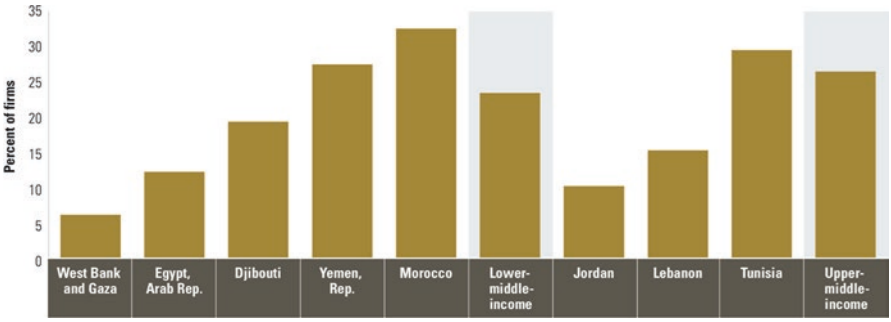


**Fig. 3** The proportion of firms reporting and inadequately educated workforce as a severe constraint. (Source: EBRD [33], Fig. 4.11)

their major firm-level challenges. An inappropriately educated work force is not among their major concerns (Fig. 3).

The EBRD report stresses that firms experiencing rapid growth are much more concerned by the skills mismatch because they rely more heavily on university-educated employees than other firms of comparable size. But size is also a predictor of concern for appropriate skill-sets.

Large size firms will be the most likely to employ university graduates. By contrast, formal SMEs tend not to grow very much. So large, young, export-oriented firms may be those that suffer the most from the mismatch and hold the key to employing the educated unemployed. We may conclude that there are sufficient shared concerns between the governments and their private sectors concerning political stability and the need to address the mismatch to sustain a policy reform process.

Melonio and Mezouaghi [57] are correct that the timeframe for such a reform process to address the mismatch is necessarily very long, since the professional status of teachers, university admission practices, and the increase of faculty in

expanding programs are all components of a higher-education system requiring from 10 to 20 years to evolve.

It is important to keep in mind that educational reforms may seem daunting but no more so than curtailing public employment, reducing consumer subsidies, extending lines of credit to young entrepreneurs, easing labor regulations, and enhancing the ease of doing business. Reforming education and educational outcomes may not be as important as reforming the business environment. In Ragui Assaad's view (email Nov. 27, 2017), only when the private sector is generating a much higher proportion of total jobs will the issue of the mismatch become critical. Until then, addressing the causes of informality, for example, might have the greatest reform impact, but leaving it alone to work its magic is the most tempting course. My analysis sees the private sector as a critical player, one that is increasingly recognized by policy-makers. But the fact that at present the formal private sector may provide only 10–15% of new jobs to educated youth seeking work raises the question of just how much attention it should receive.

## 8 Quality Assurance

Quality assurance (QA) has a soothing, almost bland ring to it. It is the gentle face of reform. It has been a major WB and CMI project in the Arab world since the turn of the millennium. Adriana Jaramillo, senior education specialist at the World Bank, summarized the program in 2011 in these words:

> The University Governance and Quality Assurance Program stems from a partnership between the CMI and the Middle East and North Africa (MENA) Human Development Department of the World Bank. Its purpose is to address insufficient access to higher education, inconsistent quality of higher education institutions across the region, and discrepancies between graduates' skills and the skills demanded by the labor market.

The main thrust has been on establishing standards, benchmarks, and KPIs, strategic planning, and accreditation [59, 60]. These headings allow university leaders, outside agencies, and would-be reformers to raise all the structural and systemic issues of autonomy and excellence that might otherwise alarm political leaders. But even if there is an element of reform by stealth embedded in QA, there is also the risk that all involved will treat it more as theatre than as grasping the nettle of structural reform (for background, see [61]. In its human-resource development strategy, Jordan's reformers, led by Queen Rania, tick all the appropriate boxes [34]:

> Our system strives to provide world-class experiences and outcomes for all involved. It aligns with the needs of the local and global economy. It is globally respected and meets, if not exceeds, international standards through accreditation, certification, and quality assurance. We continually monitor ourselves to identify and implement improvements.

In 2007, a regional organization, the Arab Organization for Quality Assurance in Education was founded (aroqa.org). Only a small minority of Arab universities are full members of AROQA and only Jordan University and Jordan University of

Science and Technology are top tier. AROQA holds an annual conference, which may help bolster a "community of practice" in institutional assessment. It aspires to become a regional accreditation organization.[17]

By 2012, 14 Arab countries had engaged in some level of quality assurance [63, 64]. Egypt pioneered in QA in 2002, on the strength of a $50 million grant from the World Bank. The National Quality Assurance Agency was established in 2006, independent of the Ministry of Higher Education and of the Council of Ministers. It developed a QA handbook for universities, using 19 standards for assessment. The assumption was that the university actually has the ability to deal with the standards. This is not at all self-evident. Under the governance standards, there is no direct questioning of centralized budget and finance procedures. Assessment teams could find rubrics under which to comment on the relations of universities to the Supreme Council and to the Ministry, but they are not obvious.

Syria got on board QA, establishing in January 2005 the Higher Committee on Quality and Accreditation. It was tasked with adopting ongoing self-evaluation at universities, setting criteria for quality and academic distinction, establishing a quality-assurance system for public and private higher-education institutions with external auditing of quality, and setting criteria for the government's accreditation of degrees.

Tunisia joined up in 2008 ([42], see also [65], with passage of a law to meet quality and employability challenges. It constitutes the basic higher education law, defining the main principles and objectives underlying the design of Tunisia's higher-education system. It introduced formally the LMD (License-Master's-Doctorate) scheme. Boughazala [42] cautions that the test of the Law will be its implementation.

Lebanon, with World Bank funding, took up QA in 2002, but at the time of writing (2017), Lebanon's largest and only public university, Lebanese University, had not joined the process. It had allowed visiting teams to assess specific departments but not LU as a whole. Ironically the QA initiative is led by Dr. Ahmad Jammal, the Director-General of the Ministry of Education and a tenured member of the LU faculty, but his clients, as it were, are all private universities. LU, he judges, sees threats and few opportunities in QA (interview April 13, 2013). LU is not alone. Many Arab universities shy away from QA out of fear of "unfair comparisons" or of any kind of structured evaluation [62, 66]. Inasmuch as most universities do not have control over the variables that define their quality, their fears are not misplaced.

There is a risk that IHLs will merely go through the motions of QA. A self-evaluation at the Faculty of Economic, Social and Juridical Sciences of Mohammed V University in 2007 concluded:

> Because of the great number of students, the culture of quality is not a major preoccupation of the faculty. No system of quality assurance has been put in place. There is no system of evaluation. [67]

[17] Regional accreditation is likely to be a tough sell. Public universities resist accreditation even by domestic agencies that are likely to be lenient. Private institutions are more likely to seek accreditation abroad, especially in the US [62].

In a World Bank survey of 100 Arab universities [61] (see also [60]), there is an astonishing avowal for which the authors offer no analysis or explanation:

> Although institutions report that they have mechanisms in place to monitor achievement of their goals, in reality little evidence was found of systematic use of key performance indicators.

Strategic planning and the rigorous measurement of progress toward goals (KPIs) are almost always unpopular both among university administrators and among faculty. Accrediting agencies insist on these exercises, but they may result in formulaic behavior without producing change.

## 9 Incompletion Rates

There is an area of reform that could produce significant improvement in job placement, economic performance, and mitigating the forces in higher education that generate inequality. Moreover, this reform area embodies relatively low political costs for incumbent leaders and potentially high rewards. The reform agenda consists in analyzing the reasons for non-completion of degree programs and undertaking the remedial work to help students survive.

The MENA is not alone in facing high drop-out rates in tertiary education. For example, only 61% of US students at 4-year colleges complete their degrees within 200% of the time allotted [68]. For 2-year programs the rate is around 21%.

Raising completion rates is low-hanging fruit. Unlike encouraging students who would have ended their education in high school, the non-completers have already demonstrated their commitment to higher education. Completion of their degrees enhances significantly the rate of return to their education.

Those most likely to drop out in the US come from lower-income brackets and from minorities, so that increasing completion rates would strike a blow for greater equality of outcomes. There is no reason to believe that the dynamic in the MENA would not be the same.

## 10 R&D

A public policy expert in Abu Dhabi once remarked to me: “People here are transactional. They are not really interested in innovation. Their attitude is why invest in development of things if you can buy them off the shelf. Let someone else pay for the R&D”.

The stereotype, like most, has some truth to it but not much. Arabs in different institutional settings make superb scientists and innovators. In their own countries, however, there is fear of the institutions that might unlock innovation and scientific research.

The three vital partners to vigorous R&D cultures are not, in the Arab world, up to the task. Universities tend to produce bureaucrats, not scientists; the state is more concerned with rent-seeking than productivity; the private sector lacks legitimacy and acts in a manner to sustain that image. The political system, despite the official rhetoric, acts to re-enforce those roles [69]. In 2008, by way of example, Cairo University's total research budget came to $4 million; this for a university with global aspirations [70].

Nonetheless, some of the institutional component parts of an R&D culture are being assembled. In a number of countries, "techno parks" and innovation cities" have been set up to attract the private sector and to act as catalysts to university and government-sponsored research. King Abdulaziz City for Science and Technology is the forerunner, founded in 1977. Other examples include Masdar City in Abu Dhabi, with, at its core, the Masdar Institute of Science and Technology managed by MIT, Qatar's City of Science and Technology, and the Zewail City of Science and Technology in Cairo. Morocco designated Fez, Marrakech, and Rabat as innovation cities. Specific universities, such St. Joseph (private) in Lebanon have launched incubators: in this instance Berytech. It concentrates on the IT sector and by 2011 had helped launch 100 companies [45, 71].

The fact is that with rare exceptions the private sector is not structured nor motivated to respond to the call. Its overall contribution to R&D investment is no more than 10% (the government and public universities account for the rest). Some multinational firms with operations based in Arab countries—think of Renault in Morocco (where 40% of its total vehicle construction is located) or Boeing in Abu Dhabi—may be ready to participate, at least in form, but the heart of their R&D efforts will remain in their home countries. A few parastatals like Morocco's Office Chérifien des Phosphates or Saudi Arabia's Aramco take research seriously and invest in it (1% of OCP's annual sales goes into R&D).

There is a paradox here. In several spheres, the Middle East is at the frontier of innovation: water management and desalinization, petrochemicals and alternative sources of energy, genetically-modified seeds for drought and heat resistance, and treatment of medical problems with high prevalence in the region such as diabetes, obesity, hypertension, and hepatitis c. Yet, outside of Israel, it would be hard to discern a major regional research push in these areas.

That said, we do find some promising policy innovators. Tunisia has set up a funding system that provides core financing for research as opposed to competitive applications for specific projects (the model adopted by Lebanon's National Council for Scientific Research). In 1996, Tunisia instituted a national evaluation system to identify worthy research units to be funded directly by the Ministry of Research. By 2008 the evaluation council had identified 330 research units and 250 laboratories that qualified for funding. The Ministry, through its core-funding grants, would cover 65% of operating costs and 35% toward the research itself. The funding cycle is 4 years with a mid-term review. In parallel, the same research entities may compete for project funding. The competition process favors consortia of research units. There has been an exponential increase in Tunisia's research output since the beginning of the millennium [45].

Jordan is also something of a pioneer in innovation and R&D. The country does not enjoy petroleum or other natural-resource rents. It has a fairly dynamic and forward-looking private sector. King Abdullah and Queen Rania have been visible sponsors of both private-sector and higher-education reform. Despite all that, Jordan has not had notably more success than elsewhere in the region in fostering a symbiosis between universities and the private sector. The Jordanian private sector is most active in pharmaceuticals, ICT, renewable energy, and health services. Obvious areas of university-private sector collaboration are in energy efficiency, quality improvement, and product development.

In an interview on July 28, 2015 [72], Fouad Mrad recounted the history of the ESCWA (Economic and Social Commission for West Asia) sponsored Technology Center in Amman. In 1979, the eminent physicist and analyst of Arab scientific progress, Tony Zahlan, was invited by ESCWA to prepare a feasibility study for a technology transfer center for the Arab world. He did and nothing happened. He was asked to re-do it in 2005, and once again nothing happened. Mrad finally launched the Center under the auspices of ESCWA in 2010.

The Center is tiny, built on soft Gulf money or contributions in kind. Its board of directors comes from big, relatively well-financed national centers like the Kuwait Institute for Scientific Research (KISR) or the Qatar Foundation (QF) with thousands of employees. Mrad has had some success in programs to inspire youth to get into innovation and science.

He confirms the conundrum of the "broken cycle", i.e. the failure to develop synergies among governments, universities, and private sectors. He echoes Hanafi [69], confirming that the basic innovative talent is locked up in universities where all the incentives drive it away from relevance and useful creativity. Academics are discouraged from engaging in relevant, patentable research by the quest to publish in refereed international journals. The issue of how to evaluate consultancies, public policy contributions and the like is not engaged. Instead, academics are content to write mediocre articles for international journals that have little local impact or relevance. The concern for international ranking systems will only re-enforce this trend.

In more advanced economies, something like 2–3% of GDP is devoted to R&D. Of that about two thirds come from the private sector but, unsurprisingly, the private sector is interested in applied research and specifically in the D of R&D, the "development" of marketable products from applied research. Governments typically foot the bill for most basic research, that is, research that may not (yet) have obvious implications for applied research (for a useful overview focusing mainly on the US, see Press 2013 [73]) The leaders world-wide today in R&D expenditure are Finland, South Korea, Israel, Sweden, and Singapore—all vigorous and prosperous trading nations. In 2014, The Republic of Korea led the world in R&D investment at 4.29% of GDP [74]. The US trails a bit at 3% and China around 2%. The average outlay for the Arab world is 0.3%. Qatar (2.8% ca. 2014) and Tunisia (over 1% for a number of years) lead the region. The oil-rich countries can afford to invest, but Saudi Arabia lags far behind Qatar in its R&D effort. The leading OECD countries are putting four to ten times the proportion of national wealth into R&D than what

**Table 1** Outlays on education and R&D in the Arab World: 2010

| Country | Pub. Exp. on Ed %of GDP | Pub. Exp. on Ed % Govt. Exp | GERD[a] % of GDP |
|---|---|---|---|
| Tunisia | 6.4 | 16.5 | 1.2 |
| Morocco | 5.7 | 25.7 | .75 |
| Jordan | 4.9 | 20.6 | .30 |
| Egypt | 3.8 | 11.9 | .23 |
| Lebanon | 2 | 8.1 | .20 |
| Syria | 4.9 | 16.7 | .12 |
| Iraq | 5.1 | 6.4 | – |
| Algeria | 4.3 | 20.3 | .16 |
| Sudan | .4 | 4.1 | .30 |
| KSA | 5.7 | 19.3 | .05 |

Source: Hanafi [69]
[a]*GERD* Gross Expenditure on R&D

Arab states are investing. Their ratios of research scientists to total population are also vastly higher. Arab countries average 371 researchers per million, far below the world average of 1081. Veale in Jan. 2015 [75] summarizes the situation:

> This striking underperformance is caused by several factors, including political instability, a lack of public funding for science and technology, the absence of scientific societies and the almost absent participation of the private sector.[18]

It is instructive that the regime-shaking uprisings of 2011 elicited, at least for a few years, a growth spurt in Arab R&D outlays [48, 71, 79] especially in Algeria, Jordan, Morocco, Tunisia, and Egypt. Egypt's new constitution of 2014 made research funding a constitutional issue (Article 23) (Table 1).

> The state grants the freedom of scientific research and encourages its institutions as a means to achieving national sovereignty, and building a knowledge economy. The state sponsors researchers and inventors, and allocates a percentage of government expenditures that is no less than 1% of Gross National Product to scientific research. It will gradually increase until it reaches global rates.

[18] I list here some examples of what might be called an R&D virtuous circle.

Norwick Mills, a small, specialized textiles plant in New Hampshire is joining with the US Defense Dept. and research universities, including MIT, and 50 other companies in a $320 million project to produce smart textiles, using blends of advanced synthetic materials and embedded with sensors to make the battlefield uniforms of the future [76].

The German industrial giant, BASF, invests $2.2 billion in R&D annually and employs about 10,000 in research. It generates about 1000 patents a year.

It works with 600 universities, research firms and companies and has its own venture capital company [77].

Alexandria University, the second largest (after Cairo University) and second oldest (after Al-Azhar University) higher-education institution in Egypt, is in an administrative district with the same name that is home to 40% of Egypt's industries. It functions as a chief research hotbed for local companies, which often do not have their own research and development operations [78].

Political leaders must have understood the linkage between jobs, economic growth, and research/innovation. This is a text-book example of crisis-driven reform and one that did not last once the crisis eased.[19]

## 11 Partnerships and Regional Cooperation

The Arab world, despite its aspirations, has never achieved the levels of economic and political integration of the EU. Its relative disarray has only been accentuated since 2011. There is nothing in the region like the European education space set up by the Bologna Process. On the eve of the 2011 uprisings, the situation was already bleak. Of 3.76 million students enrolled in Arab universities, 3.6 million were citizens, or 96.3%. There were 109,000 students from other Arab countries (2.9%) attending universities outside their home countries, while non-Arabs totaled 28,816, or 0.8%. These data show clearly that student mobility among Arab countries is practically absent, while student mobility from other regions to Arab countries is practically non- existent [13]. There were no regional systems of accreditation nor of degree equivalency. Inter-Arab research was minimal. Faculty movement was driven almost entirely by wage differentials, with the oil-rich importing faculty from the oil-poor. External linkages were overwhelmingly with the leading universities of the OECD.[20]

Since 2011, the situation has deteriorated further. The four partially or wholly-failed states of Libya, Yemen, Iraq, and Syria can play no meaningful role in regional education except to export students and faculty cut adrift by their failed systems. The civil conflict in these states has polarized regional politics roughly into pro-Saudi and pro-Iranian camps, with a few (Morocco, Jordan, Kuwait, Oman) trying to straddle the divide.

The one positive element is the universities' quest for new sources of revenue. Offering courses and degrees to Arab students with the ability to pay is a means to this end. It appears, however, that private universities are more adept at attracting such students, who are often the rejects of their own public systems, than are public universities.

[19] Note that my reasoning here reflects the trap mentioned at the outset of this chapter, that we read back from results to find plausible causes, and that if crisis is assumed to be a driver of change, then all changes may be attributed to "crisis", a tautology.

[20] The Qatar Foundation made grants to institutions outside Qatar contingent on joint research with Qatar University or other institutions in Qatar's Education City.

## 12 Information Technology

The reform agenda in the MENA is conventional. The region is slowly moving to catch up with a western educational model that many in the West believe to be obsolete. Information technology is the tool to engineer new, unconventional modes of education; modes that call into question the bricks-and-mortar university with its massive infrastructure and sunk capital costs. IT is also at the heart of innovative research and stimulating the region's private sector.

In this latter respect, the Kingdom of Jordan has for some time been a pioneer. The Jordan Education Initiative (JEI) was launched in 2003 under the auspices of the World Economic Forum (WEF), USAID, and the British Council, and was designed to improve education through a public-private partnership [80]. It is focused mainly on 100 pre-university "Discovery Schools". Jordanian public agencies, in partnership with private sector technology companies, seek to transform secondary education.[21]

Another initiative, under the auspices of the Queen Rania Foundation, is the MOOC, Edraak (to realize or be aware in Arabic) launched in 2013 in collaboration with EdX of Harvard and MIT [81]; see also [82]. It has translated or developed a couple of dozen courses in Arabic that range from child mental health, and statistics and epidemiology to entrepreneurship 101. Over 2 million individuals have subscribed to its courses, and it boasts 1.2 million registered learners (email communication from Mustafa Habib, Edraak, Aug. 6, 2017).

Egypt spends about $100 million a year for printing textbooks, more than the operating budget of Cairo University. Minister of Education and Technical Education, Tariq Shawqi in 2017 advocated a major thrust toward on-line texts.[22] A few years earlier, I interviewed Ali Ibrahim, President of the Central Management Services Authority in the Ministry of Finance [84] in Cairo, May 18, 2014. When I suggested that digital materials and on-line education could offer economies of scale across Egypt's 23 public universities, Ibrahim seemed almost shocked. First, he noted, universities are legally autonomous; "we cannot merge any parts of their budgets" He warned that "the professors wouldn't like" any form of on-line instruction. "Professors have their own style and methods. Moreover some might lose books sales revenues". Ibrahim concluded that what I was suggesting is Utopian. Similarly, Amira Sayed Ahmed [85] found considerable skepticism among Egyptian experts regarding on-line education or even electronic textbooks. Power outages, highly skewed access to the internet, and even the reluctance of conservative parents

[21] There are 46 partners in the initiative, including: the British Council, Cisco Systems, Computer Associates, Corning Cable Systems, Dell, Fastlink, France Telecom, Hewlett Packard, Intel, the Krach Family Foundation, Microsoft, the Jordanian Ministry of Education (MoE), the Jordanian Ministry of ICT (MOICT), RazorView, the U.S. Agency for International Development (USAID), the U.S. Middle East Partnership Initiative, and the WEF.

[22] Shawqi embodies the risks accruing to a vigorous reformer in a highly bureaucratized and routinized system. See [83].

to allow their daughters to go to computer labs were all cited as reasons why Minister Shawki's plans would not work.

In 2000, Prince Talal bin Abdelaziz of Saudi Arabia founded the Arab Open University (AOU), in partnership with the Open University-UK. It offers blended learning with on-line courses developed by Open University-UK combined with face-to-face tutorials with local scholars. The latter must provide ca. 25% of total study time in order to satisfy the equivalency requirements of the eight countries in which it operates.[23] In 2017, it enrolled about 28,000 students.

Cadi Ayyad University of Marrakech, Morocco, has enthusiastically embraced MOOCs (240 courses are offered) and distance learning. In the span of 7 years, it has quintupled its total enrolment to ca. 102,000 students. About two thirds are 'physical' students while the remainder are 'virtual', connected through on-line open courses. Cadi Ayyad is in partnership with Microsoft to make it a "smart university".

## 13 Conclusion

Because the reform process depends heavily on public authorities, we should not be surprised that little "disruptive innovation" in the sense used by Clayton Christenson 1997 and 2008 [86, 87] has occurred. The current set of government and private sector providers have left demand for specific kinds of education unmet. There are opportunities for disruptors to enter the market, but if they emerge they will surely come from the private sector.

They will be disruptive in the sense of avoiding the heavy outlays on physical infrastructure and attendant operating costs of the traditional campus. They may also challenge the predominant course-credit model that underlies most credentialing and accreditation systems. In its place, they will offer competency-based learning in which the student proceeds at her/his own pace while being periodically examined to demonstrate mastery of a certain field or subject matter. In the US, these "alternative pathways" (including MOOCs, boot camps, internships, and competency-based education: [88, 89] are growing but their results have been mixed. They do seem to correct for some socio-economic bias in the formal university system, but they also manifest very high non-completion rates. Inasmuch as providers are often for-profit, incompletion means money down the drain for participants.

The economic dynamic that has led to growing private provision of education at all levels will not diminish in the foreseeable future. Creative ways to meet unmet demand will be found. Policy-makers will be challenged to find ways to regulate the new providers. There is the distinct possibility, however, that private providers will

[23] Kuwait, Lebanon, Jordan, Saudi Arabia, Egypt, Bahrain, Oman and Sudan. I am grateful to Imad Baalbaki, AOU board member, for background information on the AOU (email correspondence, August 6 and September 3, 2017).

be part of crony networks that sustain incumbent regimes and hence will be protected from regulation.

I have made some bold and worrying assumptions about the views of autocratic regimes toward higher education. I have followed the dangerous *démarche* of reading backwards from observed results to hypothesized causes. I think political leaders are worried about survival and are willing to take some risks to avoid catastrophic losses. The private sector is passively supportive of reform initiatives, but its history over the past decades is not one to encourage private actors to lead the reform process. We have more empirical evidence of private sector views than we do of autocratic leadership views.

To date, the educational reform agenda has been modest and has relied for progress on third-party leverage. Yet it appears to be the case that political leaders can discern the links among education, the job market, and economic growth, all of which help define their own political legitimacy. All political leaders recognize that something must be done, but they hope that whatever that is, the basis of their rule will not be challenged in the process. They are right to be worried.

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# Digital Transformation and Quality, Efficiency, and Flexibility in Arab Universities


**Milad Sebaaly**

**Abstract** Disruptive technologies such as AI, Big Data, and the intersection of cloud, social, and mobile have major impact on higher education. From developing technology-enhanced learning programs, to curriculum structural changes leading to flexible, blended, online, and accelerated programs, all the way to even rethinking the entire business model and delivering User Experience Design/User Interface Design (UX/UI) friendly administrative services via mobile apps; the impact of technology is becoming substantial. New technological developments are fueling innovative university applications: new cloud computing capabilities and applications, social media via mobile devices, multimedia and virtual reality, tracking, and targeting via geolocation sensors provide easier and better ways of communication among university constituencies. On one hand, this helps in responding to the pressure of higher student expectations for enhanced learning and better user experience when accessing university services. On the other hand, it helps in improving the university's competitive advantage in an internationalized market, and has direct results on enhancing the learning experience and quality of service; more efficient student recruitment and retention, more efficient operations and reduced costs, greater classroom innovation, new modes of research, and easier access to both administrative tools and academic coursework from any device. A single application accessible from any device can now manage the student's entire life on campus. More digital services result in more data collected on every aspect of university life, and thus in more effective data analytics and intelligent forecasting and planning. This extension of reach, effectiveness, and quality cannot happen without a proper change-management strategy resulting in embracing new digital skills and an overall cultural change.

**Keywords** Digital transformation · Blended learning · Quality-of-service · Learning analytics · Innovative university services

M. Sebaaly (✉)
Global Learning International FZ-LLC, Dubai, UAE
e-mail: msebaaly@gl.ae



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_8

## 1 Introduction

Disruptive technologies such as AI, Big Data, and the applications of cloud, social, and mobile technologies have major impact on various sectors in nowadays society, including higher education. New technological developments are fueling innovative university applications at all levels of the university lifecycle, namely: learning, research, and administrative activities. The marketplace requirements of tomorrow's graduates are also being drastically affected by digital transformation and the introduction of new technologies. How can the impact on higher-education institutions in the Arab World enhance their quality, efficiency, and flexibility to produce the right graduates who can cope with a fast-paced changing world?

## 2 Digital Transformation and Skills Disruption

We live in a world that is increasingly fast-paced, where it is more and more rare to have a "job for life", where more roles at risk of being automated or disrupted, and where core skills evolve and new ideas are introduced with growing frequency. An average graduate will have different jobs, across different industries, in the course of a career, and will have to coexist with applications of modern technology such as artificial intelligence, machine learning, cloud computing, cybersecurity, big data analytics, internet of things, robotics, smart manufacturing, 3D printing, simulation, virtual and augmented reality. Many current roles and jobs will be automated and replaced by such applications.

Fifty percent of all existing jobs are likely to be automated within the next 20 years [1]. An average of 35% of core skills will change between 2015 and 2020 as shown in Fig. 1. Although the rate of disruption would vary across sectors of countries and regions, almost all sectors and regions will be affected even if at different speeds.

Anything that cannot be digitized or automated will dramatically increase in value. Thus, the careers that survive will be those that demand higher-order thinking skills. An example of such required skills is critical-thinking skills, defined to be a type of thinking that remains too advanced, too nuanced, and too creative to be emulated by machine intelligence or AI.

Conventional degrees from Ivy League universities are not sufficient to meet the current and future market needs.

Market facts and figures show that companies that now interview candidates "blind" -without reference to their academic backgrounds – include Google, Penguin Random House, and Ernst & Young. "For every job, the No.1 thing we look for is general cognitive ability, and it's not I.Q. It's learning ability. It's the ability to process on the fly." states Laszlo Bock, SVP of Google [2].

Three out of four (74.6%) managers and executives who responded to the AMA 2012 Critical Skills Survey said that they believe these skills and competencies will become more important to their organizations in the next 3–5 years [3].

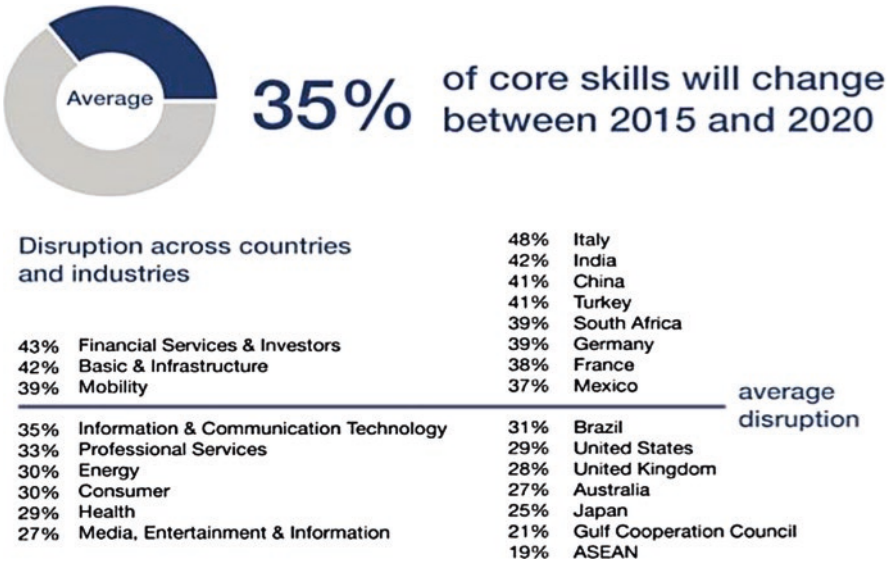


**Fig. 1** Skills disruptions. (Source: Future of jobs report, World Economic Forum)

Ninety-six percent of employers worldwide strongly agree or agree that business-school graduates should create value for their companies, 98% of employers believe these graduates need to know how to use data to drive decisions, and 97% of employers believe that these graduates must have exceptional interpersonal skills [4].

Nine out of ten employers judge recent college graduates as poorly prepared for the workforce in such areas as critical thinking, communication, and problem-solving [5].

## 3 Transferable Higher Order Thinking Skills for Futureproof Graduates

The Future of Jobs report issued by the World Economic Forum in 2016, states that the skill set most demanded by employers in 2020 include complex problem solving, critical thinking, creativity, emotional intelligence, judgement and decision making, and cognitive flexibility, among others (Fig. 2). This type of higher-order thinking skills is very hard to develop and to measure within the current educational systems, which focus on the bottom three skills of Bloom's Taxonomy Pyramid (Fig. 3), namely remember, understand, apply, while the most demanded skill set belongs to the upper three skills of this pyramid, namely, analyze, evaluate, and create. Modern AI and smart applications, as well as robotic solutions utilizing machine learning, can easily replace employees in jobs that only require skills that the current educational systems provide.


**Fig. 2** The skillset most demanded by employers in 2020. (Source: Future of jobs report, World Economic Forum, 2016)

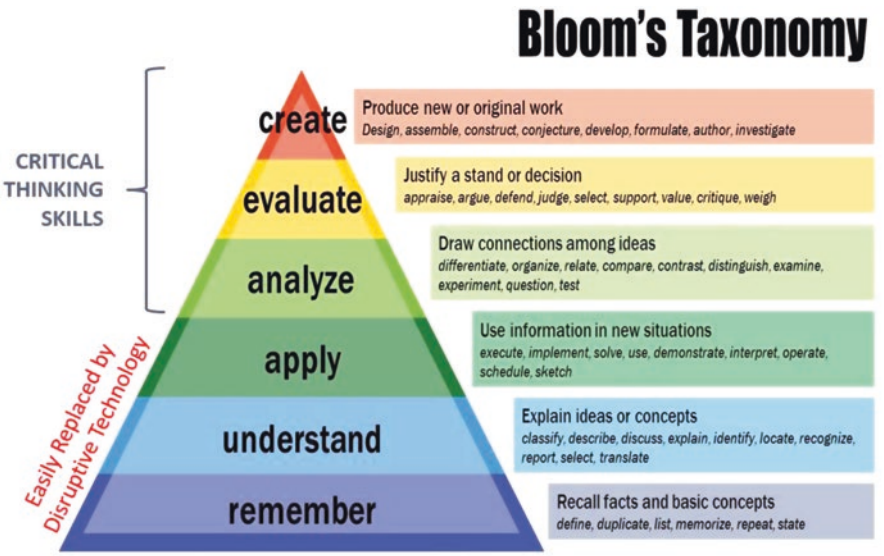


**Fig. 3** Bloom's taxonomy

Therefore, the only way forward is to benefit from the impact of digital transformation on higher-education institutions and try to embed higher-order thinking skills such as critical thinking, creative thinking, and complex problem solving into educational programs and curricula, and thus equip tomorrow's graduates with the skills needed in the marketplace, in order to be futureproof and avoid being replaced by disruptive technology applications. This is however much easier said than done.

Education is thus required to teach portable, higher-order thinking skills that graduates can use across their careers. An example of such skills is critical thinking, which is the product of active, reflective, self-directed, reasonable, and purposeful thinking, required to tackle unfamiliar situations and engage with new ideas. A graduate with good critical-thinking skills is someone who can think for himself, question himself, consider all possibilities, see new solutions, and have original ideas. Whereas a graduate with weak critical-thinking skills is someone who follows others' thinking, only questions others, considers what's convenient, sees only the obvious, and copies other people's ideas. Most current educational systems did not reach a stage where they can confirm with comfort that they are able to shape their graduates based on the former model.

The challenge remains at what needs to be done at the higher-education system to produce the required futureproof graduates, who are adaptable, act independently, and move beyond what they already know or guess. Graduates who do not accept things on trust, can find new and creative solutions where others see only problems and a mass of data, accept that they may get things wrong and deal with it, always try to maximize their chances of success, are less likely to make expensive or damaging mistakes, are persistent and flexible in thinking, are able to control impulsivity, are trained to search for accuracy, are able to communicate with clarity and precision, are willing to take measured risks in thinking, are careful to apply existing knowledge to new situations, and are open to new possibilities and further learning…

Therefore, in this fast-paced changing world as Einstein stated: "The value of an education in a liberal arts college is not the learning of many facts, but the training of the mind to think something that cannot be learned from textbooks." [6]. And as the former U.S. Secretary of Education Richard Riley predicted, "The top 10 in-demand jobs in the future don't exist today. We are currently preparing students for jobs that don't yet exist, using technologies that haven't been invented, in order to solve problems we don't even know are problems yet." [7].

## 4 Impact of Digital Transformation on Higher Education

The age of hyper-connectivity and artificial intelligence resulted in large-scale digital transformation in different sectors, resulting in disruption of skills and jobs, and the drastic need for futureproof graduates. It also has a high impact on higher education. Would this impact enhance or disrupt existing models? And would it result in better quality, flexibility and relevance?

The optimal objective and ideal case would be to capitalize on the digital transformation impact on higher education and utilize it to modify the current models to be able to produce the previously described futureproof graduate. In order to achieve this, it is crucial to look into the impact of digital transformation at the three main activities in higher education as follows.

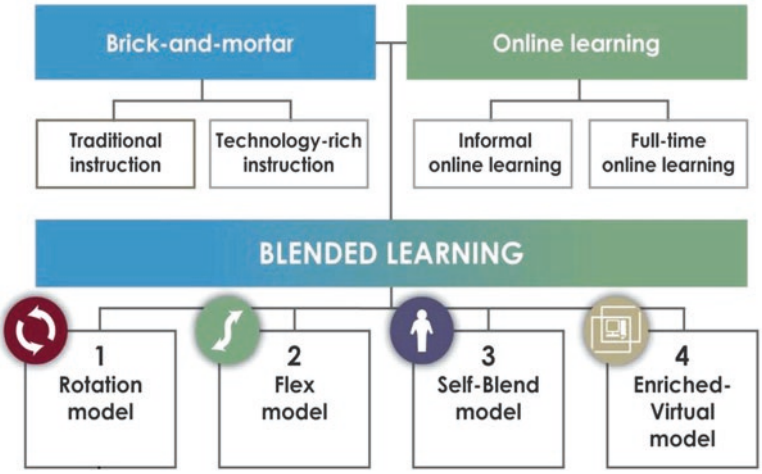


**Fig. 4** Blended learning models

## *4.1 Learning*

- Developing technology-enhanced learning models, including: self-learning, Lifelong learning, research skills, discovery-based learning, gamification, game-based learning, problem-based learning, teamwork and virtual collaborative learning, proactive learning, formative assessment and instantaneous feedback, individualized student-centered learning, and various models of blended learning (Fig. 4)
- Developing modern learning strategies
- Curriculum structural changes leading to flexible and accelerated programs
- Introducing digital interactive content, with adaptive AI enhancement, and AR/VR applications.
- Developing digital learning platforms

New technological developments such as new cloud-computing capabilities and applications, social media via mobile devices, multimedia and virtual reality, tracking and targeting via geolocation sensors, easier and better ways of communication among university constituencies, are all fueling innovative university applications. This is helping universities to respond to the pressure of higher student expectations for enhanced learning and better user experience when accessing university services.

## *4.2 Research and Development*

- Augmenting technological innovation and applications
- Enhancing international collaboration

- Building a healthy research environment require the utilization of technology in the following areas: speedy information retrieval, authenticity of information, a viability of critical information at the right moment, searchable updates from different scientific communities, a secure global data bank of research materials, accessible to every remote research group, timely procurement of resources, content accessibility for researchers, real-time collaborative research, and virtual labs allowing international innovative research.

## *4.3 Administrative Services*

- Rethinking the entire business model and delivering smart UX/UI friendly administrative services via mobile apps
- Improving the university's competitive advantage in an internationalized market, and enhancing the learning experience and Quality of Service:
  - More efficient student recruitment and retention
  - More efficient operations and reduced costs
  - Greater classroom innovation
  - New modes of research
  - Easier access to both administrative tools and academic coursework from any device
  - A single application accessible from any device can now manage the student's entire life on campus
- Utilizing Big Data Learning Analytics, which is the collection, aggregation, analysis and visualization of the data about learners and their interaction with the various learning platforms in a learning eco-system (Fig. 5) for the purpose of better understanding and optimizing the learning process and to facilitate better decision making.

Big Data Learning Analytics consists of the following components:

- Reports and descriptions provide answers to questions such as what went wrong, and what went well.
- Alerts, notifications and recommendations provide answers to questions such as what is happening now, and what is my next best action.
- Future trends and predictions provide answers to questions such as what to expect in the future, and how to plan for the future.
- Precursor for personalization and adaptive learning provide answers to questions such as how the content can adapt to suit the student.

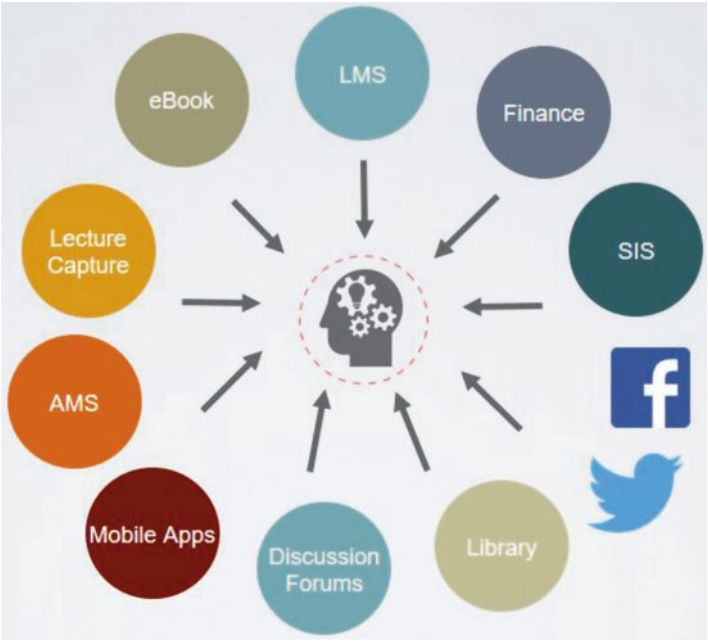


**Fig. 5** Big data learning analytics – data collection

## 5 Implementing Innovative University Applications

More digital services result in more data collected on every aspect of university life, and thus in more effective data analytics and intelligent forecasting and planning.

Disruptive technologies such as AI, Big Data, and the intersection of cloud, social, and mobile have major impact on higher education.

This extension of reach, effectiveness, and quality cannot happen without a proper change-management strategy resulting in embracing new digital skills and an overall cultural change.

The Navitas Ventures 2017 Report on Digital Transformation in Higher Education [8] shows that the preferable approach to digital transformation is to digitize some elements of the current model and to create new digital models (Fig. 6) in comparison to other options such as digitizing some elements of the current model only, fundamentally creating a new digital model only, or fully digitizing the current model and creating new digital models.

It also shows the major impact new technologies such as AI, IoT, AR/VR, Chatbots, Robotics, and Blockchain, shall have on university leaders and students (Fig. 7).

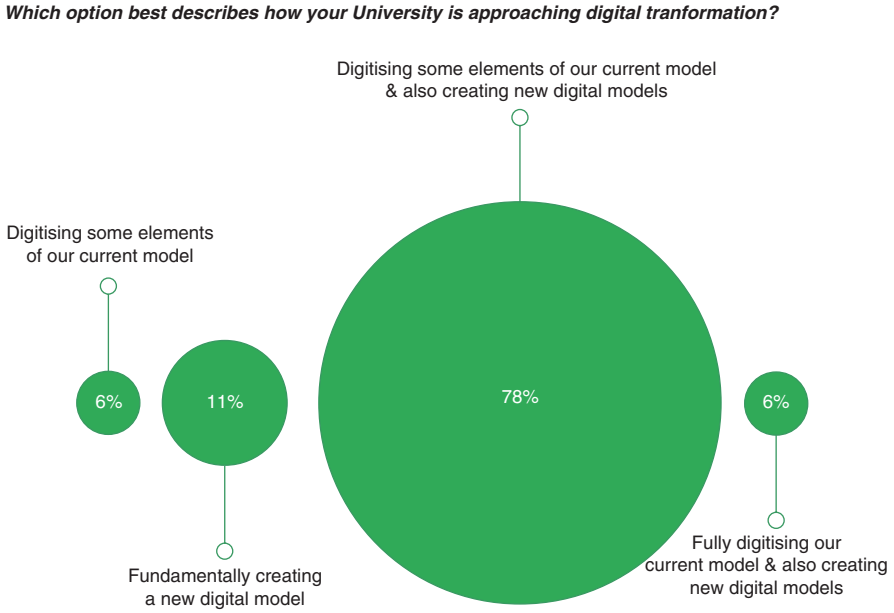


**Fig. 6** Digital transformation approach. (Source: Digital Transformation in Higher Education. Navitas Ventures – 2017 Report)

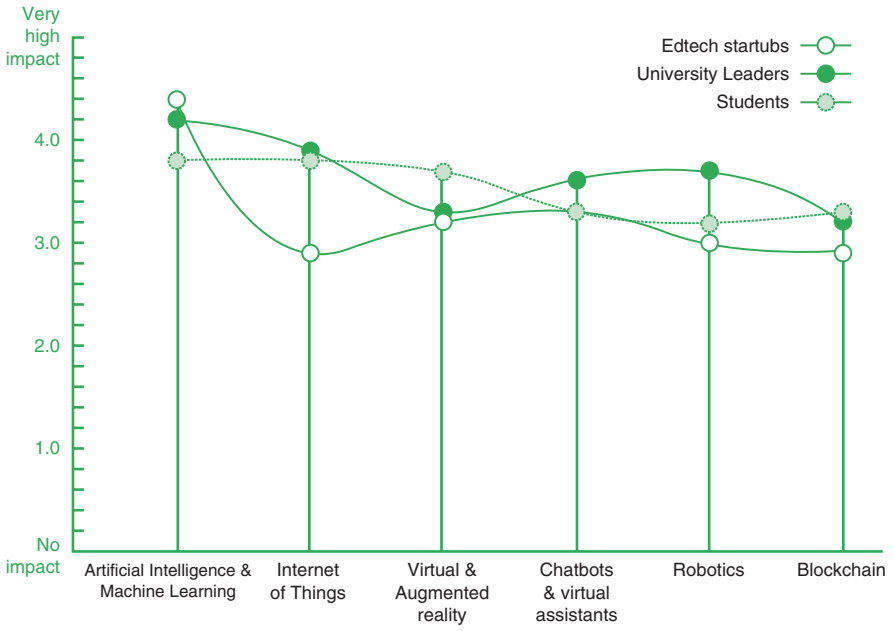


**Fig. 7** Digital transformation impact

## 6 Some Caution Is Required

Universities are not simply undergoing a technological transformation. Beneath that change, and camouflaged by it, lies another issue: the commercialization of higher education. For here as elsewhere technology is but a vehicle and disarming disguise.

This is why the following fears need to be addressed with caution:

- Fear of presenting education as a commodity
- Fear of commercialization of education
- Faculty fear of becoming redundant

Overall, universities see digital transformation as a way to enhance their current model, rather than change it.

Moreover, the use of technology entails an inevitable extension of working time and an intensification of work, as faculty struggle at all hours of the day and night to stay on top of technology and respond, inside classroom, or via chatrooms, virtual office hours, and emails.

## 7 Where Do Arab Universities Stand?

In general, Arab universities are lagging behind in digital transformation and effective utilization of technology, at all learning, research, and administrative levels. Several reasons cause this: lack of funding, lack of expertise, entrenched conventional models, fear of taking risks and trying new models, as well as faculty and administrative leadership resistance.

Very few disruptive projects have been implemented, resulting in novel educational models such as virtual, online, blended or smart learning programs or institutions. Universities in rich Arab countries make huge investments in technology-related projects, mostly to enhance their infrastructure and devices, with minimal impact on the existing educational, research, and administrative models.

A major additional constraint is imposed by conventional regulatory bodies, most of which still have old conventional rigid licensing and accreditation standards and models. This has direct impact on educational quality, flexibility, and relevance.

With the fast technological and socio-economic developments, Arab countries need to move towards embracing knowledge economies, and to design and adopt digital strategies. A major success factor and catalyst of such direction is developing existing and new human capital. This requires that higher education institutions become more flexible, agile, impactful, and relevant to nowadays market needs, in order to produce the right human capital, with the right higher-order thinking skills and competencies of leadership, innovation, creativity, and complex decision making.

## 8 Closing Remarks

The tipping point for institutional leaders – the time at which a change or effect cannot be stopped – will occur when the inability to meet the digital expectations of today's education customers impacts the quantity and quality of students enrolling in their universities. The institutions showing progress towards enhanced digital capabilities cannot continue to work in pockets of change rather than at broader levels within the institution.

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# Indicators of Institutional and Program Ranking of Universities with Reference to the Arab World


**Adnan Badran and Serene Badran**

**Abstract** Currently, for a population of circa 400 million in the Arab world, there are 700 public and private universities in the Arab world with an enrollment of 13 million students and 250,000 academic staff (faculty). The 300 private universities accommodate 30% of the student enrollment, compared with 50% in Japan, 30% in Europe 30%, and 20% in the U.S.

Ranking is controversial and biased in favor of research in the natural and medical sciences with less emphasis on engineering and social sciences, and largely ignore the humanities, and favor publications in English.

Academic rankings of world universities vary in the criteria used for excellence. Shanghai Tiao Tong university ranking "Academic Ranking of World Universities" (ARWU), established in 2003, was based on two indicators: published papers in top journals and staff winning high awards.

ARWU ranks 500 top world universities. Institutions are ranked in 52 subjects across natural sciences, engineering, life sciences, medical sciences and social sciences using a minimum standard of publication threshold. It uses four criteria: quality of education (10%), quality of faculty (20%), research output (60%), and per capita academic performance (10%).

Times Higher Education World University Ranking (THE) started with Quacquarelli Symonds (QS) in 2004 and split later with Thomson Reuters in 2009. Along with ARWU and QS world universities rankings, THE are the three most influential international university rankings.

THE uses 13 indicators grouped under five categories: teaching (30%), research (30%), citation-research impact (32.5%), international collaboration (5%), and innovation (2.5%).

A. Badran (✉)
Department of Nutrition, University of Petra, Amman, Jordan
e-mail: abadran@uop.edu.jo

S. Badran (✉)
University of Jordan, Amman, Jordan
e-mail: serene.badran@gmail.com



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_9

The QS ranking uses six indicators: academic reputation (40%), employer reputation (10%), faculty-student ratio (20%), citations per faculty (20%), proportion of international students (5%), and proportion of international faculty (5%).

Jordan Ranking for universities which was developed recently by the Higher Education Commission, is based on giving the university an overall ranking score in respect to five major performance indicators: teaching and learning (score 250), scientific research (score 250), internationalization (score 150), quality of graduates (score 200), and academic accreditation (score 150).

The introduction of university rankings has created competition for global standing, quality graduates, and research outputs.

**Keywords** Ranking Universities · Institutional ranking · Indicators of ARWU · Times Higher Education · QS rankings · Ranking universities in Arab region · Jordan ranking · Weights of ranking universities · Comparison between ranking league tables

## 1 Introduction

Ranking has driven universities to excel in teaching/learning and provide the facilities and funds to support faculty members to publish in high-quality journals. Ranking has created competition for world standing, quality graduates, and research output [1]. No doubt, rankings will influence students' choice of what university to join for pursuing his/her study and also the choice of teaching/research staff for institutions providing an environment for excellence and career development.

Ranking started in the U.S. in 1983 for academic institutions and programs, to advise parents and students where to go for quality of higher education [2]. But the question is **why rank**? The U.S. ranking started with the annual publication of "America's Best Colleges", followed thereafter by America Best Academic Programs. Countries followed the American example for giving information to stakeholders, clients, and using ranking as **marketing strategies** of the institutions of higher education. Parents and students remain the main audiences of ranking as well as governments and foundations giving scholarships to students. University rankings spread quickly particularly among the newly established private universities and was known in the United Kingdom as League Tables.

Academic programs are built in an inducing environment for quality learning and research. The institution has to deliver quality for the marketplace. So career development and employability are indicators to push the ranking of the university upward. Also, the delivery of patents and research outputs in high-impact journals with recognized citations will enhance the ranking reputation of the institution.

Ranking, therefore, will ignite competition among higher education institutions for excellence in teaching and research. But the question remains, **who ranks?** The numbers of universities are on the increase in every continent and massification

requires an independent annual analytical peer-review based on sets of standards and indicators.

The review should be done by unbiased independent agencies to measure quality of internationally recognized learning outcomes. Nowadays, private and media-based magazines or newspapers do most rankings, but governments and professional associations are playing a greater role.

Indicators vary from one agency to another. Therefore, the outcomes of university ranking vary accordingly. Some ranking agencies emphasize publications of high impact, citations, and research, whereas others emphasize quality teaching, internationalization, reputation, employability, faculty ratio to students, and other indicators.

Ranking has to adopt certain standards for academic quality. Data should be collected from original sources. Variables should be established and weighted, then calculation and comparison are undertaken to sort out ranking in computerized format.

World-class universities are moving away from local-linked approaches to offer an international character based on international standards to offer global opportunities for mobile students across political borders. So ranking has overcome competition among universities inside one country to international competition, for world-class universities [3].

There is no doubt that ranking is shaping the horizon of potential students, parents, employers, and governments on the quality of higher education. However, global ranking may be misused, particularly when it becomes the main driver of the university in any country, ignoring the social link with local needs. This may also lead to diverting state resources to ranking at the expense of solving problems and being relevant to the needs of the local community [4]. Yes, ranking is important for comparison with other higher-education institutions, but should not be based only on the ranking standards and ignore the criteria of development and public service. Professor Martin of the University of Queensland Australia puts it “International rankings are meant to identify the best workplaces, yet none of the rankings evaluate indicators like job satisfaction, work-life balance and equal opportunity [4].

Institutions may be ignoring equity and serving students with lower socio-economic and academic backgrounds by being more selective simply to climb the ladder of ranking tables.

The World Bank has brought 100 higher-education institutions from seven Arab countries in the MENA region (Middle East and North Africa) into an initiative to enhance governance, quality, and accountability through capacity building for intended learning outcomes (ILOs). Action plans to improve their performance were adopted against a benchmark with peers.

It would be naive to think that rankings are not important: they are here to stay [5]. Nevertheless, we should not forget the importance of universities in developing the community and society at large, both socially and economically, and the obligations these institutions have to serve tax payers.

## 2 Who Does the Global University Ranking and What Criteria Are Used?

There are three global major leading university rankings [6]:

### *2.1 Academic Ranking of World Universities*

ARWU – referred to as "Shanghai Jia Tong University in China", emerged in 2003 and is based on academic awards i.e. Noble laureates etc. and cited research papers published in high-impact journals such as Science in the U.S. and Nature in the U.K.

- Shanghai ranking targets world research universities, only picks 1000 universities out of the 17,000 universities in the world and top 500 are ranked in the league table.
- Institutions are ranked in 52 subjects (2017) across natural sciences, engineering, life sciences, medical sciences and social sciences, using minimum standards of publication thresholds.
- Institutions with Noble prizewinners, and publications in Science and Nature journals are included, and biased toward them.
- ARWU consists of objective indicators only, all the data used are from third parties and publicly available and do not use data directly from universities.
- Shanghai ranking started out to measure the gap between Chinese universities as compared to world-class universities.
- China has tried to rank world research universities according to academic and research performance and based on world comparable data, and decided to publish its ranking on the internet in 2003 as academic ranking of world universities (ARWU).
- ARWU is biased towards natural sciences.
- Many universities are aiming at ARWU ranking which they consider the university elite league. University of Manchester is aiming for top 25 by 2050. University of Toulouse is aiming for top 100 within 20 years. Queen Mary, University of London, Macquarie University in Australia, China Medical University, and others have set a target to become within the top 150, 200, 500 in sequence.
- Shanghai ARWU ranking is transparent, elitist, and highly reputable ranking system for universities. Criteria, indicators, and weights are shown in the following listing:

| Criteria | Indicator | Weight (%) |
|---|---|---|
| 1. Quality of education | Alumni winning Nobel Prizes and Fields Medals | 10 |
| 2. Quality of faculty | Staff Nobel Prizes and Fields Medals | 20 |
| | Highly cited researchers in 21 areas | 20 |
| 3. Research output | Papers in Nature and Science | 20 |
| | Papers indexed in Science Citation Index-expanded and social Science Citation Index | 20 |
| 4. Per capita performance | Per capita academic performance of an institution | 10 |

## *2.2 Times Higher Education World University Ranking (THE)*

- Created in 2004 with QS World University Ranking before separation in 2009.
- Biggest in the league, list top 1000 universities in the world as the only global performance table to judge world-class universities across teaching, research, knowledge transfer, and international outlook.
- THE ranking [7, 8] expanded due to dramatic change in higher education, from 5 performance indicators to 13 performance indicators to provide the most comprehensive balanced comparison trusted by students, academics, university leaders, industry and governments.
- THE World University Ranking is no longer based on outsource data, but has its own in-house rankings team of professionals who work directly with institutions to collect data to provide transparency, governance, and accountability based on institutional data.

### 2.2.1 "THE" World Universities Ranking Domain Tables (2017)

Ranking tables include the following:

- World universities ranking.
- BRICS (Brazil, Russia, India, China, and South Africa) and emerging economies rankings.
- Asian university rankings.
- Latin America rankings.
- One hundred fifty institutions under 50 years of age.
- World reputation rankings.

### 2.2.2 "THE" Performance Indicators (2017)

The Times Higher Education (THE) World University Rankings includes 13 separate indicators to provide a comprehensive and balanced comparisons.

The 13 performance indicators are grouped into the following areas:

- Teaching (learning environment).
- Research (volume, income, reputation).
- Citations (research impact).
- International outlook (staff, students, and research).
- Industry engagement (income, knowledge-transfer).

THE global rankings examine global competitive research performance and citations.

### 2.2.3 "THE" Weights Indicators (2017)

1. **Learning environment: 30%**
   - Reputation: 15%
   - Staff to students ratio: 4.5%
   - Doctorate to bachelor ratio: 2.25%
   - Doctorates awarded to academia ratio: 6%
   - Institutional income: 2.25%
2. **Research**: **30%**

   Reputation: 18%
   Income: 6%
   Productivity: 6%
3. **Citations:** 30%
4. **International outlook: 7.5%**
5. **Industry-income and knowledge-transfer: 2.5%**

### 2.2.4 BRICS and Emerging Countries

1. **Advanced emerging**:

   Brazil, Czech Republic, Greece, Hungary, Malaysia, Mexico, Poland, South Africa, Taiwan, Thailand, Turkey.
2. **Secondary emerging:**

   Chile, China, Colombia, Egypt, India, Indonesia, Pakistan, Peru, Philippines, Qatar, Russia, UAE.

3. **Frontier:**

   Bahrain, Bangladesh, Botswana, Bulgaria, Cote d'lvoire, Croatia, Cyprus, Estonia, Ghana, Jordan, Kenya, Latvia, Lithuania, Macedonia, Malta, Mauritius, Morocco, Nigeria, Oman, Palestine, Romania, Serbia, Slovakia, Sri Lanka, Tunisia, Vietnam.

## *2.3 QS World University Rankings*

QS [9, 10] initiated the world universities ranking in 2001 and launched the THE-QS world ranking in 2004 based on research, teaching, and international metrics. Graduates and employability were added to form the four center pillars which rankings are based on today.

1. Annual ranking by Quacquarelli Symonds (QS) targets institutional and academic programs similar to THE ranking, but different from Shanghai (ARWU) ranking which address only the world top research universities.
2. QS ranking targets global overall world universities and subject rankings.
3. In 2007, QS switched to Scopus (Elsevier) from ESI for citation data.
4. QS has used Full-Time Equivalent (FTE) data for all personnel data and reached a new level of exposure and most widely used basis for comparing universities across borders.

### 2.3.1 QS Ranking Portfolio (2018)

The portfolio is composed of the following:

- QS world universities ranking
- QS university rankings: Asia
- QS university rankings: Latin America
- QS university rankings: by subject
- QS best student cities
- QS ranking 50 universities under 50 years old.

### 2.3.2 QS Criteria for Ranking and Weights (2018)

- Academic reputation: 40%
- Employer reputation: 10%
- Student to faculty ratio: 20%
- Citations per faculty: 20%
- International faculty: 5%
- International students: 5%

QS ranking is stable and unique with simple methodology, discipline-independent, language-independent, and withy a low dependence on self-reporting.

QS is the only ranking system that gives weights to graduate employability, which is important to graduates. The survey questions employers, identifying which universities are producing the best graduates for the marketplace. It gives the student an outlook of universities outside their national borders with a reputation of employability once they graduate.

### 2.3.3 QS Ranking by Subject (2018)

QS ranking covers 46 subjects (2018) in arts and humanities, engineering and technology, life sciences and medicine, natural sciences, social sciences, and management.

### 2.3.4 QS Ranking by Faculty (2018)

Four performance indicators are used to rank the world top 400 universities in 5 faculty areas:

- Arts and humanities.
- Engineering and technology.
- Life sciences and medicine.
- Natural sciences.
- Social sciences and management.

### 2.3.5 QS Ranking for Graduate Careers (2018)

1. Best universities ranking in creating student-employer connection.
2. Best universities in alumni outcomes.

### 2.3.6 QS Established Five Key Criteria of Graduate Employability

- Employer reputation: 30%
- Alumni outcomes: 20%
- Employer partnership: 25%
- Employer-student connection: 15%
- Graduates employment rate: 10%

### 2.3.7 QS Regional Rankings (2018)

- QS also targets five regional rankings: Asia, Latin America, Emerging Europe and central Asia, Arab Region, and BRICS.

### 2.3.8 QS Ranking Universities of the Arab Region (2018)

Ranking weights are distributed as in the following:

- Academic reputation: 30%
- Employer reputation: 20%
- Faculty-student ratio: 20%
- Web impact: 10%
- Proportion of staff to PhD: 5%
- Citations per paper: 5%
- Papers per faculty: 5%
- Proportion of international faculty: 2.5%
- Proportion of international students: 2.5%

## *2.4 Thomson Reuters (TR)*

TR is not a ranking agency, but is involved in collecting data on Higher Education Institutions (HEIs) to be utilized by Leiden Ranking, Shanghai Ranking, U-Multirank, and U.S. News Best Global Universities. Ranking for performance metrics allow comparisons among HEIs in the world.

Collection of data starts in May and June of every year. This includes data collection from universities combined with bibliometrics data and survey of reputation, all utilized by the ranking agencies. Data are refreshed in the fall of each year.

## *2.5 U-Multirank*

This is a European ranking system that has been developed as an alternative approach to the existing global rankings. The European Commission developed it for a better and broader global ranking in HEIs (2011). So far, two editions were created, the first in 2014, the second in 2015.

Multirank differs from other rankings in the following respects.

1. Multi-Dimensional approach for multiple purposes and activities. It combines the analysis of research performance with four additional other university performances. Performance is measured per indicator and is user-driven.

2. As an alternative to the "League table" U-Multirank uses five performance groups.
3. U-Multirank is user-driven, considers "absolute and objective relevance" and it is the ranking client who decides on the selection of dimensions and indicators and not the ranking producer. Institutional profiles are identified to compare "apples with apples". It differs from other ranking systems, which heavily focus on research and reputation, and focus on teaching-led and regionally engaged institutions.
4. Users can create their own ranking by interactive website (www.umultirank.org) according to their performance.
5. U-Multirank uses 30 indicators in 5 dimensions: teaching/learning, research, knowledge transfer, international orientation, and regional engagement. It provides ranking at the level of the institutions and disciplines and invites participating universities to supply their data and institutional profile.
6. U-Multirank presents some innovative research and innovative performance indicators not found in other rankings.
7. Ready made rankings have been developed by U-Multirank for coherent indicators to present specific performance aspects such as research and linkages, economic involvement, internalization, teaching and learning.
8. Registration is from March until July, publication in March of every year. Data collections sent by institutions start within 3 months of March, followed by verification as an interaction with the institution to correct their data, corrected data are then submitted for "second verification" with an interaction process, and the final phase is for data analysis and calculations of final score. Student surveys are adapted to national contexts.
9. The institutional rankings are updated every 2 years, and field-based ranking every 3 years. There are 1200 universities from more than 80 countries in the U-Multirank database. It is the largest database worldwide.

## *2.6 U.S. News Best Global Universities Ranking*

The U.S. ranking (based in Washington DC) was developed in 2014. Although, national ranking has been published for 30 years for U.S. Best Colleges and Universities, so the new U.S. rank system was an extension of the old published yearly in U.S. News Best Global Universities. Ranking data collection is based on Thomson Reuters information. The published ranking is in October of every year.

The ranking indicators used for U.S. News are: reputation, publications, citations, highly cited papers and college-specific data on enrollment, faculty etc.

### *2.7 Other Global Rankings of Universities*

There are CWTS Leiden Ranking and the Webometrics Ranking systems. There is also an interesting one that ranks universities around the world in terms of their environmental sustainability: the UI Green Metric World University Ranking created and compiled by the University of Indonesia.

Scimago Institutions Rankings (SIR) is a classification of academic and research institutions ranked according to three sets of indicators based on research performance, innovation outputs, and social impact measured by Web visibility [11].

## 3 Comparison: Which University Ranking Has the Most Authority?

There are different approaches used by different ranking systems [12] and it is hard to say what is the most appropriate.

ARWU reflects academic quality [13] particularly faculty and alumni who won the Noble prize as a result of work done at the university, thereby preventing buying-out Noble prize winners. Also, ARWU measures quality of research published in key journals. It measures excellence of educational and research outcomes but in a narrow perspective.

QS and THE rankings are broadly based include students number, international faculty, and students, all influenced by world reputation. Leiden focuses on scientific impact of publications from 500 universities. While Webometrics ranking is based on links the university homepage have with other institutions and good management of the website. So "authority" of a ranking system to measure performance of HEIs is hard to determine which is the most informative to the need of the institution. Table 1 shows the comparison between the three world major ranking systems.

## 4 How Universities Improve Their World-Class Ranking

It is difficult to envisage that one size fits all. Regardless of ranking position, indicators have to evaluate current conditions to drive institutional direction.

**Table 1** Comparison between three major ranking systems

| Academic Ranking of World Universities (ARWU) | QS World University Rankings (QS-WUR) | Times Higher Education of World University Ranking (THE) |
|---|---|---|
| Per Capita Performance **10%** | Citations per faculty **20%** | Learning environment **30%** |
| Nobel/Fields Medal Alumni **10%** | Academic Peer Review **40%** | Research **30%** |
| Nobel/Fields Medal Winner **20%** | Employer Review **10%** | Citations per paper **30%** |
| HiCi Researcher **20%** | Student Faculty Ratio **20%** | International outlook **7.5%** |
| Nature/Science Articles **20%** | Int'l Student **5%** | Industry-knowledge transfer **2.5%** |
| SCI/SSCI/A&HCI Articles **20%** | Int'l Faculty **5%** | |

Source*:* Badran, Adnan 2017 AAS Conference Beirut November 11–12, 2017

### *4.1 For Thomson Reuter*

Strategies on improving performance of research quality, appointing best faculty, building leadership in staff, improving governance and transparency, ensuring that faculty and administration are clear about the learning outcome and the mission, vision and objectives of the university. The faculty should ensure that bibliometric providers are counting accurately all research papers and citations, since they are weighted heavily in ranking methodology [14].

### *4.2 For ARWU Shanghai Ranking*

Emphasis should be on research excellence, recruiting promising researchers, and monitoring the performance of the faculty and schools.

### *4.3 For Times Higher Education (THE) World University Rankings*

Institutions should focus on set of performance indicators to change their position on the ranking scale.

### *4.4 For QS World University Rankings*

Emphasis on institutional transparency through being better every year in ranking position. The following five components contribute to better and faster climbing the steps of a higher ranking position:

- Governance: sustained, isolated from political change or manipulation.
- Performance-driven.
- Focus: excellence and branding, cost-effective.
- Branding: is essential for recognition and partnership and should be honest.
- Collaboration: joint research means higher impact.
- Ensure that academic peer and employers list well prepared, that they have knowledge of university achievement in research, innovation and excellence of the learning environment.
- Ensure that all research papers are registered with Scopus to reflect the university outstanding in research.

### *4.5 For U-Multirank*

For good ranking outcomes, the university should:

- Have a clear strategy and profile in research, teaching, knowledge transfer, internalization and regional engagement.
- Optimize its information system in a transparent way.

### *4.6 For U.S. News Best Global Rankings*

The university needs to take seriously their external data reporting, accuracy, and proper distribution. Accurate data reflect positively in rankings. The faculty should ensure that papers published are indexed properly so as to get full credit for publications on citations, web of Science-Thomson Reuters, Scopus-Elsevier.

## 5 Is Ranking Biased?

- Looking at indicators of ranking systems, we find that ranking is biased toward publication in English and toward American and European journals (Language biased).
- Also, ranking in general favors publications in medical and biological sciences and ignores publications in local and regional journals in the local language in the MENA region, directed at solving local problems (Regional biased).
- Some ranking indicators favor large universities (Large-institution biased).
- Secondary effects of previous ranking positions, so those who were ranked highly continue to be so (Inherited-merit biased).
- Also, some rankings ignore social and humanities sciences(Less-social-humanities biased).

- Ranking indicators somewhat marginalize E-Learning, online or MOOC (massive open online course) and life-long learning (Online-Learning biased).
- Focus on numerical data rather than on the real education of students (Data biased).
- Retrieval ignores the quality of Web documents although link-based measures as PageRank are used [15].
- Citations may give a way for manipulation; "you cite me, I'll cite you".
- Some institutions manipulate data to move up in ranking position.
- Contracting high-caliber international professors for the purpose of short-term improvements in ranking.
- Most rankings are somewhat commercially oriented.

## 6 Although Rankings Might Be Biased, We Have to Take Them Seriously

- University rankings clearly ignite competition among HEIs.
- They lead to excellence in both subjects and institutions.
- They keep the university in a dynamic process of development.
- Awareness of governments to support HEIs.
- Awareness by parents where to send their teenagers for higher education.
- They spreads the culture of transparency.
- Rankings enhance mobility of international staff and students, and influence student choice [16].
- Build-up regional and global reputation and collaboration.
- Rankings help establish a "brand" of quality.
- Improved ranking position helps attract funding.

## 7 Can Ranking Be Improved?

- Give more weight to learning outcomes.
- Address non-journal publications.
- Ranking should cover more universities, not the elites only.
- Regional and national impact of learning and research outputs.

## 8 New Alignment in Ranking: Middle East and Africa

There is a shift in international student mobility toward the Middle East because of the rise in institutional ranking of higher education. Therefore, universities in the Middle East are investing more resources in improving their world ranking [17].

As Africa is launching new socioeconomic development plans, improvements in higher education and R&D are essential for development. New reforms in higher education are in process to produce creative thinkers, innovators, and entrepreneurs to start up companies in the knowledge-based economy. Changes to meet economic and social demands have successfully initiated excellence and career education to a competitive standard for the marketplace. Internalization of universities in the region is on the march.

## 9 Top World Universities 2017–2018

### *9.1 Shanghai ARWU Academic Ranking of Top World Universities (2017)*

Table 2 shows Shanghai ARWU Academic Ranking of top 10 world universities (2017) [18, 19]. Harvard (US) came as 1st in the world, Stanford (US) 2nd, Cambridge (UK) 3rd, MIT (US) 4th, University of California at Berkeley (US) 5th, Princeton (US) 6th, Oxford (UK) 7th, Columbia (US) 8th, Caltech (US) 9th, University of Chicago (US) 10th.

ARWU uses six indicators to rank world universities including number of alumni and staff winning Noble prizes and field medals, number of highly cited researchers and number of articles published in Nature and Science, and articles indexed in Science Citation Index and Social Sciences Citation Index. One thousand two hundred ten universities are ranked every year and best 500 are published. Shanghai ranking is an independent not legally linked to any university or government. It has been cited as starting point for national strengths and weaknesses, facilitating

**Table 2** ARWU-academic ranking of top world universities 2017

| World rank | Institution | National rank | Total score | Score on alumni |
|---|---|---|---|---|
| 1 | Harvard University U.S. | 1 | 100.0 | 100.0 |
| 2 | Stanford University U.S. | 2 | 76.5 | 44.5 |
| 3 | University of Cambridge UK | 1 | 70.9 | 81.4 |
| 4 | Massachusetts Institute of Technology (MIT) U.S. | 3 | 70.4 | 68.7 |
| 5 | University of California, Berkeley U.S. | 4 | 69.1 | 64.4 |
| 6 | Princeton University U.S. | 5 | 61.1 | 54.4 |
| 7 | University of Oxford UK | 2 | 60.1 | 50.8 |
| 8 | Columbia University U.S. | 6 | 58.8 | 62.8 |
| 9 | California Institute of Technology U.S. | 7 | 57.3 | 50.5 |
| 10 | University of Chicago U.S. | 8 | 53.9 | 59.2 |

Source*:* Shanghai Ranking, ARWU (2017)

reforms and new initiatives. Its methodology is sound, stable, and transparent. It provides a fair comparison in research performance.

World Top Universities (2017) were from Australia, Austria, Belgium, Brazil, Canada, Chile, China, Denmark, Finland, France, Germany, Greece, Iran, Hong Kong, Ireland, Israel, Italy, Japan, Malaysia, Netherlands, New Zealand, Norway, Poland, Portugal, Russia, Saudi Arabia, Singapore, Spain, South Africa, South Korea, Sweden, Taiwan, UK, and USA.

ARWU fields are Natural Sciences and Mathematics, Engineering/Technology and Computer Sciences, Life and Agriculture Sciences, Clinical Medicine and Pharmacy, Social Sciences.

ARWU academic subjects are Mathematics, Physics, Chemistry, Economics, Computer Science, & Engineering.

## *9.2 THE- Times Higher Education Ranking of Top World Universities 2018*

Table 3 shows the top 10 world universities as ranked by Times Higher Education 2018. University of Oxford (UK) is leading as 1st in the world followed by Cambridge (UK) as 2nd followed by Caltech (US) as 3rd, Stanford (US) 4th, MIT (US), 5th , Harvard (US) 6th, Princeton (US) 7th, Imperial College (UK) 8th, University of Chicago (US) 9th, Swiss Federal Institute of Technology (Zurich) 10th.

**Table 3** THE-times higher education ranking of top world universities 2018

| Rank | Institution | No. of FTE students | Ratio students per staff | % International students | Ratio Female:Male |
|---|---|---|---|---|---|
| 1 | University of Oxford UK | 20,409 | 11.2 | 38% | 46:54 |
| 2 | University of Cambridge UK | 18,389 | 10.9 | 35% | 45:55 |
| =3 | California Institute of Technology US | 2209 | 6.5 | 27% | 31:69 |
| =3 | Stanford University US | 15,845 | 7.5 | 22% | 42:58 |
| 5 | Massachusetts Institute of Technology US | 11,177 | 8.7 | 34% | 37:63 |
| 6 | Harvard University US | 20,326 | 8.9 | 26% | n/a |
| 7 | Princeton University US | 7955 | 8.3 | 24% | 45:55 |
| 8 | Imperial College London UK | 15,857 | 11.4 | 55% | 37:63 |
| 9 | University of Chicago US | 13,525 | 6.2 | 25% | 44:56 |
| =10 | Swiss Federal Institute of Technology Zurich | 19,233 | 14.6 | 38% | 31:69 |

Source*:* Times Higher Education, THE 2018

"THE" 2018 list the top 1000 universities in the world, the largest international league table.

It evaluates research-intensive universities across teaching, research, knowledge transfer and international outlook, with 13 performance indicators.

The Overall "THE" World University Rankings (www.timeshighereducation.com/world-university-rankings/2018/world-ranking) accompanied by subject rankings in the following:

- Arts and humanities (subject –ranking/arts-and-humanities).
- Business and economics (subject –ranking/business-and-economics).
- Computer science (subject-ranking/computer-science).
- Engineering and technology (subject-ranking/engineering-and-IT).
- Life sciences (subject-ranking/life-sciences).
- Medicine (subject-ranking/clinical-pre-clinical-health).
- Physical sciences (subject-ranking/physical-sciences).
- Social sciences (subject-ranking/social-sciences).

Ranking can be filtered by country and each university has a detailed profile to help students. (www./student/advice).

## *9.3 QS Ranking of Top World Universities 2018*

Table 4 shows the QS ranking of top 10 world universities (2018). MIT (US) is leading as 1st in the world followed by Stanford (US) as 2nd, followed by Harvard (US) 3rd, Caltech (US) 4th, Cambridge (UK) 5th, Oxford (UK) 6th, University College London (UK) 7th, Imperial College (UK) 8th, University of Chicago (US) 9th, Swiss Federal Institute of Technology (Zurich) 10th.

Looking at QS ranking of top universities in the world, we find a trend of continuity and stability in maintaining the positions, of the top ten. There is a slight shift among them, but they always occupy the top positions. Nine UK universities and US were on the top of the World, Switzerland occupied the tenth position. In addition to the Ranking overview (QS – World – University – Rankings), there is QS Ranking by subject and region:

- QS World University Rankings by Subject (/subject-rankings/2018).
- QS World University Rankings by Region (/region-rankings/2018).
- QS Top 50 under 50 (/top-50-under-50).
- QS Stars Rating system (http://www.topuniversities.com/qs-stars/home)

**Events (events):**

- QS Graduate Employability Rankings.
- (https://www.topuniversities.com/university-rankings/employability-raknings/2018)
- QS Best Student Cities (/best-student-cities),

**Table 4** QS ranking of top world universities 2018

| Rank | University | Overall score | Academic reputation | Citation per faculty | Employer reputation | International faculty | International students |
|---|---|---|---|---|---|---|---|
| 1 | Massachusetts Institute of Technology (MIT) U.S. | 100 | 100 | 99.9 | 100 | 100 | 96.1 |
| 2 | Stanford University U.S. | 98.7 | 100 | 99.4 | 100 | 99.6 | 72.7 |
| 3 | Harvard University U.S | 98.4 | 100 | 99.9 | 100 | 96.5 | 75.2 |
| 4 | California Institute of Technology (Caltech) U.S. | 97.7 | 99.5 | 100 | 85.4 | 93.4 | 89.2 |
| 5 | University of Cambridge UK | 95.6 | 100 | 78.3 | 100 | 97.4 | 97.7 |
| 6 | University of Oxford UK | 95.3 | 100 | 76.3 | 100 | 98.6 | 98.5 |
| 7 | University College London (UCL) UK | 94.6 | 99.7 | 74.7 | 99.5 | 96.6 | 100 |
| 8 | Imperial College London UK | 93.7 | 99.4 | 68.7 | 100 | 100 | 100 |
| 9 | University of Chicago U.S. | 93.5 | 99.9 | 85.9 | 92.9 | 71.9 | 79.8 |
| 10 | ETH-Zurich-Swiss Federal Institute of Technology | 93.3 | 99.6 | 98.7 | 99.4 | 100 | 98.8 |

Source**:** Qs Ranking 2018

- QS System Strength Rankings (/system-strength-rankings/2016),
- Related articles (/university –rankings-articles/world-university-rankings).
- Prepare (http://www.qsleep.com/).

**Discover (universities):**

- University search (/universities).
- Subject guides (/courses).
- Study destination guides (/where-to-study/home).
- Scholarship advice (/student-info/scholarship-advice).

# 10 Top Universities in the Arab Region 2017–2018

## *10.1 Shanghai ARWU Ranking of Top Universities in the World 2017*

There was no single Arab university in the top 100.

ARWU Ranking of leading universities in the Arab region were King Abdulaziz University (101–150), King Saud University (101–150), King Abdullah University of Science & Technology (201–300), King Fahad University of Petroleum & Minerals (401–500), Cairo University (401–500).

They came all in the category of 100–500 World rank (Table 5**).**

Qatar University, Ain Shams University, and Alexandria University came in the second category of 600–800 World rank (Table 6).

Arab Universities have a long way to catch up with ARWU criteria and standard, in term of excellence in research and teaching [20].

## *10.2 For THE-Times Higher Education Universities Ranking of the Arab Region (2018) [19]*

KAS (SA) came out first followed by Khalifa University (UAE) 2nd, followed by JUST (Jordan) 3rd, Qatar University 4th, AUB 5th, KFU (SA) 6th, KSU (SA) 7th, UAE University 8th, Alfaisal University (SA) 9th, Kuwait University 10th, THE World rankings of Universities top 16 in the region were in the category margin of (200–1000) world ranking as shown in Table 7.

**Table 5** ARWU Arab region ranking of top universities 2017

| World rank | Institution | National rank | Score on alumni |
|---|---|---|---|
| 101–150 | King Abdulaziz University | 1–2 | 0.0 |
| 101–150 | King Saud University | 1–2 | 0.0 |
| 201–300 | King Abdullah University of Science and Technology | 3 | 0.0 |
| 401–500 | King Fahd University of Petroleum & Minerals | 4 | 0.0 |
| 401–500 | Cairo University | 1 | 19.0 |

Source: Shanghai Ranking ARWU 2017
Note: No Arab Universities in Top 100

**Table 6** Top 501–800 Arab universities 2017

| World rank | Institution | Score on alumni |
|---|---|---|
| 601–700 | Qatar University | 0.0 |
| 701–800 | Ain Shams University | 0.0 |
| 701–800 | Alexandria University | 12.4 |

Source*:* Shanghai Ranking ARWU 2017

**Table 7** THE-times higher education Arab region ranking of top universities 2018

| World univ. ranking | Arab region ranking | University |
|---|---|---|
| 201–250 | 1 | King Abdulaziz University SA |
| 301–350 | 2 | Khalifa University UAE |
| 401–500 | 3 | Jordan University of Science and Technology JO |
| 401–500 | 4 | Qatar University QR |
| 501–600 | 5 | American University of Beirut LB |
| 501–600 | 6 | King Fahd University SA |
| 501–600 | 7 | King Saud University SA |
| 501–600 | 8 | United Arab Emirates University UAE |
| 501–600 | 9 | Alfaisal University SA |
| 601–800 | 10 | Kuwait University KT |
| 601–800 | 11 | American University in Cairo Egypt |
| 601–800 | 12 | Beni-Suef University Egypt |
| 601–800 | 13 | American University of Sharjah UAE |
| 801–1000 | 14 | University of Jordan JO |
| 801–1000 | 15 | Imam Abdulrahman Bin Faisal University SA |
| 801–1000 | 16 | University of Sharjah UAE |

Source: Times Higher Education for the Arab region, THE 2018

## *10.3 For QS Arab Region Ranking of Top Universities (2018)*

AUB came out first followed by KFUPM (SA) 2nd, KSU (SA) 3rd, KAU (SA) 4th, UAE University 5th, AUC (Egypt) 6th, Qatar University 7th, University of Sharjah (UAE) 8th, University of Jordan 9th, Sultan Qabus University 10th as shown in Table 8.

### 10.3.1 QS Arab Regional Ranking of Universities (2018)

- Two hundred fourteen universities from 16 Arab countries were carefully evaluated by QS.
- Universities from those Arab countries have improved data collection exercises.
- As a results new regional leader emerged, as Sultan Qabus University.

**Table 8** QS Arab region ranking of top universities 2018

| Arab region ranking | University | Overall score | Academic reputation | Employer reputation | Faculty student | International faculty | International students | Faculty staff with PHD | Web impact | Papers per faculty | Citations per papers |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | American University of Beirut (AUB) | 100 | 99 | 100 | 95.7 | 74.4 | 80.5 | 97.8 | 99 | 96.6 | 87.1 |
| 2 | King Fahd University of Petroleum & Minerals (KFUPM) | 99.2 | 99.9 | 96.4 | 100 | 90.1 | 64.2 | 70.8 | 93.6 | 100 | 98 |
| 3 | King Saud University (KSU) | 99 | 100 | 95.1 | 99.7 | 70.6 | 32.9 | 99 | 100 | 97.9 | 86.1 |
| 4 | King Abdul Aziz University (KAU) | 97.5 | 99.8 | 86.2 | 96.5 | 73.2 | 79.1 | 80.8 | 100 | 98.9 | 99.5 |
| 5 | United Arab Emirates University | 93.7 | 97.1 | 83.2 | 89.4 | 95.2 | 85.9 | 100 | 84.2 | 95.8 | 84.4 |
| 6 | American University in Cairo | 90.8 | 99.8 | 98.7 | 79.7 | 55.1 | 13.3 | 93.4 | 98.5 | 83.2 | 36.1 |
| 7 | Qatar University | 89.7 | 87 | 76.3 | 94.1 | 96 | 99.9 | 100 | 88.2 | 91.4 | 65.2 |
| 8 | American University of Sharjah | 87.7 | 98.4 | 98.5 | 57.9 | 99.9 | 100 | 100 | 53 | 98.3 | 75.5 |
| 9 | University of Jordan | 84.4 | 97.6 | 73.7 | 55.6 | 15.2 | 51.6 | 100 | 98.3 | 56.2 | 44 |
| 10 | Sultan Qaboos University | 83.9 | 83.1 | 99.9 | 94.9 | 88.6 | 10.6 | 100 | 69.6 | 96.6 | 63.2 |
| 11 | Cairo University | 80.9 | 100 | 99.9 | 49 | 2.1 | 16 | 73.5 | 99.5 | 32.5 | 54.7 |

(continued)

**Table 8** (continued)

| Arab region ranking | University | Overall score | Academic reputation | Employer reputation | Faculty student | International faculty | International students | Faculty staff with PHD | Web impact | Papers per faculty | Citations per papers |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | University Saint-Joseph De Beyrouth | 76.3 | 70 | 90.2 | 97.2 | 31.7 | 20.2 | 32.4 | 82.8 | 22 | 59.4 |
| 13 | University of Baghdad | 75.9 | 97.8 | 75.6 | 87 | – | – | 85.6 | 50.6 | – | 35.4 |
| 14 | Jordan University of Science and Technology | 75.5 | 93.8 | 94.6 | 50.3 | 6.8 | 77.3 | 74.4 | 48.1 | 42 | 62.3 |
| 15 | Alexandria University | 74.7 | 97.2 | 97.6 | 35.8 | 1.5 | 9 | 69.4 | 87 | 18.8 | 59.7 |
| 16 | Lebanese American University | 73.6 | 71.6 | 94 | 60.9 | 61.8 | 72.2 | 66.4 | 59.3 | 42.2 | 78.9 |

Source: QS Ranking for the Arab region, 2018

### 10.3.2 QS Methodology (2018)

- Capture elements more central to university mission.
- Robustness of metrics reliant on bibliometric data.
- Two indicators are central:

  1. Papers per faculty measures research output.
  2. Citations per paper measures research impact.

- Medicine, engineering and life sciences produce far greater number of citations, than those from English, Languages and other subjects in the Humanities.
- Two center pieces in Arab ranking:

  – *Academic reputation* (30%)
  – *Employer reputation* (20%), to prepare graduates for growing economies.

- Faculty-student ratio is used for quality teaching (20%).

## *10.4 QS Overview of Arab Region University Rankings (2018)*

- AUB is the new regional leader (2018).
- AUB is the oldest in the Arab region after Al-Azhar University in Egypt.
- AUB reputation indicator among employers and alumni was strongest and the highest among alumni and employers.
- Seven universities from Lebanon have been ranked in the top 50 in the Arab region and the nation's lowest-ranked institution was Beirut Arab University.
- Saudi Arabia remains the national strongest performer, with three of its universities in the top four: KFUPM, KSU, KAU.
- There is a gap in research output between universities in the region and others in the world.
- QS measure of research output refers to 2011–2015, thus it takes sometime for data to appear.
- The American University of Cairo scored highest in international faculty and research indicators, while Cairo University came second high for solid reputation. Egyptian universities achieved high score for employer reputation.
- The top 10 Arab universities for employer-reputation included two from Lebanon and UAE, and one from Jordan.
- UAE has a national reputation for internationally mobile professionals. UAE is the home to 12 institutions of high-repute international faculty and 5 institutions with highest numbers of international students.
- On research, Kalifa University, American University of Sharjah, and UAE University lead their peers ranked 2nd, 6th, and 10th respectively in papers per faculty indicator.

- University of Jordan (UJ) remains within the top 10 in the region. University of Jordan scored well in reputation, web impact, staff with Ph.D., and papers per faculty indicator. However, (UJ) was not strong for internationalization metrics or faculty-student ratio indicator, which is also apparent in large national universities across Jordan, Egypt, Algeria, and Palestine. Iraqi Universities are stronger for the faculty-student ratio but scored less for research indicators.
- Qatar University is rising from 9th to 6th with strong results in indicators of web impact 11th and citation per faculty 21st. For web impact, Saudi, Lebanese, Egyptian and Jordanian Universities lead Qatar University (lens of webometrics).
- QS Maple 2018 Middle East annual summit for the advancement of University excellence in all its forms held in Manama, Bahrain, in March 2018, observed a surge in the number of international students choosing to pursue higher education in the Middle East due to the investment of greater resources to advance regional and international rankings.
- There is no doubt that University ranking in the Arab region has enhanced their competitiveness within the region and for the global higher educational market.

## 11 Ranking of Top Universities in Jordan

### *11.1 THE–Times Higher Education Ranking*

The top universities in Jordan in 2018 were Jordan University of Science & Technology (JUST) which came out 1st (World ranked 401–500), University of Jordan (JU) came out 2nd (World rank 801–1000), and Hashemite University came out 3rd (World rank 1001+), as shown in Table 9.

**Table 9** THE-times higher education ranking of top universities in Jordan 2018

| Rank | Name | No. of FTE students | Ratio students per staff | % International students | Ratio Female: Male |
|---|---|---|---|---|---|
| 401–500 | Jordan University of Science Technology Jordan | 23,103 | 12.6 | 20% | 57: 43 |
| 801–1000 | University of Jordan | 31,278 | 16.0 | 14% | 65: 35 |
| 1001+ | Hashemite University Jordan | 24,958 | 25.7 | 4% | 38 |

Source: Times Higher Education 2018

### *11.2 QS Ranking of Top Ten Universities in Jordan*

University of Jordan **(UJ)** came 1st, then Jordan University of Science & Technology (JUST) came 2nd, followed by Yarmouk University (YU) 3rd, Princess Sumaya University of Technology 4th, Hashemite University 5th, University of Petra (UOP) 6th, Applied Science University (ASU) 7th, German Jordanian University 8th, Philadelphia University 9th, and Al-Zaytoona University 10th, as shown in Table 10.

There is similarity in the evaluation and assessment of UJ, JUST, and Hashemite Jordanian Universities in the criteria of THE and QS indicators & standards. If we add Yarmouk University that appeared 3rd in the QS ranking, then those four public universities dominate higher education in Jordan.

Private universities appear only on the QS rankings, where Princess Sumaya University is leading, followed by Petra (UOP), Applied Science University, Philadelphia, and Zaytoona as shown in Table 10.

## 12 Jordanian Ranking: New System for Universities 2016–2017, Criteria and Procedures

The Jordan Accreditation and Quality Assurance Commission for Higher Education Institutions [21] developed five performance criteria, which are in line with leading international rankings (particularly Shangahai, QS and Times Higher Education) and will lead to excellence: teaching and learning (score 250), scientific research (score 250), internationalization (score 150) quality of graduates (score 200), academic accreditation (score 150), as shown in Table 11. An overall score which is calculated as the sum of the scores in all 29 indicators out of 1000 scores (Table 11).

## 13 Results of Jordanian Academic Ranking of Universities 2017

The outcome of the overall ranking of Jordanian Universities (Table 12) was officially announced for the first time in December 2017, with five stars as the highest rank and one star as the lowest rank after implementing the criteria and indicators in Table 11.

However, due to political pressure from the Jordanian Parliament, the Commission was forced to cancel the ranking outcome and delay the process for 5 years to give a better chance for those universities who did not make it in the first round.

As shown in Table 12, Four Universities received the highest ranking of five stars among Jordanian Universities: University of Jordan, German-Jordanian University, Princess Sumaya University for Technology and Jordan University of Science & Technology, as shown in Table 12. Three Universities received the four stars in the

**Table 10** QS ranking of top Jordan universities 2018

| Arab region ranking | University | Overall score | Academic reputation | Employer reputation | Faculty students | Intl. faculty | Intl. students | Faculty staff with PHD | Web impact | Papers per faculty | Citations per papers |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | University of Jordan (UJ) | 84.4 | 97.6 | 98.5 | 55.6 | 15.2 | 51.6 | 100 | 98.3 | 56.2 | 44 |
| 14 | Jordan University of Science and Technology (JUST) | 75.5 | 93.8 | 94.6 | 50.3 | 6.8 | 77.3 | 74.4 | 48.1 | 42 | 62.3 |
| 29 | Yarmouk University (YU) | 56.2 | 78.8 | 62.8 | – | 4.3 | 34 | 99.6 | 66.7 | 40.1 | 24.7 |
| 46 | Princess Sumaya University of Technology (PSU) | 43.3 | 40.2 | 53.6 | 38.8 | 17.5 | 49.1 | 94.6 | 25.3 | 41.8 | – |
| 48 | The Hashemite University (HU) | 42.3 | 57.2 | 49.7 | – | 3.5 | 14.3 | 41 | 34.5 | 65.7 | 53.4 |
| 61–70 | University of Petra (UOP) | – | 30.6 | 28.4 | – | 16.3 | 90.4 | 96.4 | 46.8 | 20.4 | – |
| 71–80 | Applied Science Private University (ASU) | – | – | 15.9 | 47.5 | 25.6 | 100 | 94.8 | – | 28.4 | 44.7 |
| 71–80 | German Jordanian University (GJU) | – | 15.9 | 28.7 | 54.5 | 38.9 | 55.3 | – | 19.5 | 38.7 | 49.1 |
| 71–80 | Philadelphia University of Jordan (PU) | – | – | 20.5 | 29.1 | 26.4 | 99.8 | 90.5 | 61.7 | 18.7 | 24.2 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 81–90 | Zaytoona University of Jordan (ZU) | – | – | 16.1 | 38.1 | 12.7 | 80.8 | 62.5 | – | 10.2 | 89.8 |
| 81–90 | Amman Arab University (AAU) | – | – | 13 | 60 | 13 | 95.5 | 100 | – | – | – |
| 91–100 | Balqa Applied University (BAU) | – | – | 20.8 | – | 34.8 | 12.7 | 53.1 | 55.1 | 24.7 | 35 |
| 91–100 | Ahliyya Amman University (AAU) | – | – | 20.3 | – | 36.1 | 100 | 98.8 | 25.5 | 18.6 | – |

Source: Qs Ranking 2018

**Table 11** Jordanian ranking criteria for universities (Accreditation and Quality Assurance Commission of Jordan 2016–2017)

| No. | Indicator | Score |
|---|---|---|
| **Criterion one: teaching and learning (score: 250)** | | |
| 1–1 | Ratio staff to students | 50 |
| 1–2 | Academic load | 50 |
| 1–3 | Electronic-blended learning | 50 |
| 1–4 | Academic degrees | 25 |
| 1–5 | Admission policy | 25 |
| 1–6 | Student satisfaction | 50 |
| **Criterion two: scientific research (score: 250)** | | |
| 2–1 | Graduate studies programs | 40 |
| 2–2 | Research citations | 40 |
| 2–3 | Research output per staff member | 40 |
| 2–4 | External funding for scientific research projects | 35 |
| 2–5 | Scientific research allocations per staff member | 35 |
| 2–6 | Full-time researchers | 30 |
| 2–7 | Patents | 20 |
| 2–8 | Refereed scientific journals | 10 |
| **Criterion three: internationalization (score: 150)** | | |
| 3–1 | International students | 20 |
| 3–2 | Visiting students | 20 |
| 3–3 | Members of the editorial boards of international journals | 15 |
| 3–4 | Foreign teaching and research staff members | 20 |
| 3–5 | Sabbatical leaves at international universities | 15 |
| 3–6 | Research output published in the proceedings of international conferences | 20 |
| 3–7 | Joint research | 20 |
| 3–8 | Joint or hosted teaching programs | 20 |
| **Criterion four: quality of university graduates (score: 200)** | | |
| 4–1 | Employers' knowledge of graduates' reputation | 75 |
| 4–2 | Ratio of Graduates' employment | 75 |
| 4–3 | Ratio of Graduates' enrollment in graduate studies programs | 50 |
| **Criterion five: academic accreditation (score: 150)** | | |
| 5–1 | Local Quality Assurance Certificate for the university | 40 |
| 5–1 | Rankings and international Quality Assurance Certificates for the university | 40 |
| 5–3 | Local quality assurance certificate for academic programs | 35 |
| 5–4 | External accreditation and quality assurance certificates for academic programs | 35 |

Source: Accreditation and Quality Assurance Commission for Higher Education Institutions (2017). Jordanian Ranking for Universities Criteria & Procedures, 2016–2017. Amman, Jordan

**Table 12** Analysis of the classification (ranking) of Jordanian Universities (2017)

| Rank | University<br>Tags<br>%<br>Stars | Category – stars at the University level | Education and learning<br>300 tags within 5 indicators<br>%30 | Research<br>300 tags within 6 indicators<br>%30 | International dimension<br>100 tags within 5 indicators<br>%10 | Quality graduates<br>150 tags within 3 indicators<br>%15 | Academic accreditation<br>150 tags within 4 indicators<br>%15 |
|---|---|---|---|---|---|---|---|
| 1 | University of Jordan | **5** | 5 | 4 | 3 | 5 | 2 |
| 2 | German Jordanian University | **5** | 5 | 4 | 5 | 5 | 1 |
| 3 | Princess Sumaya University for Technology | **5** | 5 | 4 | 4 | 5 | 2 |
| 4 | Jordan University of Science & Technology | **5** | 5 | 5 | 4 | 4 | 4 |
| 5 | Hashemite University | **4** | 4 | 4 | 2 | 4 | 2 |
| 6 | University of Petra | **4** | 4 | 2 | 3 | 4 | 4 |
| 7 | Applied Science University | **4** | 4 | 2 | 4 | 4 | 1 |
| 8 | American University of Madaba | **3** | 5 | 2 | 2 | 4 | 1 |
| 9 | Balqa Applied University | **3** | 4 | 3 | 1 | 5 | 1 |
| 10 | Aarqa National University | **3** | 5 | 1 | 3 | 3 | 1 |
| 11 | Zaytoonah University of Jordan | **3** | 4 | 1 | 4 | 4 | 2 |
| 12 | Middle East University | **3** | 5 | 1 | 4 | 4 | 1 |
| 13 | Yarmouk University | **3** | 5 | 2 | 1 | 3 | 1 |

(continued)

**Table 12** (continued)

| Rank | University<br>Tags<br>%<br>Stars | Category – stars at the University level | Education and learning<br>300 tags within 5 indicators<br>%30 | Research<br>300 tags within 6 indicators<br>%30 | International dimension<br>100 tags within 5 indicators<br>%10 | Quality graduates<br>150 tags within 3 indicators<br>%15 | Academic accreditation<br>150 tags within 4 indicators<br>%15 |
|---|---|---|---|---|---|---|---|
| 14 | Amman Arab University | **3** | 5 | 1 | 3 | 4 | 1 |
| 15 | Mutah University | **3** | 4 | 3 | 1 | 4 | 1 |
| 16 | Isra University | **2** | 4 | 1 | 3 | 4 | 1 |
| 17 | Hussein Bin Talal University | **2** | 4 | 2 | 1 | 3 | 1 |
| 18 | Albayt University | **2** | 4 | 2 | 1 | 4 | 1 |
| 19 | Jerash University | **2** | 4 | 1 | 3 | 3 | 1 |
| 20 | Ahliyya Amman University | **2** | 4 | 1 | 4 | 3 | 1 |
| 21 | Philadelphia University | **2** | 4 | 2 | 4 | 3 | 1 |
| 22 | Irbid National University | **1** | 4 | 2 | 2 | 1 | 1 |
| 23 | Tafila Technical University | **1** | 4 | 1 | 1 | 3 | 1 |
| 24 | The World Islamic Sciences & Education University | **1** | 4 | 1 | 2 | 4 | 1 |
| 25 | Jadara University | **1** | 4 | 1 | 2 | 2 | 1 |
| 26 | Ajloun National University | **1** | 5 | 1 | 1 | 1 | 1 |

next category: Hashemite University, University of Petra, and Applied Science University. Eight Universities received three stars in the 3rd category; Six Universities received two stars in the 4th category; and five Universities received one star in the 5th category (Table 12).

In conclusion, ranking of universities at the global, regional, and local levels will lead to competition among higher institutions for quality in teaching/learning, research and innovation and the delivery of the vehicles for development, and we have to take the process seriously at all levels.

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# Quality Assurance in the Arab Region in the Era of Customization: Where Do We Stand in Terms of Relevance?


**Susanna Karakhanyan**

**Abstract** A major paradigm shift from standardization to the customization era has posed a whole range of challenges in terms of relevance of higher-education (HE) in general and that of quality assurance, in particular. With everlasting changes, the role of quality assurance (QA) in HE is rapidly expanding to move from its initial purpose of ensuring credibility and trust to also ensure relevance of HE provisions and, most recently, the issues of recognition of the HE outcomes and outputs. On top of considering the diversity of needs resulting from globalization and the ICT revolution, to be a success, the needs of a specific system should be considered at a diversity of levels, including but not limited to subject-specific, institutional, system-wide, national and regional levels to name but a few. To ensure the HE systems are relevant and cover the diversity of provisions in the increasingly customized environment, multiple and diverse measurement tools need to link and lead to the solution of a range of system needs.

The article takes a stock of the last decades of developments in the HE and QA provisions in the Arab region through a critical reflection on the relevance of those provisions to the diverse socio-economic needs. It also endeavors to critically analyze the existing QA systems in the Arab region in terms of international comparability and national suitability. Overall, the HE system in the region is characterized as booming in terms of diversification, including transnational provisions as the major trend. On the other hand, the QA systems seem to be successfully completing their establishment phase and are currently in a transition to revise and introduce a more customized system to coherently link the QA mechanisms with the set priorities at a diversity of levels. One of the major findings in terms of relevance is the further need to link the national qualifications frameworks in the region with respective QA tools to promote relevance and ultimate recognition of the qualifications offered nationally, regionally, and internationally. To promote relevance and recognition, a need to move from input- and process-based mechanisms to more outcome-based approaches seems to be tangible. Recognition of external QA

S. Karakhanyan (✉)
International Network of Quality Assurance Agencies in Higher Education, Barcelona, Spain
e-mail: president@inqaahe.org



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_10

systems against robust international criteria needs to lead the priority list on the agenda of governments if outcomes of the QA are to lead to international recognition of the HE systems and awarded qualifications, in particular.

**Keywords** Internal quality assurance · External quality assurance · Subject-specific reviews · Relevance · Recognition of qualifications · Standardization · Customization era · Diversification of HE

## 1 Introduction

Education has always been the driving force and the critical success factor for societies throughout history. Just as custom was essential for the tribal societies, land was important to agrarian societies and capital investment was paramount for industrial economies; in the twenty-first century, superior talent is necessary to establish knowledge-based economies the governments strive for. The shift towards a knowledge-based society and economy has increased the need for superior talent embodied by higher education (HE), training, skills, creativity, and innovation capacity. To ensure sustainable economic growth and social development, governments all over the world revise their strategies to emphasize the importance of knowledge development and knowledge transfer (Chart 1).

Higher education has been traditionally considered a key agent for human resource development and thus strongly influences countries' capacity to innovate and become competitive. The transition to a knowledge economy places HE among the sectors that are undergoing an increasingly rapid transformation across dimensions of purpose, content, and methodologies. Globalization, technological developments, social change, increased diversification of demand, and the decades-long trend of ever-increasing costs and very supply-side planning have left HE institutions with multiple challenges and the need to be highly innovative in an educational culture that tends to be wary of change [1]. Thus, the recent developments have evolved into a major paradigm shift from standardization, which is peculiar to the industrial society and economy, to a more advanced level of development, which is knowledge driven, requires customized approach to problem solutions, and is predominantly built around superior talent.

The shift from standardization to customization era has posed a whole range of challenges in terms of relevance of HE provisions in general and that of quality assurance QA), in particular. With ever-lasting changes, the role of QA in HE is rapidly expanding to move from its initial purpose of ensuring credibility and trust to also ensure relevance of HE provisions and, most recently, the issues of recognition of the HE outcomes and outputs. On top of considering the diversity of needs resulting from globalization and ICT revolution, to be a success, the needs of a specific system should be considered at a diversity of levels, including but not limited to subject-specific, institutional, system-wide, national, and regional levels to name but a few. To ensure the HE systems are relevant and cover the diversity of

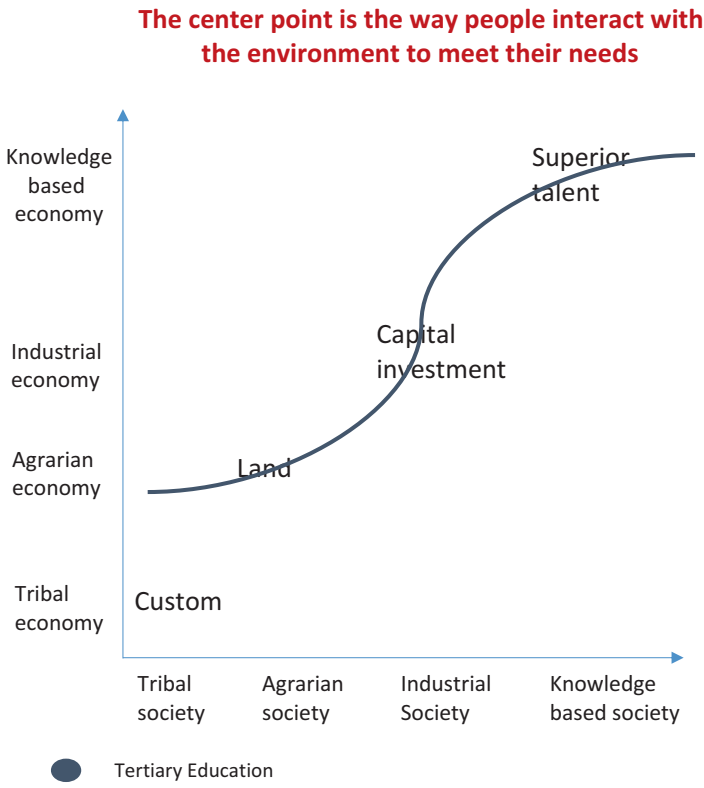


**Chart 1** Evolution: society vs. economy

provisions in the increasingly customized environment, multiple and diverse measurement tools need to link and lead to solution of a range of system needs.

The article takes stock of the last decades of developments in the HE and QA provisions in the Arab region through a critical reflection on the ***relevance*** of those provisions to the diverse socio-economic needs. It does so through an in-depth analysis of the existing QA systems in the Arab region in terms of international comparability and national suitability as well as sets a stage for further deliberation on the effectiveness and efficiency.

## 2 Major Trends Influencing HE Systems

Relevance of QA mechanisms is highly dependent on the extent to which those mechanisms are linked to the solution of a diverse set of needs a system has. To better understand the needs in Arab higher education, it makes a whole lot of sense

to deeper explore the diversity of developmental trends peculiar to the region and look at the fitness of the QA mechanisms to resolve those needs.

To start with the perspectives of a diversity of stakeholders, the following five major trends are identified, each of which bring with them a whole new array of requirements, thus, needs.

- **Government.** With the diminishing trend in the natural resources, governments in the Arab region have a revised approach to education as a key component to a sustainable foundation for economic recovery and long-term health. More and more emphasis is being placed on knowledge development and transfer and tertiary education institutions have found themselves with a new array of demands and expectations placed upon them along with the diminishing public funding. Further, more and more expectations are placed on the success of the entire HE systems to benefit the societies and contribute to economic growth. The majority of governments in the region have significant investments in promoting knowledge development and knowledge transfer at the system level, while putting an extra pressure on the HEI to be listed among the top 200 HEIs in the world.
- **Industry.** With diversification of economy, the demand for diversified workforce is rapidly increasing and acts as a crucial contributor to economic growth. As per the British Council report in 2017 [2], an estimated 75% of the fastest-growing occupations will require STEM-related skills and knowledge (science, technology, engineering and mathematics. The need for an increased emphasis on computer coding, computational thinking, problem solving, and design thinking into all levels of educational institutions is paramount [3, 4]. With the trend being palpable in the economy of the region, the trend that has been registered is for the governments emphasizing the necessity of STEM and setting strategic priorities around its enforcement.
- **Tertiary-education institutions.** Budget cuts on the one hand and increased expectations in terms of establishing a knowledge society alongside unprecedented demands on HE in terms of credibility of provisions and accountability place an extra load on HEIs. HE institutions find themselves in dire need of increased autonomy of operations, revised approaches to teaching, learning, and assessment methodologies to meet the ever-increasing diversity of needs. Additionally, the need to reconsider approaches to formal, informal, and non-formal learning, capitalizing on improved links with industry, research, and development is paramount.
- **Society.** A major shift in the way individuals learn, work, do business, innovate, and entertain themselves is apparent. This entails further diversification of needs, which HE needs to accommodate to ensure inclusive and quality education for all.
- **Students**. What do the direct consumers of TE want? To study and find internships or work placements side by side and to build relationships with future employers? Ideally, integration of academia and industry could be a solution. As per QS Best Student Cities (2018) ranking, “Employer Activity” Index, the cities of London, Tokyo, Melbourne have excellent concentration of national and international companies with strong ties to the university community [5]. However, caution should be taken not to lose the values accumulated in academia

throughout centuries – in the rush for meeting industry demands HEIs should not neglect the basics necessary for knowledge development.

In short, recent developments in the economy of the region requires mobilization of an entire ecosystem that includes a solid **knowledge infrastructure**, a highly **skilled labor force, creative workplaces**, **business models** built with both **customers** and **competition** in mind, and engagement of **global forces.**

The next factor to consider in HE development in the Arab region is rapid diversification of the system in terms of provisions and demands, both vertically and horizontally. In terms of vertical differentiation of the system, governments in most of the countries have put in place a diversity of approaches to ranking, rating, classification, and categorization to better understand performance of each provider, whereas international rankings have been the hot topic on the government agenda with a major ambition to be listed in the top 200. In terms of horizontal differentiation of tertiary-education provisions, at all the levels a diverse range of HE providers, programs, and qualifications is registered, with transnational providers actively invading the region.

Further on the diversification of provisions, Life-Long Learning (LLL; non-formal and in-formal learning) – projected into national qualifications frameworks (NQFs), has been a trend for the last decade; however, clear mechanisms to operationalize LLL and Recognition of Prior Learning (RPL) are yet to be developed and put in place. Along with the latter, on-going learning, e-learning, personalized and adaptive learning are creeping into the systems, thus widening the gap between the provisions and the needs. Thus, diversification of needs generates trends leading to incorporation of a diversity of methodologies and approaches to teaching and learning. Now, to what extent HE in general and QA in particular are ready to accommodate the ever-growing diversity of needs?

In addition to the internal developments, international trends are also high on the agenda of the governments, and the requirements to align with international standards are gaining momentum rapidly. The center of attention at this point is the issue with the global recognition of the HE outcomes and outputs in broader terms. To facilitate the ever-growing migration, qualifications are still the main currency that are in use and signal both national and international value. As of now, readability and recognition of qualifications across the border is still a challenge, namely an absence of a global system of qualifications recognition allowing a learner or worker to take his/her qualifications to other countries and have them recognized. The world is moving towards establishing global recognition of HE qualifications. The UNESCO Global Convention on the Recognition of Higher Education Qualifications will become effective in 2019[1] and special arrangements need to be made to meet the "soft" regulation. However, currently, all the regions all over the world are guided by the Regional Recognition Conventions, which are at different stages of implementa-

[1] UNESCO Global Convention on the Recognition of Higher Education Qualifications Project (to be published in 2019), https://en.unesco.org/themes/higher-education/recognition-qualifications/global-convention

tion at regional and country levels. The UNESCO Convention on the Recognition of Studies, Diplomas and Degrees in Higher Education in the Arab and European States Bordering on the Mediterranean was developed in 1976[2] and has been ratified by only 5 countries out of 22 in the Arab Region [7]. While the regional conventions did not have any focus on quality assurance, in the Global one to be adopted in 2019 quality assurance is one of the major points to be operationalized, which actually entails a major revision of approaches to QA from input and process to outcome based to also allow QA of the qualifications awarded and their recognition.

If we talk about recognition of qualifications, then some elaboration on the qualifications frameworks is necessary. There is growing momentum of setting up National Qualifications Frameworks (NQFs) and cooperation in the use of Qualifications Framework (QF) for cross-border recognition. Over 154 countries all over the world are involved in regional, transnational, and national qualifications frameworks [6]; 35 countries (69%) in Europe out of 51 are working towards comprehensive NQFs covering all types and levels of qualification and by 2018, the 35 countries have formally referenced the NQFs with the European Qualifications Framework [7].

What qualifications frameworks do actually, among other uses, is to provide a transparent context for referencing qualifications and address the need to resolve specific recognition problems. Usually, they are used for certain stipulations in free-trade agreements, become a basis for qualification recognition in intergovernmental and interagency (QA) commitments, multilateral commitments with international or regional agency funding, to name but a few. However, some caution is due not to exaggerate its potential. QFs, as a matter of fact, do not address recognition in the legal meaning of the word and should be taken as a transparency tool for promoting readability of qualifications across the borders. As for quality assurance, clearly it is seen as the main driver for successful operationalization of the QFs and ensuring relevance of the HE provisions to the ever-changing needs.

Thus, through the analysis of the quality assurance developments for the last couple of decades, in this article an attempt is made to look at the QA systems in the Arab region in terms of their relevance, which will be further detailed against such major dimensions as *relevance in teaching and learning* and relevance of QA in terms of addressing *qualifications recognition*, the *knowledge-based economy* ambition set by the countries in the region. Last, but not least, the issue of the *recognition of the QA outcomes* will be discussed as a frame of reference for credibility and trust in the QA provisions in the region. As a basis of analysis, reference will be made to the INQAAHE Global Study,[3] within which a Scoping Study on the Arab Region was made.

[2] http://portal.unesco.org/en/ev.php-URL_ID=13514&URL_DO=DO_TOPIC&URL_SECTION=201.html

[3] The Global Study was initiated by the INQAAHE in 2017 to look at the overall developments and relevance of the QA mechanisms worldwide and the study is in the process of finalization and publication. The Scoping Study in the Arab Region was made in close cooperation with the ANQAHE.

## 3 QA in the Arab Region: The Landscape

The Arab region consists of 22 countries, which are spread over the Middle East and North Africa (MENA) region. QA of HE institutions is a relatively new development as compared to the countries in the western hemisphere. So far, out of 22 countries, 12 countries have established external QA bodies (EQABs) and most of the EQABs were established between 2000 and 2010 with the most recent one being established in Morocco in 2016. The rest are either in the process of establishment or are in the planning process. While QA in the majority of western countries evolved from the HE institutions themselves, in the MENA region, like in many parts of the world where QA of HE is a relatively new phenomenon, QA evolved from government initiatives, mainly as an accountability tool. However, although incremental, efforts are invested to also make use of QA as an enhancement tool.

At the regional level, the organization tending to the issues of promoting, enhancing and developing capacities for quality assurance is the Arab Network of Quality Assurance in Higher Education (ANQAHE) established in 2007. The purpose was to create a mechanism between the Arab countries to:

- Exchange information about quality assurance;
- Construct new quality assurance agencies or organizations;
- Develop standards to establish new quality assurance agencies or support the already present one;
- Disseminate good practice in quality assurance;
- Strengthen liaison between quality assurance bodies in the different countries.[4]

At the international level, almost all the EQABs in the Arab region are members of the INQAAHE – the global, umbrella network for quality assurance in tertiary education and an enhancement platform for QA providers worldwide.

### *3.1 The Nature of QA in the Arab Region*

Compared with the establishment of QA systems in western cultures, where the demand came from the HEIs for such a system, in the Arab region the motion for QA establishment was from the governmental authorities. Predominantly, the EQABs in the region (80%) operate within a single country, and only in one country there are more than one quality assurance bodies established by the government. In terms of independence of operations, majority of the EQABs are placed within government structures, with very few cases of full independence. The major area of EQABs operations is licensure of HEIs and accreditation of programmes and to a lesser extent audits and authorizations are also applied. All the EQABs in the region were developed based on either the USA model of accreditation or sometimes

[4] https://nbaq.edu.kw/en/anqahe/

international guidelines such as INQAAHE GGPs were applied. QA has been seen as one of the major accountability tools for the government and the use of the QA in supporting the HE systems to enhance and meet the socio-economic targets has been scarce. One of the major benefits of the QA throughout the decades, as per the findings, is it has been a major driver of formation and molding of higher education systems, institutions and programmes in the region.

## *3.2 Relevance of QA: Teaching and Learning*

### 3.2.1 External Quality Assurance of HEIs

To better understand the relevance of the QA in teaching and learning, an in-depth analysis of the institutional licensure and programme accreditation criteria has been done. While at the institutional level the criteria are targeting all the necessary dimensions for evaluation, at the programme level the standards and criteria are at generic level across the region. The need for subject-specific evaluations is still covered by international/transnational accreditors, in majority of the cases by those from the USA and Western Europe. Further, in majority of cases one set of criteria is used to conduct all types of procedures – institutional and programme level, with some additional stipulations for each. A further look at the levels of qualifications revealed the criteria and standards for evaluating programmes at different levels are appropriate for programmes at mainly bachelor level, whereas the actual evaluations demonstrate coverage of all the levels – BA/BSc, MA/MSc, and Doctoral – all through one set of criteria. As for the actual nature of the standards for programme accreditation, the main concentration is on the inputs and processes, while outputs in terms of student achievement and learning gain – which are actually the core of teaching and learning success and, ultimately, all that matter – are hardly considered. The same standards are applied also to the HEIs with different legal statuses – for-profit, non-for profit, transnational, government-funded, partnership HEIs and the like. In some countries, the transnational providers are under the purview of different QA bodies.

Further, to better understand the relevance of QA an inquiry was made to what extent the QA covers the diversity of HE provisions and supports the latter to meet the diversity of ever-growing teaching and learning demands, in particular, the extent to which distance and online education were in the center of QA procedures and criteria. As per the results, external evaluation of distance and online learning is still in the inception phase, and a deeper exploration into the applicability of those modes of study, and their quality assurance still needs to be done. In majority of the cases, there was a predominate distrust in the e-learning and distance education itself due to the absence of robust mechanisms to safeguard the systems from frauds and the governments have special policies based on which such provisions and qualifications awarded could be recognized as valid. However, a developmental trend in this direction has also surfaced as around 31% of the respondents stated that they

were planning to introduce policies, criteria, and procedures for evaluating distance education, considering the needs of the country and the trends in the market. In the countries, where distant education and e-learning were supported by the governments the EQABs evaluated distance education through a standard 'core' applicable to all kinds of education and organizations with add-on modules specific to distance or e-provisions. As per the EQABs, the major challenges so far evolve around assuring security management systems for online and distance education and capacity of the HIEs to offer online and distance education through trusted platforms and methodologies.

The next factor influencing the extent of the relevance of the QA mechanisms is the extent of stakeholder involvement in different phases of EQA development, establishment, and operationalization. While governments and HEIs, guided by the international experts and consultants were involved in the development and operationalization of the EQABs, the direct consumers – students, employers and industry at large – do not seem to be a key in the EQA operationalization, thus reducing the chances of constant enhancement of HE provisions through feedback and therefore relevance.

Last, but not least, independence of the QA procedure and decision-making was considered as a factor influencing relevance. The independence of the EQABs was also considered in the final decision-making. In 23% of the cases, the final decision was made by the government, but in 77% of the cases the decision was made by the EQAB Boards, which, in most of the cases is composed of government representatives. In terms of transparency of operations, while in majority of the countries the policies, criteria, and procedures were made publicly available prior to their implementation, none of the countries makes the final reports public.

### 3.2.2 Internal Quality Assurance of HEIs

Internal quality assurance (IQA) of HEIs is a relatively new phenomenon in the region, with the first one being established in the 1990s in Jordan, and 1999 in Iraq. The majority of IQA units in the sample were established between 2006 and 2011, more as a response to the national regulations rather than a demand from within an institution. The primary focus of IQA units or institutional effectiveness offices in the sample is the institution as a whole, its programmes and ensuring compliance with the EQA policies and criteria being as the major function. To a lesser extent, diploma programmes, doctoral programmes, distance education, and e-learning are covered, which is in line with the findings on the EQABs in the region. However, in most of the cases, the policies for IQA were set at the institutional level with little follow up, or there were policies which are not adopted, yet have found their implementation, which actually questions the relevance of the IQA policies and mechanisms in the first place.

With regard to stakeholder involvement in the IQA activities, a distinction between internal and external stakeholders was made. Predominantly, IQA is the business of top-level management, administrative staff, and faculty members,

whereas student and alumni involvement is expressed through participation in the surveys only. With regard to external stakeholders, mainly local governments and employers and international consultants and experts have been identified as having some type of involvement in the IQA.

As for transparency, in majority of the cases the self-evaluation reports done by the HEIs were mainly shared with the government authorities as per request. In some countries publication of the results of the reviews is the norm.

To close the loop, the survey looked at the extent the HEIs and their programmes followed up on the recommendations resulting from the external reviews, but only 55% claimed to comply and to follow up on recommendations. Only 4% claimed that they did not follow up on the recommendations at all. When asked about the reasons for the non-follow up, most emphasized the lack of policies for the follow up, mainly depending on the top management; lack of resources, and non-relevance of recommendations.

The major obstacles for effective operationalization of the IQA were identified as follows:

- Lack of awareness and capacity in basics of IQA;
- Financial constraints;
- Resistance to change;
- Absence of quality culture;
- Issues related to the accuracy and usefulness of the data collected as well as its availability
- Lack of local experts;
- Capacity of faculty and staff involvement.

When asked about the main achievements in the IQA, the majority of respondents emphasized enhancement of resources and structural changes.

As for the QA of distance education, only a blended approach has been a norm and there are only a couple of HEIs in the region that offer full distance education e-learning. As identified by the respondents, the major challenges for provision of e-learning/distance are the need for well-developed tools for recognition of e-learning and the respective degrees/qualifications as well as robust QA mechanisms.

## *3.3 Relevance of QA: Recognition of Qualifications*

To understand the state of art with national qualifications frameworks (NQF) and the links with QA, we looked at the state of affairs in terms of developing, adopting, operationalization, and self-certification of the NQFs in the region. NQF is at its inception phase and out of 22 countries in the region only 6 have fully developed NQFs, two are in the process, and the rest have not started yet. The pioneers in the region were Oman (2003/2004 and the new version in 2017), Tunisia (2009), and the UAE launching it in 2010.

In most cases, the NQFs look at the whole education system providing expected qualifications for all levels through K-12 and up to higher education and lifelong learning (LLL), including Recognition of Prior Learning (RPL). Further, although RPL and LLL are identified in the NQFs, their operationalization is slow in the region and no data were found to attest QA of the LLL and RPL, although some of the systems have embarked on a pilot projects for implementing LLL.

In terms of international recognition of the NQFs in the region, out of the well-established NQFs in the region only two countries have undertaken alignments with foreign NQFs. However, none of the NQFs has undergone a self-certification procedure necessary for international recognition. Activities are in progress to come up with a regional qualifications framework for the Arab region.

As for the links with QA systems, considering NQFs are still a new phenomenon, further investments need to be made to link QA mechanisms with NQFs, and make QA one of the main drivers for NQF implementation and promoting its relevance. As it is currently practiced, the QA criteria and indicators in the region are mainly input and output based and to better see the implementation of the NQF, the criteria need to also address outcomes and recognition of qualifications. Last, but not least, the inquiry into the QA criteria demonstrated lack of relevant tools measuring alignment and achievement of the alignment of the programmes with NQF.

## *3.4 Relevance of QA: Knowledge-Based Economy*

To understand to what extent the QA contributed to the ambitions set by the governments in terms of establishing a knowledge-based economy, we also looked at the QA of research outputs and that of the doctoral programmes.

As the findings demonstrate, both EQABs and IQA systems predominantly focus on QA of teaching and learning, while QA of research and doctoral programmes is not core of the activities in many countries. In the countries where the EQAB does look at research outputs as well, no country has been identified as having special policies and criteria for measuring research outputs and doctoral programmes. Rather, in all the cases where they did look at the component, a standard core applicable to all education levels, and add-on modules specific to doctoral education were common. The purpose of the QA scheme for doctoral programmes varies from system to system, but in the majority of cases the QA provides only for the minimum requirements and is developed based on the national legislation, with no or minimal reference to internationally accepted ones, e.g. Salzburg Principles.[5]

Overall, because of the lack of clear criteria for doctoral programmes in many countries, there is hardly any distinction between professional doctorates and PhD programmes, although both are awarded. Originality of research, lack of skills in developing and delivering relevant doctoral programmes, lack of funding, and

[5] http://www.eua.be/eua/jsp/en/upload/Salzburg_Report_final.1129817011146.pdf

language issues were identified as major challenges for promoting this important aspect contributing to the establishment of a knowledge-based economy.

### *3.5 Recognition of the QA Outcomes: Trust and Credibility*

Last, but not least, the study also looked at the credibility and trust of the QA providers in the region as well as their visibility at the international level. In terms of membership and visibility at the international level: 90% of the members claimed membership with INQAAHE, 10% with ENQA, 80% with ANQAHE, 50% also had membership with other organizations: Association of Quality Assurance Agencies of the Islamic World; CHEA; Gulf Network for Quality Assurance in Higher Education; Quality Beyond Boundaries Group (QBBG).

In terms of trust and credibility, the most commonly adopted approach is either through recognition done by international bodies or audits done by national authorities. The majority of the EQABs are recognized by the country's legislation and to a lesser extent the EQABs in the region are recognized by the HEIs and state authorities but not by law.

As for the international recognition and alignment with the international norms, only 33% of the respondents underwent evaluation against INQAAHE Guidelines of Good Practice (2003) [8], which was a one-run procedure, already expired and needs renewal. As for the current status, a good indicator is that about 46% of the respondents are planning to undergo international recognition procedures, which is a manifestation of commitment to become internationally credible and visible in the long run.

## 4 Conclusions

The HE system in the Arab region is characterized as booming in terms of diversification, including transnational provisions as the major trend. As for QA, it started in the region from government initiatives and the nature of the set policies, procedures, and criteria led in the direction of establishing a compliance culture while creating lags in establishing a quality culture along these lines. This development left the HEIs with little chance to take a full responsibility of QA and thus taking ownership. The bottom line is that QA always succeeds if it is based on a robust internal QA of HEIs and further investments need to be made to ensure the HEIs do build on the capacity to own the QA and the EQABs ensure such an opportunity.

Overall, due to the developments in the region, QA systems seem to be successfully completing their establishment phase and currently in a transition to revise and introduce a more customized system to coherently link the QA mechanisms with the set priorities at a diversity of levels. One of the major findings in terms of relevance is a further need to link the national qualifications frameworks in the region

with respective QA tools to promote relevance and ultimate recognition of the qualifications offered and QA outputs nationally, regionally and internationally. To promote relevance and recognition, a need to move from input- and process-based mechanisms to more outcome-based approach by establishing links to the diversity of needs seems to be inevitable.

In summary, QA of HE in the region needs major reconsideration to serve the diversity of needs, to enhance in terms of efficiency and effectiveness, while addressing the current needs to ensure:

- Recognition of qualifications regionally and internationally;
- Coverage of diversity of HE providers, profiles, performance;
- Measurement of learning outcomes/learning gain;
- Accuracy, availability and usability of the data;
- Links with the labor market and measurement of employability;
- Reduction of accreditation fatigue resulting from the lack of clear, coherent, and comprehensive National Quality Assurance Frameworks – a crucial element for efficiency and effectiveness in operationalization of QA mechanisms.

Last, but not least, the major revisions need to be accompanied with the efforts to promote credibility and trust of the QA systems in the region through undergoing robust international recognition procedures, among the rest.

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# UNESCO Conventions on the Recognition of Higher-Education Qualifications


**Anasse Bouhlal and Peter J. Wells**

**Abstract** With a globalised economy that depends on technical innovations and the competitive use of knowledge by highly skilled individuals, higher education is increasingly seen as vital for a country's economic growth and standard of living. The Sustainable Development Goals (SDGs) agreed in 2015 acknowledge this necessity with the inclusion of a target of ensuring equal access for all women and men to affordable and quality technical, vocational, and tertiary education, including university. However, those seeking to pursue further higher education, or highly skilled work in a different country from that in which they obtained their higher-education qualifications, often experience challenges in having their foreign credentials or studies recognized in the host country. Similarly, individuals returning to their home countries having studied abroad can find that their foreign qualifications are not appropriately recognized.

The Member States of UNESCO's Arab Region recently agreed to revise the Convention for the Arab Region in preparation for an eventual Global Recognition Convention. Both are now advancing towards adoption.

These Conventions incorporate significant new principles such as the granting of recognition unless "substantial differences" are identified, placing the burden of proof on the recognition authority;, fairly assessing qualifications from non-traditional modes of education; placing an emphasis that Parties to the Conventions are responsible for providing information about their higher education and quality assurance systems (particularly through the establishment of a national information center or similar body), and providing special provisions for recognizing the qualifications of refugees.

A. Bouhlal (✉)
UNESCO Regional Bureau for education in The Arab States, Beirut, Lebanon
e-mail: a.bouhlal@unesco.org

P. J. Wells
UNESCO, HQ/Section for Higher Education, Paris, France
e-mail: p.wells@unesco.org



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_11

The revision of the Arab Convention on the Recognition of Higher Education Qualifications, Diplomas and Certificates in relation to Quality-Assurance Systems in the region is discussed.

**Keywords** Academic mobility · Recognition · Higher education · Quality assurance · UNESCO Conventions

## 1 Introduction[1]

The issue of the recognition of degrees and diplomas has been part of UNESCO's activities ever since the beginning of its higher-education programme. Indeed, at the 2nd General Conference in Mexico (1947), when a resolution supporting the programme 'Work with universities' was adopted, one of the six specific objectives was to "address problems of the difference in university degrees across the world".

The initiative to develop normative instruments in the field of academic mobility and the recognition of qualifications started some decades later. At its 66th session, in 1964, the Executive Board requested the Director-General to submit a preliminary evaluation of the technical and legal aspects of the matter. This included the advisability of preparing an international convention or recommendation on the equivalence of secondary school-leaving certificates and of university diplomas and degrees.

Since that date, the concept and nature of the action to be followed by UNESCO has been repeatedly reviewed by successive sessions of its governing bodies. While maintaining the ultimate objective – the preparation of an international standard-setting document – but keeping in mind the various difficulties involved, Member States concluded that the matter could be approached more successfully at the regional level. Consequently, six normative instruments to regulate the mutual recognition of higher education studies and degrees were adopted during the 1970s and the early 1980s, starting with the regional convention on the recognition of studies, diplomas and degrees in higher education in Latin America and the Caribbean (June 1975). This was followed over the next 10 years by four similar conventions covering all regions of the world – the Arab States (1978), Europe (1979), Africa (1981), Asia and the Pacific (1983). Within this framework, the international convention on the recognition of studies, diplomas, and degrees in higher education in the Arab and European states bordering on the Mediterranean (the Mediterranean Convention), which was adopted in December 1976, is the only one of inter-regional coverage.

Nevertheless, this ideal of inter-regional, worldwide mutual recognition of qualifications – UNESCO's initial objective – was not abandoned.

[1] Elements of this paper are taken from an unpublished UNESCO Feasibility Study for a Global Convention on the Recognition of Qualifications in Higher Education, by Lee and Uvalić-Trumbić (2013).

A joint meeting of the five regional and one intergovernmental committee was convened in 1992 in Paris to explore the feasibility of adopting a Universal Convention on the Recognition of Studies and Degrees in Higher Education. However, consensus could not be reached and it was decided to continue to pursue the process at regional level. The aspirations for a world-wide instrument resulted in a normative instrument of a lesser-binding nature: the international Recommendation on the Recognition of Studies and Qualifications in Higher Education adopted by the 27th session of the General Conference of UNESCO (November 1993).

The political changes in Europe in the 1990s, after the fall of the Berlin Wall were one of the reasons for the further regional strengthening of the recognition conventions. European integration in higher education was part of these processes. This resulted in the Council of Europe and UNESCO joining forces to develop a new and stronger joint Convention on the Recognition of Degrees in Europe, the 1997 the Lisbon Recognition Convention. Subsequently, this convention came to play a significant role in the Bologna Process, a unique regional higher education reform.

An Intergovernmental Conference of States (ICS) convened in Tokyo in November 2012, to adopt the revised 1983 Asia-Pacific Convention. The momentum gained through the 'new generation' of conventions stimulated other regions to follow and the revised Asia-Pacific Convention represented a particular landmark in this respect, stemming from the most populous region of the world with rising student and academic mobility both to and from the region.

## 2 Legal Framework

UNESCO's conventions on the recognition of qualifications constitute a unique legal framework in higher education. The five regional and one inter-regional convention have been ratified by 148 Member States (some Member States have ratified more than one convention).

The number of States Parties ratifying by region is as follows:

1974 Regional Convention on the Recognition of Studies, Diplomas and Degrees in Higher Education in Latin America and the Caribbean: 19 States Parties

1976 International Convention on the Recognition of Studies, Certificates, Diplomas and Degrees in Higher Education in the Arab and European States bordering on the Mediterranean: 12 States Parties

1978 Convention on the Recognition of Studies, Diplomas and Degrees in Higher Education in the Arab States: 14 States Parties

1981 Regional Convention on the Recognition of Studies, Certificates, Diplomas, Degrees and other Academic Qualifications in Higher Education in the African States (referred to as the "Arusha Convention"): 29 States Parties

1983 Regional Convention on the Recognition of Studies, Diplomas and Degrees in Higher Education in Asia and the Pacific (1983): 21 States Parties

1993 Recommendation on the Recognition of Studies on the Recognition of Studies and Qualifications in Higher Education (1993)
1997 The Council of Europe/UNESCO Convention on the Recognition of Qualifications concerning Higher Education in the European Region (referred to as the "Lisbon Recognition Convention") (1997): 54 States Parties. This convention replaced the 1979 Europe Region Convention once the number of States Parties to the latter became greater.
2011 Asia-Pacific Regional Convention on the Recognition of Qualifications in Higher Education (referred to as the Tokyo Convention): 6 States Parties – entered into force on February 1st 2018.
2014 Revised Convention on the Recognition of Studies, Certificates, Diplomas, Degrees and Other Academic Qualifications in Higher Education in African States (the Addis Ababa Convention: 15 signatories, 1 State Party. It will enter into force following the 10th ratification
2019 (expected) Revised Convention on the Recognition of Studies, Diplomas, and Degrees in Latin America and the Caribbean
2019 (expected) Revised Convention on the Recognition of Studies, Diplomas and Degrees in Higher Education in the Arab States 1978.

Member States from the Arab Region (ABR) agreed to review the 1978 Regional Convention on the Recognition of Studies, Diplomas and Degrees in Higher Education in ABR. In order to update the text, taking into account present challenges in higher education: international mobility, digital transformation, etc. The agreement on the need to amend the text and on the mechanism to be followed was adopted during the consultation meeting of the nominated revision experts on the Recognition of Studies, Diplomas and Degrees in ABR (Sharm-Sheikh, Egypt, 30 March 2017). UNESCO Beirut Office (BO), as Regional Bureau for Education in the Arab States, serves as the Secretariat for the Convention, with technical backstopping from UNESCO Headquarters.

A Working Group for the revision of the Convention, composed of representatives of Member States, was established during this Consultation Meeting. It met twice in Cairo, Egypt (October 2017) and Rabat, Morocco (March 2018) organized by UNESCO Beirut office. At its last meeting the Working Group approved a revised text of the Convention, to be proposed to Member States for adoption in 2019.

## 3 Similarities and Differences Between the Regional Recognition Conventions

The general principles of the conventions are similar, despite some variations in phrasing. Thus, the conventions ultimately contribute to '*preserving and strengthening the cultural identity and diversity of their peoples, and respecting the specific character of their educational systems'* (Arusha Convention, Africa 1981). They acknowledge that '*the right to education is a human right and that higher education (…) represents an exceptionally rich cultural and scientific asset for both individuals*

*and society'* (Lisbon Recognition Convention, Europe 1997). Furthermore, it is noted that recognition constitutes one of the conditions necessary for *"enabling means of education existing in their territories to be used as effectively as possible for the common good"* with a view to *"the promotion of lifelong education, the democratization of education and the adoption and application of an educational policy allowing for structural, economic, technological and social changes and suited to the cultural context of each country* (Regional Convention for Asia and the Pacific 1983).

The six conventions of the older generation (which do not include the 1997 Lisbon Recognition Convention, the 2011 Tokyo Convention, and the 2014 Addis Ababa Convention), regulating mutual recognition of qualifications between States Parties, adopted under the auspices of UNESCO, have the following common elements:

- *The Preamble* which places the conventions in the framework of UNESCO's mission as set out in its Constitutive Act, which is to "contribute to peace and security by promoting collaboration among nations through education, science and culture…" and other guiding principles based on the respect of cultural diversity.
- *The Structure* that consists of the Preamble; I. Definitions; II. Objectives or Aims III. Commitments for Immediate Implementation; IV. Machinery for implementation; V. Cooperation with international organizations; VI. Ratification, Accession and Entry into Force.
- *The Terminology* which shifts the focus from 'equivalence' to 'recognition', because it may not always be feasible to establish an equivalence between diplomas or degrees of different countries, or even of different higher education institutions in the same country, based on the notion of a strict equality, due to the diversity and complexity of courses.
- *The Objectives* are focused on granting mutual recognition of qualifications in higher education between States Parties subject to national legislation, both for purposes of further study and research as well as professional purposes, i.e. access to the labour market*;*
- *The Scope*: At present, the conventions refer to the mutual recognition by States Parties of qualifications issued by institutions which are part of the educational system of a Member State without any reference to qualifications not part of their education system
- *Implementation*: As implementation mechanisms, Conventions have regional committees as statutory bodies that meet at regular intervals, bringing together representatives of States parties to review progress made and obstacles encountered in their implementation every 2 years. Representatives of the States from the region that have not yet ratified the convention are invited as observers. Meetings of regional committees thus have the additional function of promoting debate and reflection. Another function is to "undertake necessary studies required to adapt the objectives of (this) Convention in accordance with the evolving requirement of social, cultural and economic development in the Contracting States" (Arab States Convention).

## *3.1 Disparities Between the Conventions: A Shift of Paradigm*

The Lisbon Recognition Convention, a joint instrument of UNESCO and the Council of Europe, and a result of the European integration movement, marked a paradigm shift in recognition procedures.

### 3.1.1 Shift of Focus in Favour of Applicant: The Principle of "Substantial Differences"

In comparison to UNESCO's conventions from the 1970s and 1980s, the Lisbon Recognition Convention made a significant shift of focus in favour of the applicant in the process of recognition. Applicants are entitled to fair recognition of their qualifications within a reasonable time limit, according to transparent, coherent and reliable procedures; the reasons for refusal have to be stated; the applicant has a right to appeal. Most importantly, recognition should be granted *unless substantial differences* can be shown.

### 3.1.2 Importance of Access to Reliable Information: Networking at Professional Level

In addition, the Lisbon Convention emphasises the importance of information and networking at expert level. Reliable and comparable information became a key factor in the promotion of recognition practices; the role of national information centres became crucial and the networking between them was sanctioned through the formal establishment of the ENIC network[2] that meets annually. In addition to the Intergovernmental Committee as the formal implementation mechanism of the Lisbon Convention, the ENIC network was also formally designated as the implementation arm of the Convention, assuring legitimacy and continuity of the information provision within the Network, as well as sharing expertise on issues of common interest for a fair recognition of qualifications. Providing information on the national criteria and procedures which are used in the process of assessing higher education qualifications for the purposes of recognition is a specific request of the Convention.

[2] The European Network of National Information Centres (ENIC Network) was formally established in Budapest, in June 1994, merging the existing UNESCO network of the National Information Bodies (NIBs) and the Council of Europe network of the National Equivalence Information Centres (NEICs). It promoted strong cooperation links to the related network of National Academic Recognition Information Centres (NARICs) of the European Commission.

### 3.1.3 Focusing on Recognition for Further Study and Leaving Out Professional Recognition

Unlike the conventions of the older generation which covered both recognition for further study (academic recognition) and for professional purposes (access to the labour market) the Lisbon Recognition Convention and the Tokyo Convention deal with academic recognition only.

### 3.1.4 Subsidiary Texts

Though it offered a solid legal framework, the Lisbon Recognition Convention also promoted recognition practices through instruments of a lesser-binding nature, such as Codes of good practice or recommendations of working groups, some of the most significant ones being the recommendations on criteria and procedures for the assessment of foreign qualifications; (now being revised in Europe) and the Diploma Supplement/European credit transfer system (E.C.T.S.).

### 3.1.5 Links to Regional Policy Developments

In all regions the trends to harmonization of higher education (i.e. the establishment of Regional Higher Education Areas/Spaces) rely on recognition conventions and regional quality assurance networks as pillars of these developments.

These trends are to a large extent inspired by but different from the Bologna Process in Europe. Launched by a declaration signed by Ministers in 1999, the Bologna Process was aimed at creating a European Higher Education Areas (EHEA) by the year 2010. The Lisbon Recognition Convention is the only legal instrument within the EHEA. The European Guidelines and Standards for Quality Assurance constitute one of the key components of EHEA.

The Latin America and the Caribbean Area for Higher Education (ENLACES) – provides a regional platform for policy dialogue for higher education institutions and other stakeholders with the objective of promoting quality higher education.

The 2009 Cairo Conference on Higher Education in the Arab States had as its theme "Towards an Arab Higher Education Space: International Challenges and Societal Responsibilities" and includes a list of areas where harmonization could be achieved, such as qualifications recognition, quality review and quality assurance.

In Asia and the Pacific, the Declaration of the 20th APEC Economic Leaders' meeting held in Vladivostok in September 2012, calls for integration that includes higher education, particularly focusing on the promotion of policies relating to quality assurance, accreditation and cross-border exchange. The recently adopted 2011 Asia Pacific Convention on the Recognition of Qualifications may constitute an important contribution to the APEC Declaration implementation and other similar regional processes.

In Africa, the African Higher Education Harmonization Strategy and the creation of an African Higher Education and Research Space (AHERS), is taking shape. The process is driven by the African Union Commission and UNESCO, and supported by a number of Pan-African networks. The Arusha Convention remains at the heart of this strategy and has a strong integrative component.

Within the inter-governmental committee for the application of the Mediterranean Convention, a capacity-building pilot project was aimed at creating information centres in the MEDA countries for recognition practices closely linked to quality assurance and accreditation. UNESCO should continue its efforts in this direction.

## 4 The New Dynamics in Higher Education in an Era of Globalisation

A new generation of conventions was inspired by the Lisbon Recognition Convention in Europe, which raised awareness about the importance of such an instrument with its more flexible and pragmatic approaches to recognition. The UNESCO 2002 Global Forum on Quality Assurance, Accreditation and the Recognition of Qualifications recommended such a revision in all regions, and the WTO/GATS frenzy over cross-border higher education further emphasized the need to reinforce the conventions – the only existing legal instruments – as an educational response to including higher education in trade in services.

The moves to revise conventions also expressed the need to respond adequately to the new dynamics in higher education in a more globalised world and the appearance of the Knowledge Society in the twenty-first century, as flagged by UNESCO's 2009 World Conference on Higher Education.

The massification of higher education – described by some researchers as the academic 'revolution' of the twenty-first century – is the most striking of these new dynamics. There are over 165 million students enrolled in higher education worldwide (UIS 2010). Age cohort higher education participation rates in the world as a whole grew from 19% in 2000 to 26% in 2007 (UIS 2010). Globally, enrolments have increased fivefold in less than 40 years. Projections call for global demand for higher education to expand from 97 million students in 2000 to 263 million students in 2025 (UNESCOPRESS 2009; UIS 2011).

It will not be possible to satisfy this rising demand, especially in developing countries, by relying on traditional approaches based solely on public universities. A multitude of new providers of higher education is emerging.

One recent trend is the creation of so-called 'World-Class' Universities that feeds on the developing phenomenon of university rankings, which are undoubtedly influencing governments. At the other end of the higher education spectrum are transition programmes between schools and universities, such as community colleges, which are attracting worldwide attention. They provide access for non-traditional students, offer flexible curricula – include skills-based training, and allow progression to university.

Corporate structures of higher education are also changing. Private higher education is now the fastest growing sub-sector and some 30% of students are enrolled in private higher education institutions globally. Some countries (Japan, South Korea) enrol 80% of their students in private higher education institutions and in parts of Latin America these percentages reach 50%. For-profit higher education is also growing and developing specific business models that have not yet been researched sufficiently because these institutions tend not to operate in a completely transparent way.

Furthermore, higher education is no longer provided solely at national level. Cross-border higher education (CBHE) has shown a steady increase in its different forms, which range from branch campuses and universities offering franchised courses abroad to eLearning across borders.

Open and distance and eLearning is also diversifying. The Open Educational Resources (OER) movement has recently spawned the phenomenon of Mass Open Online Courses (MOOCs). Some consider that MOOCs [12], which involve universities with highly selective admissions procedures opening up some of their courses to the world, are a powerful symbol of the new dynamics of higher education.

The internationalisation of qualifications recognition and quality assurance is a response to the growing policy challenges facing higher education systems and institutions as a consequence of all these trends.

## 5 Inter-regional Academic and Labour Mobility

One important trend in recent years has been increasing international academic mobility, which includes the mobility of students, academics, educational programmes and higher education providers. More than 2.5 million students studied outside their home countries in 2009. Estimates predict the figure to rise to seven million international students by 2020. The flow of international students has reflected national and institutional strategies as well as the decisions of individual students worldwide [1]. The major reasons for overseas study fall into three categories [2]: (i) lack of domestic facilities; (ii) the commercial value of a foreign degree; and (iii) the opportunity to know and experience a foreign country and culture.

Fifteen countries[3] account for 44% of the world's mobile students. Asian countries top the list of sending countries (with 43% of all cross-border students), followed by Europe (35%), Africa (12%), North America (7%), South America (3%), etc. [6]. China ranked first in terms of the number of students abroad, followed by India and Republic of Korea.

With the exception of the North America and Western Europe region, the majority of the outbound students are studying outside the region of their origin. For example, the number of students from East Asia and Pacific studying abroad has increased from 700,999 in 2004 to 945,637 in 2009. About 60% of the one million outbound students are studying outside the East Asia and Pacific region. This shows a great amount of inter-regional student mobility.

[3] The 15 countries are China, India, Republic of Korea, Germany, Japan, France, USA, Malaysia, Canada, Russian Federation, Morocco, Turkey, Italy, Poland, and Hong Kong SAR of China.

Most of the mobile students from different regions are flowing into the North America and Western Europe region. The destinations of international students are dominated by six host countries: USA (21%), U.K. (13%), France (10%), Germany (8%), Australia (8%), and Japan (5%).

Besides inter-regional student mobility, there is also a significant increase in international labour mobility. As a result of student mobility, it is common practice for many university graduates to remain and work in the host countries instead of returning to their home country after completing their overseas studies. This affects many African countries resulting in brain drain. The reasons that stimulate people to migrate are numerous and complex in nature. Workers move to find better employment opportunities and working conditions. While wage differentials are an important incentive, access to higher levels of health and education services, more personal security and generally better quality of life can also be important elements affecting the decision to work abroad [5].

It is interesting to note that international migration from poor, developing countries (the South) to rich, developed countries (the North) represents only 33% of the global total migrants. South-south migration among developing countries is almost the same proportion (32%), and North-North migration is only slightly less (28%). Most South-North migration is headed for Europe and the United States, while North-North migration mainly takes place within Europe and across the Atlantic. As for the South-South migration, most of the migration takes place between neighbouring countries. For example, there has been large movement of workers from Egypt to Jordan, from Indonesia to Malaysia and from neighbouring countries to Argentina [4].

## 6 National and Regional Recognition Information Centers

### *6.1 Information on Recognition*

Information is of key importance in assisting students and those who already hold higher education qualifications to move as freely as possible within the Asia-Pacific region and with the rest of the world. At the same time, information on recognition is equally important in ensuring acceptance of qualifications from other countries. It is also of crucial importance in a number of other contexts, including for further study, for gaining access to regulated professions, and for employment in non-regulated parts of the labour market.

The main problem facing credential evaluators and others called upon to assess or otherwise make use of foreign qualifications is not lack of information per se but lack of authoritative, adequate, relevant, well-targeted, and easily available information.

A key function of the National Information center (NIC) is to provide accurate, reliable, authoritative, and easily accessible information on their own and foreign higher education systems and on the recognition of qualifications.

Regional Conventions on the Recognition of Qualifications in Higher Education require Parties to have a National Information Center (NIC) and Regional Information Centers too. This does not necessarily require a new structure or organization to be formed.

The objectives of NICs are to:

1. Provide information that will assist a NIC to work collaboratively with other NICs in sharing information from their higher education system, which includes:
   (a) A description of their higher education system
   (b) An overview of the different types of HEIs that belong to their higher education system and of the typical characteristics of each type of institution
   (c) A list of recognised and/or accredited HEIs, public and private, that belong to their higher education system, indicating their powers to award different types of qualifications and the requirements for gaining access to each type of institution and programme
   (d) An explanation of their quality assurance mechanisms
   (e) A list of educational institutions located outside their territory that are considered part of their education system
2. Provide information to support the recognition of qualifications by:
   (a) Facilitating access to authoritative and accurate information on the description of their higher education system and qualifications
   (b) Facilitating access to information on the higher education systems and qualifications of the other countries
   (c) Giving advice or information on recognition matters and assessment of qualifications in accordance with national laws and regulations.
3. Promote the use of the:
   (a) UNESCO Diploma Supplement and/or any comparable document produced by their respective HEIs
   (b) UNESCO/OECD Guidelines for Quality Provision in Cross-Border Higher Education and/or any comparable document produced by the Parties' respective HEIs, subject to their respective national laws and regulations.

## *6.2 Format of a National Information Centre (NIC)*

Each country should seek to establish a system, a unit or a center that acts as the single point of contact for providing information on qualifications and higher education systems.

The main objective of having an NIC is to assist in promoting the mobility of students, teachers, and researchers by providing authoritative advice and information concerning the academic recognition of qualifications undertaken in other States. The main users of this service will be HEIs and students and their advisers, parents, teachers, prospective employers and other NICs.

The status, scope, and operation of individual NICs will differ from State to State. In the majority of the States, institutions of higher education are autonomous, making their own decisions with regard to admitting foreign students and exempting them from parts of courses of study programmes based on education undertaken abroad. However, in countries where most higher-education institutions are funded and run by central or regional governments, a NIC may be a division or section of the appropriate government ministry or department.

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# The Diploma Supplement as a Tool for Quality Assurance and Relevance


**Isam Zabalawi and Isil Tumer Floden**

**Abstract** For the present and emerging needs of tertiary students and graduates in the twenty-first Century, the condensed academic transcript is no longer adequate to facilitate equivalency recognition for students transferring internationally for further study or for graduates seeking employment or career progression beyond borders. To meet this gap, a comprehensive Diploma Supplement emerged from a number of international meetings and agreements since the 1980s, in particular the Bologna process, the Lisbon Recognition Convention, the World Declaration on Higher Education for the twenty-first century and the Sorbonne Declaration. Many countries and individual institutions of higher education have now introduced Diploma Supplements, or similar, that provide details such as the level of qualification, mode of study, regarding learning outcomes, knowledge, skills and objectives of the course, grading information and grades distribution. The existence of these comprehensive documents enables other institutions of learning elsewhere to gain a clearer background to previous studies and thereby expedite decisions regarding equivalency. For prospective employers in other countries, the document provides a clearer picture of the learning undertaken by the graduate. Update within the MENA region of such expanded graduation documents has been slow. This chapter provides a historical perspective regarding evolution process toward Diploma Supplements and issues associated broad introduction regionally across the Middle East.

**Keywords** Student employability · International mobility · Learning outcomes and graduate attributes · National qualification framework · Awards recognition

I. Zabalawi (✉) · I. T. Floden
Australian College of Kuwait, Kuwait City, Kuwait
e-mail: i.zabalawi@ack.edu.kw; i.floden@ack.edu.kw



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_12

## 1 Prelude

The vital contribution of higher education institutions (HEIs) to sociocultural and economic development across the world is well-recognized. In their capacity to generate, retain and transmit knowledge throughout generations, HEIs have remained central to shaping the course of societies and developing human capital [1]. The past 30 years in particular have seen unprecedented reforms in higher education worldwide and placed HEIs at the center of global transformation from a post-industrial economy to a knowledge economy [2].

Several landmark developments took place during this period, all with at the heart of their mandate to address the needs of twenty-first century graduates through increasing international mobility and employability in particular. The Diploma Supplement emerged, among other key initiatives, so as to support the common goal of making a qualification more portable and its value more transparent.

Although the Diploma Supplement today is largely associated with Europe and the Bologna Process, this chapter presents that its origins can be traced back to a broader, global concept of international education and that its aims, ambitions, and resulting impact extend far beyond Europe [3]. Specifically, this chapter presents: background information on the origins, history and evolution of the Diploma Supplement (Sects. 2 and 3), the benefits of the Diploma Supplement as experienced by the relevant stakeholders (Sect. 4), a summary of the current approach to the Diploma Supplement in the Arab region (Sect. 5) and the potential benefits of the wider use of the Diploma Supplement as well as recommendations (Sects. 6 and 7).

## 2 Graduation Documents: Necessary, But Not Sufficient

Recognizing the increasing mobility of the graduates, higher education systems worldwide are reviewing their existing graduation documents to improve the recognition of qualifications internationally. Graduates are typically issued with an official degree (award), an academic transcript and a statement from the national higher education authority. These, however, in general give little insight into the skills and attributes acquired, the overall character of an award, the awarding institution, or the higher-education system in the country. Furthermore, the lack of a unified approach for the preparation of these documents even among the HEIs within the same system makes comparability a challenge. There is, therefore, a growing need for an additional formal document as a Launchpad for a student's life after graduation. The Diploma Supplement (DS) is an effort to bridge this gap by presenting in a standard format a more complete picture of a graduate's achievements and abilities on the one hand and the characteristics of the awarding institution on the other.

The DS is an official document – appended to the original qualification – issued to the graduates by the awarding institution. It is essentially a communication tool

for improving transparency concerning a higher education award by describing the nature, level, context, content, and status of the studies undertaken and completed by its holder, as well as the education system that the qualification belongs to.

## 3 The Diploma Supplement: Its History and Evolution

### *3.1 Magna Charta Universitatum*

In 1988, close to 400 heads of universities from across Europe and beyond gathered together in Bologna for the 900th anniversary of the oldest European University and signed the Magna Charta Universitatum (MCU). The MCU, principally, was a declaration of principles that underpin the existence and good governance of universities, notably academic freedom and institutional autonomy. To this day, it serves as a universal inspiration to universities around the world that share the same values and has been signed by 816 institutions from 86 countries [4].

The MCU stipulated that universities had to be autonomous, as well as morally and intellectually independent in order to give their graduates the training that the social and economic future of the society required. Furthermore, to remain relevant in an increasingly international environment, they needed to encourage mobility among students by establishing a framework to recognize the equivalency of degrees obtained elsewhere. This was a crucial first step taken at the time to pave the way for future initiatives, the Diploma Supplement undoubtedly being one, to improve transparency of national and international qualifications.

### *3.2 Learning: The Treasure Within*

In 1996, in the wake of the principles laid down by the Magna Charta Universitatum to safeguard the independence of universities and to ensure that they are able to adopt their systems to the changing societal demands, UNESCO commissioned a report titled “Learning: The Treasure Within”. First of its kind, the report was prepared in search of an educational philosophy better suited for the needs of the graduates in light of the developmental trends of the upcoming twenty-first century.

An important reference for re-conceptualizing education worldwide, “Learning: The Treasure Within” advocated that, to prepare graduates for the challenges the future holds, the education had to be built on four pillars: “learning to know” so as to acquire cognitive tools to comprehend, “learning to do” so as to have required skills to participate in society and the economy, “learning to be” so as to apply self-analytical and social skills to become a well-rounded citizen, and “learning to live together” so as to embrace humanistic and democratic values conducive to living in peace and harmony [5].

Furthermore, likening learning to the heart beat of a society, the report emphasized the significance of "Lifelong Learning", particularly in times characterized by rapid change. By drawing attention to different components of the education system and highlighting the importance of acknowledging the range of opportunities that HEIs offered to their graduates, UNESCO planted the seeds for an improved document, in addition to the traditional graduation documents, that would provide a more comprehensive record of a graduate's achievements.

### *3.3 World Declaration on Higher Education for the Twenty-First Century*

In 1998, UNESCO convened the first ever world conference on higher education that brought together more than 4000 participants from 182 countries, including government officials, members of parliaments, heads of HEIs, academics, students, professional associations, and organizations from various sectors of society. The conference adopted the "World Declaration on Higher Education for the 21st Century" which set in motion an in-depth reform to enhance HEIs' capacity to live with uncertainty, to innovate and to induce change and progress in society [6].

The World Declaration on Higher Education for the twenty-first century established a roadmap for the renewal of higher education that transcended mere economic considerations and incorporated dimensions to educate responsible citizens who would promote sustainable development of societies as a whole [6]. In doing so, it affirmed the commitment of its participants to revitalize higher education to provide graduates with the skills and values needed in all areas of human activity and with opportunities for learning throughout life in order to meet present and future demands of society. Acknowledging that the international dimension of higher education is a crucial part of this transformation process, the Declaration stipulated the need to develop instruments for recognition of studies and for certification of skills, competencies and abilities of graduates. This was yet another step leading to the creation of a new document to facilitate mobility and chances of employability within and between national systems.

### *3.4 Lisbon Recognition Convention*

The developments that took place in the higher-education arena in 1990s, paralleled with the removal of definitive boundaries between countries within Europe, prompted a vision in the international community for the establishment of an open higher-education area. Students studying abroad not only became graduates better

equipped to take on global challenges, but also strengthened intellectual ties between societies. It was against the backdrop of this transformational period that UNESCO first initiated the work on the Diploma Supplement with the objective to improve recognition of qualifications both across Europe and other parts of the world. The Diploma Supplement was prepared by a joint working party comprised of representatives from the European Commission, the Council of Europe and UNESCO. Its use was first specified in the Convention on the Recognition of Qualifications Concerning Higher Education in the Europe Region, Lisbon 1997 (Lisbon Recognition Convention), jointly drafted by the Council of Europe and UNESCO. The name Diploma Supplement was chosen deliberately since the objective was to supplement rather than replace the existing graduation documents, commonly referred to at time as diplomas [7].

The Lisbon Recognition Convention stipulated that periods of study completed and higher education qualifications received in a signatory country would be recognized in another unless they were substantially different. Furthermore, the recognition of a qualification would give equal access to its holder for further study and allow the use of an academic title in the country in which the recognition was sought. All assessments for recognition would need to be made in a non-discriminatory manner by the institutions in the host country and the onus of justifying a decision would remain with the body undertaking the assessment [8]. These stipulations, consequently, carved out an essential role for the Diploma Supplement to ensure that evaluation of a qualification was sound and did not contain any value-judgements. The Convention is currently ratified by 53 countries including member states of the Council of Europe and a number of non-member states [9].

### *3.5 Sorbonne Declaration and Bologna Process*

The Lisbon Recognition Convention laid the groundwork for the Sorbonne Declaration signed by the higher-education ministers of France, Germany, Italy, and the United Kingdom in 1998 and for the Bologna Declaration which was subsequently signed in 1999 by higher-education ministers of 29 countries in Europe. The Bologna Declaration lent its name to the Bologna Progress, arguably one of the most transformative reforms in the history of higher education [2]. The main objectives of this process were to create a European Higher Education Area (EHEA) with comparable and compatible higher-education systems to facilitate cultural integration and mobility, as well as to increase the competitiveness of the European education system so as to attract students and academics alike from the rest of the world. Therefore, from its inception, the objectives of the process extended well beyond Europe [2]. In order to achieve these global ambitions and promote a transparent system of higher education worldwide, the signatories affirmed their support,

among other action lines, to adopt easily readable and comparable degrees through the implementation of the Diploma Supplement. Participants agreed that every student graduating from 2005 onward should receive the document automatically and free of charge, and in a widely spoken European language.

The Bologna Process has reached its milestone with the launching of the EHEA in 2010 and has attracted interest in other parts of the world, not only in Europe. The Diploma Supplement, together with the European Credit Transfer Accumulation System (ECTS)[1] and the National Qualifications Framework,[2] makes up an important component of the "Bologna Toolkit" which is linked closely with many of the Bologna Process action lines [2]. The Bologna Process has currently 48 [10] member countries and its elements serve as references or as models for similar initiatives across the world.

## 4 Why Diploma Supplement?

The Diploma Supplement (DS) has received considerable attention from the various HEI stakeholders over the years, including students, employers, credential evaluators, quality assurance agencies, and as well as from higher-education institutions. It is valued as a public tool of information, prepared in a standard format easily understood by a broad audience, yet sufficiently flexible to adapt to local needs [3]. Divided into eight sections, it contains the following [11]:

- Information identifying the holder of the qualification (the name, the date of birth, and the student identification code of the student, if applicable);
- Information identifying the qualification (the name of the qualification and the title conferred, if applicable);
- Information on the level of the qualification (the place of the qualification in the national educational structure of awards, the duration or the workload of the program, and the access requirements);
- Information on the contents and results gained (the mode of study, details on the learning outcomes, knowledge, skills and objectives of the qualification, actual marks/grades and credits obtained, the grading scheme and the grades distribution, and if applicable, the overall classification of the qualification (e.g. Summa Cum Laude, First Class Honors));
- Information on the function of qualification (access to further studies, and rights to practice or professional status, if applicable);

[1] ECTS is a system developed by European Commission based on learning outcomes and workload, designed to facilitate credit accumulation/transfer and international recognition for periods of study completed aboard [12].

[2] A Qualifications Framework is a formalized structure in which learning level descriptors and qualifications are used in order to understand learning outcomes. Qualifications Frameworks are typically found at the National, Regional, and International level [13].

- Additional information (any additional information that is relevant for assessing the nature, level and usage of the qualification);
- Certification of the supplement (the date the Diploma Supplement is issued, the name and the official post of the individual certifying and the stamp of certification);
- Information on the national higher education system (general access requirements, national qualifications framework if applicable and the quality assurance and accreditations systems).

In the face of cultural, societal, economic, and technological changes taking place, the education systems worldwide are under constant change and new qualifications proliferate. This global trend, alongside the rising number of citizens wanting to study and work abroad, increases the need for efficient, objective mechanisms that aid fair recognition of international academic and professional qualifications. The Diploma Supplement is a powerful response to this demand, as it aims to:

- Promote transparency among different higher education systems;
- Provide accurate information and promote informed judgments about qualifications;
- Accommodate rapid changes in educational structures;
- Facilitate mobility, employability, and access to further education and lifelong learning.

The Diploma Supplement has multiple important gains all for HEI actors and stakeholders by alleviating the problems resulting from poor-evaluation of international qualifications due to the original credentials not providing sufficient information [12]. These gains are summarized below:

**For students,** the Diploma Supplement provides a clear, precise and internationally comparable description of their studies placed in the context of the higher education system in the country. Students have easier access to opportunities of further study or employment both at home and abroad with a more complete representation of their academic work, acquired skills and competencies. Students and student organizations recognize that the information provided about the objectives of a qualification, the rights and competencies that it confers, as well as the information about its surrounding quality assurance mechanisms play an important role in enhancing the transparency of education.

**For HEIs,** the Diploma Supplement is an effective, flexible tool that offers a common approach to evaluation of international qualifications while respecting the autonomy of the institutions and the individuality of national systems. It provides a greater visibility abroad for the institution and enhances the prospects for its graduates. It aids administrative staff when evaluating a qualification and simplifies the admission or exemption process. It helps save time and resources by providing the answers to recurrent queries from employers and education institutions about the nature of their qualifications and institution. For institutions that offer postgraduate study, it also offers an additional fair mechanism to make a judgment regarding the standing and content of particular qualifications.

**For employers,** the Diploma Supplement provides useful information at the time of recruitment or during employment to judge the (potential) employee's knowledge, skills, competencies, and suitability for a position. Information concerning internships, study abroad, and extracurricular activities becomes particularly valuable in the assessment of fresh graduates. Furthermore, gaining better insights into qualifications over time simplify the process of assessing expertise and improve the efficiency of the recruitment and staffing decisions. Employers have access to useful information to understand the possible career paths graduates that pursue upon completion of a certain program.

**For credential evaluators,** the Diploma Supplement is an objective source of information for assessing the academic level and rights of a degree in question, as well as the professional status conferred by it. It presents characteristics that are particularly useful for evaluation of a foreign qualification in establishing the level, duration and entrance requirements and in outlining the national higher-education system of the country.

**For quality-assurance agencies,** the Diploma Supplement is an international device that can contribute to mutual accreditation and evaluation decisions. It sheds light on the quality assurance mechanisms of the awarding institution and is viewed as an outcome of its production process, and a component of its external communication [3].

Additionally, as being implemented in the United Kingdom, there is growing interest in issuing the Diploma Supplement electronically, through a secure system, which releases the document to interested parties, such as potential employers or other HEIs, upon student's discretion. Moreover, the document can be accessed progressively, while the student is studying, and after graduation.

## 5 Current State of Implementation of the Diploma Supplement in the Arab Region

With the emergence of the knowledge-based economy shifting the traditional economic models, HEIs in the Arab region, as in the rest of the world, are assessing their existing practices to ensure graduates are prepared to face socio-economic changes that are taking place [14]. Recognizing the need to reform their higher education systems to align them with international standards, many Arab countries have taken important initiatives, supported by the Erasmus+ program,[3] to install Bologna-inspired structures and quality-assurance mechanisms. These include credit-transfer systems, qualifications framework, and the Diploma Supplement. Algeria, Egypt, Jordan, Lebanon, Libya, Morocco, Syria, Palestine, and Tunisia are

[3] Erasmus+ Program (previously known as TEMPUS) is a European Union (EU) initiative to support higher-education reform in the EU's surrounding area through institutional cooperation with Partner countries [15].

all partner countries in the Erasmus+ program, although not being formally part of the Bologna process.

According to the Overview of Higher Education Reports produced by the EACEA[4] on the basis of contributions from national Erasmus+ offices[5] and other concerned authorities, the following Arab countries are reported to have adopted and/or flexibly implemented a Diploma Supplement:

- **Lebanon:** Upon completion of the qualification requirements, students receive a diploma including the details of the relevant title, average grades and number of credits earned. Each higher-education institution is responsible for the certification of its awards. Although not a national requirement, some institutions also issue a Diploma Supplement-like document including additional information on the studies successfully completed [18].
- **Tunisia:** This country started to implement the Bologna Process in 2006 and formally introduced ECTS, the three-cycle system of study, (i.e. undergraduate, graduate and doctoral studies) and the Diploma Supplement through a new Higher Education Law passed in 2008. Students accordingly are issued with a transcript and the Diploma Supplement in addition to their original award [19].
- **Algeria:** In 2012, more than 75% of the institutions in Algeria were reported to issue Diploma Supplement to their students automatically and free of charge upon graduation [20].
- **Syria:** The Diploma Supplement is issued as an appendix to the original qualification, which includes the professional title and average degree earned. It contains information regarding the level, type, and content of the studies successfully completed [21].
- **Palestine:** A standard template for the Diploma Supplement has been developed with support from Higher Education Reform Experts[6] and is being used by several HEIs in the country [22].

In addition, various workshops and seminars were conducted in recent years related to the Bologna Process, qualifications frameworks and Diploma Supplement with involvement from HEIs and ministry officials, all attesting to the appeal of the implementation of Bologna Process structures in the region.

[4] The Education, Audiovisual and Culture Executive Agency (EACEA) is the agency responsible for managing various programs funded by the EU in the fields of education, culture, audiovisual, sport, citizenship, and volunteering [16].

[5] National Erasmus+ Office in each partner country is the party responsible for the local management of the Erasmus+ program within the country [17].

[6] Higher Education Reform Experts (HEREs) is a group of experts whose activities are sponsored through the Tempus/Erasmus+ program. HEREs offer support in reforming the higher education systems in partner countries in conjunction with the local the National Erasmus+ Offices (NEOs) [23].

## 6 Potential Benefits of the Diploma Supplement in the Arab Region

The problem of poor recognition is widespread and impacts students, HEIs, assessing bodies, and employers all over the world. As citizens become more mobile and the labor markets become more international, there is a growing demand for instruments which will facilitate recognition of periods of study abroad and qualifications issued from diverse education systems, while providing reciprocal benefits for citizens studying or working overseas. Moreover, transparency tools like the Diploma Supplement give recognition to aspects of non-traditional learning, such as work experience or industry training completed as part of the higher-education qualification, which are otherwise not formally acknowledged [24]. Therefore, despite being widely connected with the developments in Europe, the need for issuing a Diploma Supplement type "third document" in order to improve the transparency of qualifications is relevant globally [25].

As in the rest of the world, Arab economies recognize the importance of a more mobile and international workforce in the increasingly competitive environment of today. More citizens in the region are traveling aboard to study and work and seeking recognition for qualifications and skills earned elsewhere upon their return home. According to the Higher Education Statistics Agency (HESA), during the 2013/2014 Academic Year, HEIs in the United Kingdom alone received close to 28,000 students from the Middle East, more than 4% compared to the previous academic year. At the same time, while North America, UK, and Europe continue to attract large number of students from the MENA region, a considerable portion of internationally mobile students from Arab countries stays within the region to pursue studies. Lebanon, Jordan, UAE, Egypt, and Saudi Arabia are all gaining popularity as regional education hubs [26].

According to the 2017 Overview of Higher Education Report, Lebanon has approximately 10,000 students studying abroad every year and 11% of the country's university student population is comprised of foreign students coming from outside [18]. The lack of an effective mechanism for recognition of periods spent abroad is a major challenge for the Lebanese higher-education system that needs urgent attention. Similarly, Egyptian authorities reported for the same year that the number of foreign students coming to study is on the rise, thus raising the need to improve the system for recognition of foreign degrees higher up in the agenda for education reform [27].

A transparency tool like the Diploma Supplement is not only important for increasing international mobility, but also for increasing mobility between the institutions within a country. Use of a Diploma Supplement can facilitate horizontal movement and vertical progression for students within a higher-education system who are looking to change schools during their studies. Countries in the region report that it is unusual for their students to change institutions once they start their

studies due to lack of supporting mechanisms. This leads to duplication of work and loss of money and time for the students [27].

Through establishing greater transparency, other potential benefits for widespread implementation of a Diploma Supplement may include increased drive for institutional improvement, stronger information systems, and processes that contribute to the overall quality of higher-education activities [24]. A strong push for the use of diploma supplement will also prompt the adopting countries to define their own national qualifications framework (NQF). According to the Overview of Higher Education Reports issued in 2017, this is still lacking in many countries in the Arab region or in early stages of adoption [18, 22, 27]. Among many reasons why the establishment of NQFs is crucial are the following:

- To provide a reference point to compare qualifications, whether it may be nationally, regionally or internationally;
- To indicate and have consistency for the required outcomes and demands/expectations of a program set at a particular level;
- To inform the design and development of new qualifications, opening doors for smaller/more flexible units of learning;
- To increase the visibility and enhance international standing of the higher education system in a country.

The use of a Diploma Supplement may also expand opportunities for articulation agreements between HEIs, both locally and internationally. This is of significant relevance for the higher-education environment in the region [24]. A considerable number of Arab colleges and universities have established bilateral cooperation agreements with institutions around world over the years and continue to offer joint or double degrees with the objective of increasing the mobility of their student base and attracting students from outside [18, 22, 27].

## 7 Conclusion

Increasing international student mobility and employability are demands that today's knowledge societies are placing on the HEIs around the world. Expectations from the colleges and universities in the Arab region are not different. The Diploma Supplement provides an opportunity to meet these demands by increasing the transparency of higher education systems and improving the recognition of qualifications.

With growing efforts toward internationalization and modernization of higher-education systems in the region, it is anticipated that Arab countries will receive an increasing number of students coming to study from outside, while on the other hand continuing to see many of their own students leaving to study abroad. The

Diploma Supplement is an important communication tool that will both improve the recognition of foreign qualifications in the Arab region and also benefit students educated in the Arab countries who continue overseas.

It is in this context that there is growing awareness and interest in this part of the world for the use of a Diploma Supplement, even though current level of implementation is hardly sufficient. Optimizing the potential benefits of a Diploma Supplement (or a similar tool) to improve the quality of higher education, as well as the recognition of qualifications, requires more resources and widespread implementation in the region. A lack of commitment on this front may mean the region will find itself falling behind international higher-education developments taking place elsewhere.

It is important to highlight the limitations of the Diploma Supplement and that international recognition is ultimately influenced by the global political order and as well as regulatory measures laid down in the country [3]. The Diploma Supplement, as any other tool for increased transparency, cannot be expected to cover all issues in relation to recognition of qualifications. When assessing the usefulness of a single instrument like the Diploma Supplement, its interplay with other instruments and the contextual (societal, political, economic) factors should always be kept in mind. Against this background, this chapter advocates the use of the Diploma Supplement in the Arab region and argues that as the educational systems worldwide are undergoing rapid change due to shifts in the economical dynamics, HEIs have the responsibility to give their students this powerful tool, free of charge, to promote fair and informed evaluation of their qualifications.

## 8 Diploma Supplement Sample [28]

An example of a Diploma Supplement is included at Attachment 1 to this chapter. It is for a Bachelor of Arts (in Hotel Management) from the American College, Cyprus. Further information with regard to the Diploma Supplement issued from this particular institution is available from the American College Cyprus webpage http://www.ac.ac.cy/en/european-issues/europass.

## Attachment 1: Example of Diploma Supplement from American College Cyprus

# AMERICAN COLLEGE

## DIPLOMA SUPPLEMENT

This Diploma Supplement model was developed by the European Commission, Council of Europe and UNESCO/CEPES. The purpose of the supplement is to provide sufficient independent data to improve the international 'transparency' and fair academic and professional recognition of qualifications (diplomas, degrees, certificates etc.). It is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended. It should be free from any value judgements, equivalence statements or suggestions about recognition. Information in all eight sections should be provided. Where information is not provided, an explanation should give the reason why. http://ec.europa.eu/education/policies/rec_qual/recognition/ds_en.pdf

### 1. INFORMATION IDENTIFYING THE HOLDER OF THE QUALIFICATION

1.1 Family name(s): MICHAEL

1.2 Given name(s): Nicolas

1.3 Date of birth (dd/mm/yyyy): 14/09/1982

1.4 Student identification number or code (if available): 20060014

### 2. INFORMATION IDENTIFYING THE QUALIFICATION

2.1 Name of qualification and (if applicable) title conferred (in original language): Bachelor of Arts in Business Administration

2.2 Main field(s) of study for the qualification: Business Administration

2.3 Name and status of awarding institution (in original language): American College is a private institution of higher education operating in the Republic of Cyprus. It was registered with the Cyprus Ministry of Education and Culture (Registration Certificate No. ISTE 18) after inspection and approval of its facilities, programmes and faculty.

2.4 Name and status of institution (if different from 2.3) administering studies (in original language): Same as 2.3

2.5 Language(s) of instruction/examination: English

### 3. INFORMATION ON THE LEVEL OF THE QUALIFICATION

3.1 Level of qualification: First cycle degree (Bachelor)

3.2 Official length of programme: In full-time mode 4 academic years - 8 semesters (240 ECTS). In part-time mode, the 240 ECTS may be accummulated during a maximum of 9 academic years.

3.3 Access requirements(s): Upper secondary school leaving certificate (Apoletyrion) or equivalent qualification(s). Further information at www.ac.ac.cy.

### 4. INFORMATION ON THE CONTENTS AND RESULTS GAINED

4.1 Mode of study: Full-time attendance

4.2 Programme requirements: The student must satisfy the programme's credit requirements and complete 240 ECTS. Course pass mark is 60%. A minimum Cumulative Grade Point Average (CGPA) of 2.00/4.00 is required for the 1st Cycle Degrees. There is no minimum CGPA for Culinary Arts and Office Administration programmes. Further information at: www.ac.ac.cy

4.3 Programme details (e.g. modules or units studied), and the individual grades/marks/credits obtained

| CODE | COURSE TITLE | SEMESTER | ECTS Credits | Points | Grade |
|---|---|---|---|---|---|
| CSC101 | Introduction to Computing | Summer 2008 | 6 | 6.00 | D |
| ENG101 | English Communication | Summer 2008 | 6 | 15.00 | C+ |
| ENG102 | English Writing | Summer 2008 | 6 | 6.00 | D |
| CSC102 | Computer Applications | Fall 2008 | 6 | 24.00 | A |
| ENG201 | Advanced English | Fall 2008 | 6 | 18.00 | B |
| MGT101 | Principles of Management | Fall 2008 | 6 | 18.00 | B |
| MTH101 | Mathematics | Fall 2008 | 6 | 9.00 | D+ |
| ACC101 | Financial Accounting | Spring 2009 | 6 | 21.00 | B+ |
| ECO101 | Principles of Microeconomics | Spring 2009 | 6 | 9.00 | D+ |
| MAR101 | Principles of Marketing | Spring 2009 | 6 | 12.00 | C |
| MTH102 | Statistics | Spring 2009 | 6 | 6.00 | D |
| PHI101 | Introduction to Philosophy | Spring 2009 | 6 | 21.00 | B+ |
| PSY101 | Introduction to Psychology | Spring 2009 | 6 | 24.00 | A |
| CSC203 | Management Information Systems | Fall 2009 | 6 | 18.00 | B |
| ECO201 | Principles of Macroeconomics | Fall 2009 | 6 | 18.00 | B |
| MAR205 | Public Relations | Fall 2009 | 6 | 18.00 | B |
| MGT203 | Management Theory and Practice | Fall 2009 | 6 | 18.00 | B |
| MGT302 | Organizational Behavior | Fall 2009 | 6 | 21.00 | B+ |
| ACC201 | Financial Accounting II | Spring 2010 | 6 | 24.00 | A |
| FIN101 | Principles of Financial Management | Spring 2010 | 6 | 18.00 | B |
| MAR204 | Consumer Behavior | Spring 2010 | 6 | 24.00 | A |
| MAR308 | Strategic Marketing | Spring 2010 | 6 | 21.00 | B+ |
| MGT201 | Production and Operational Management | Spring 2010 | 6 | 21.00 | B+ |
| ACC401 | Managerial and Cost Accounting | Fall 2010 | 6 | 24.00 | A |
| MGT206 | e-Business | Fall 2010 | 6 | 24.00 | A |
| MGT401 | International Business | Fall 2010 | 6 | 24.00 | A |
| MGT402 | Human Resource Management | Fall 2010 | 6 | 18.00 | B |
| MGT404 | Business Ethics | Fall 2010 | 6 | 24.00 | A |
| MTH204 | Statistics II | Fall 2010 | 6 | 9.00 | D+ |
| SOC101 | Principles of Sociology | Fall 2010 | 6 | 24.00 | A |
| ECO301 | International Economics | Spring 2011 | 6 | 21.00 | B+ |
| FRE101 | French Language | Spring 2011 | 6 | 24.00 | A |
| HST102 | History of Cyprus | Spring 2011 | 6 | 6.00 | D |
| MAR203 | International Marketing | Spring 2011 | 6 | 21.00 | B+ |
| MGT303 | Management Science | Spring 2011 | 6 | 24.00 | A |
| MGT403 | Business Policy and Strategic Management | Spring 2011 | 6 | 24.00 | A |
| MTH201 | Finite Mathematics | Spring 2011 | 6 | 21.00 | B+ |
| GRE101 | Modern Greek | Fall 2011 | 6 | 12.00 | C |
| HOT101 | Introduction to the Hospitality Industry | Fall 2011 | 6 | 24.00 | A |
| TOU110 | Dimensions of Tourism | Fall 2011 | 6 | 24.00 | A |
| | | Total ECTS credits: | 240 | | |
| | | Cumulative Grade Point Average (CGPA): | 3.08 | | |

4.4 Grading scheme and, if available, grade distribution guidance

| Grade | Course Grade/ Grade Meaning | Grade Points per Credit |
|---|---|---|
| A | 90-100 | 4.00 |
| B+ | 85-89 | 3.50 |
| B | 80-84 | 3.00 |
| C+ | 75-79 | 2.50 |
| C | 70-74 | 2.00 |
| D+ | 65-69 | 1.50 |
| D | 60-64 | 1.00 |
| F | 0-59 | 0.00 |
| W | Withdrawal | 0.00 |
| I | Incomplete | 0.00 |
| TR | Transfer Credits | 0.00 |
| AU | Audit | 0.00 |

Bachelor and Master degree graduates are awarded for high academic achievement as follows:

- Summa Cum Laude: awarded to students whose CGPA is between 3.90 and 4.00.
- Magna Cum Laude: awarded to students whose CGPA is between 3.70 and 3.89.
- Cum Laude: awarded to students whose CGPA is between 3.50 and 3.69.

The Cumulative Grade Point Average (CGPA) is the sum of the product of the "Grade Points per Credit" and the number of ECTS of each course taken, divided by the total number of ECTS earned. Further details at www.ac.ac.cy

4.5 Overall classification of the qualification (in original language)

Pass - 3.08 out of 4

## 5. Information on the function of the qualification

5.1 Access to further study

Access to second cycle (postgraduate) studies.

5.2 Professional status (if applicable)

Not applicable

## 6. Additional information

6.1 Additional information

Students generally must not take more than 60 ECTS in one academic year. A student may take more than 60 ECTS in one academic year if one or more of the following reasons apply:

1. The student was granted permission for additional ECTS due to his/her high academic performance;
2. The student has repeated a course that he/she previously failed;
3. The student has repeated a course in order to improve his/her CGPA;
4. The student has repeated a course that he/she has transferred; and
5. The student had to take additional ECTS in order to graduate after a specific semester

6.2 Further information sources

American College:

www.ac.ac.cy

Cyprus Ministry of Education and Culture:

www.moec.gov.cy

## 7. Certification of the supplement

7.1 Date of issue

29/02/2012

7.2 Name and Signature

Nicolas Ioannides

7.3 Capacity

Registrar

7.4 Official stamp or seal

## 8. Information on the National Higher Education System

The Education system in Cyprus consists of the following stages:

**Pre-Primary education:**
Pre-Primary Education is compulsory for all children between 4 8/12 – 5 8/12 years old. Children are also accepted over the age of 3. This level of education aims to satisfy the children's needs for the development of a wholesome personality in an experiential environment which enables them to recognize their capabilities and enhance their self-image.

**Primary Education:**
Primary education is compulsory for all children over the age of 5 8/12 and has a duration of 6 years. The aim of Primary Education is to create and secure the necessary learning opportunities for children regardless of age, sex, family and social background and mental abilities.

**Secondary Education:**
Secondary General Education offers two three-year cycles of education – Gymnasio (lower secondary education) and Lykeio (upper secondary education) – to pupils between the ages of 12 and 18. The curriculum includes core lessons, interdisciplinary subjects and a variety of extracurricular activities.
Instead of the Lykeio, pupils may choose to attend Secondary Technical and Vocational Education which provides them with knowledge and skills which will prepare them to enter the workforce or pursue further studies in their area of interest.

**Higher Education:**
At present, public and private universities operate in Cyprus.

**Public Universities**
1. The University of Cyprus
2. The Open University of Cyprus
3. The Cyprus University of Technology

**Private Universities**
1. European University- Cyprus
2. Frederick University- Cyprus
3. Neapolis University- Cyprus
4. University of Nicosia- Cyprus

**State Higher Education Institutions:**
Higher education in Cyprus is also provided by a number of State Higher Education Institutions, and an even greater number of Private Institutions of Higher Education, none of which has university status. The State Institutions of Higher Education, offer vocational programmes of study with a duration ranging from one to three academic years. These programmes do not provide access to second cycle programmes. The apolyterion or equivalent qualification, is a prerequisite for access to the programmes offered by State Higher Education Institutions and candidates for entrance to a particular programme are ranked according to their performance in the Pancyprian Examinations.

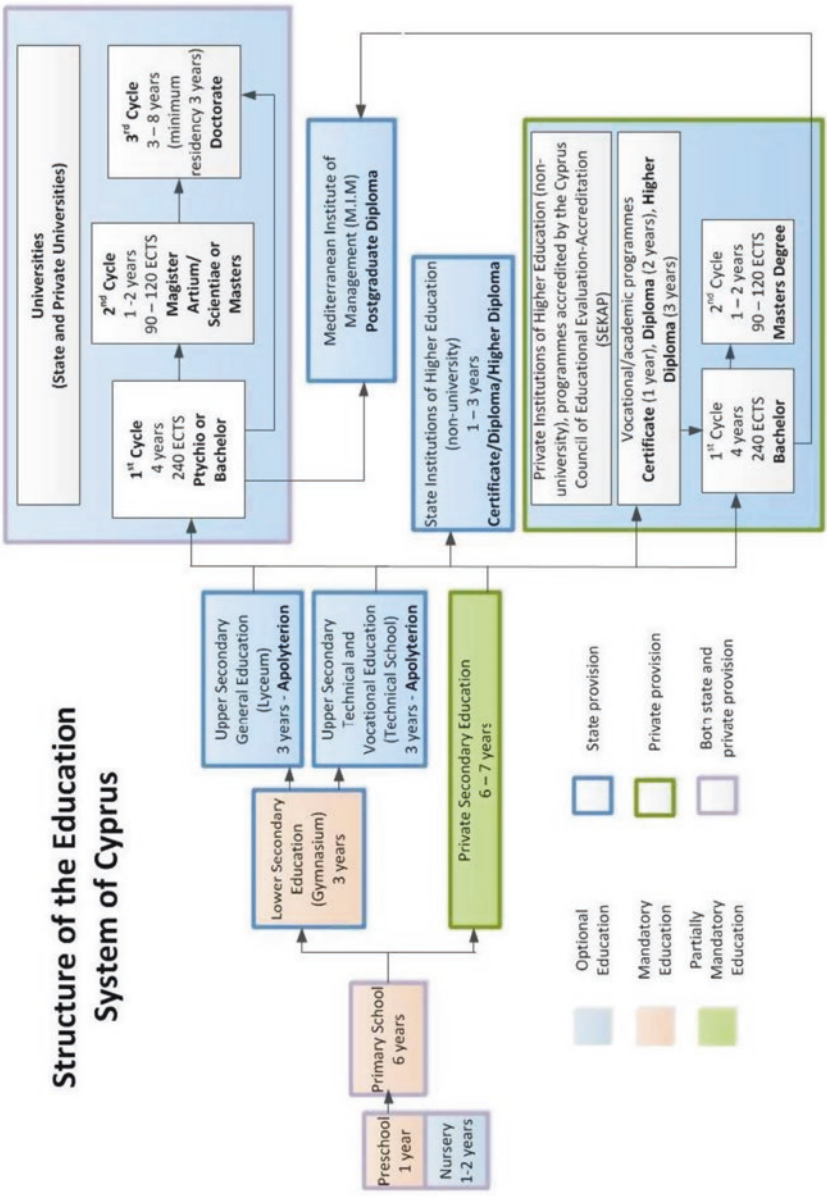
**Private Institutions of Higher Education:**
Currently, 25 Private Institutions of Higher Education are registered with the Ministry of Education and Culture some of which have branches in other cities in Cyprus, besides Nicosia. Private Institutions of Higher Education do not have university status but they offer both academic and vocational programmes of study at the undergraduate and postgraduate levels.

**Quality Assurance and Accreditation**
The competent body for quality assurance and accreditation of the programmes offered by Private Institutions of Higher Education is the Council for Educational Evaluation-Accreditation (Symvoulio Ekpedeftikis Axiologisis Pistopiisis, SEKAP), which is a member of ENQA. At present, a number of programmes offered by the Private Institutions, have been evaluated and accredited by SEKAP. These programmes fall into the following categories:

- Academic and Vocational programmes of study lead to the following qualifications: Certificate (1 year), Diploma (2 years) and Higher Diploma (3 years). For access to these programmes the apolyterion or equivalent qualification is a prerequisite.
- First cycle programmes (4 years), lead to the award of a Bachelor Degree. For access to these programmes the apolyterion or equivalent qualification is a prerequisite.
- Second cycle programmes (1 to 2 years) lead to the award of a Masters Degree. The prerequisite for access to these programmes is the Ptychio, or Bachelor, or equivalent qualification.

**Recognition of Higher Education Qualifications**
The competent national body for the recognition of higher education qualifications is the Cyprus Council for the Recognition of Degrees (Kypriako Symvoulio Anagnorisis Titlon Spoudon, KYSATS). KYSATS recognizes equivalence, or equivalence-correspondence for first cycle titles, or just equivalence for postgraduate titles (second or third cycle). KYSATS may also recognize joint degrees.

**Quality Assurance Agency**
The establishment of a Quality Assurance Agency has been approved by the Council of Ministers of the Republic of Cyprus. The aim of this Agency is to promote quality assurance in both the public and the private institutions of higher education, through various measures which include external accreditation and development of internal quality culture. These efforts are in line with the Berlin Communique, the ENQA Standards and Guidelines on QA, as accepted by the Bergen Communique and the Agreement on Quality Assurance in the EU.


Structure of the Education System of Cyprus
Universities (State and Private Universities)
1st Cycle 4 years 240 ECTS Ptychio or Bachelor
2nd Cycle 1 -2 years 90 – 120 ECTS Magister Artium/ Scientiae or Masters
3rd Cycle 3 – 8 years (minimum residency 3 years) Doctorate
Mediterranean Institute of Management (M.I.M) Postgraduate Diploma
State Institutions of Higher Education (non-university) 1 – 3 years Certificate/Diploma/Higher Diploma
Private Institutions of Higher Education (non-university), programmes accredited by the Cyprus Council of Educational Evaluation-Accreditation (SEKAP)
Vocational/academic programmes Certificate (1 year), Diploma (2 years), Higher Diploma (3 years)
1st Cycle 4 years 240 ECTS Bachelor
2nd Cycle 1 – 2 years 90 – 120 ECTS Masters Degree
Upper Secondary General Education (Lyceum) 3 years - Apolyterion
Upper Secondary Technical and Vocational Education (Technical School) 3 years - Apolyterion
Private Secondary Education 6 – 7 years
Lower Secondary Education (Gymnasium) 3 years
Primary School 6 years
Preschool 1 year
Nursery 1-2 years
State provision
Private provision
Both state and private provision
Optional Education
Mandatory Education
Partially Mandatory Education

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# Quality Assurance and Relevance for Competitive Higher Education: Context of Jordan


**Adnan Badran and Marwan Muwalla**

**Abstract** Quality assurance is becoming a yardstick to measure the delivery of higher education institutions (HEIs) across the Arab world. Assessing the quality of higher education is currently the challenge of every university in the region. Arab universities have expanded in quantity of more traditional institutions due to increase in youth population but not in the same pace of quality. Arab demography of the 20–29-age cohort is 56%, compared with 25% in the OECD. Quality education is crucial to change the landscape of populous demography into rich human resources, particularly in the knowledge economy.

Quality assurance in the European context has evolved in parallel with the Bologna process, and has brought a shift of the use of new pedagogical means of more student-centered and implemented competence-based learning for intended learning outcome. It demonstrates a paradigm shift from a teacher-centered to a student-centered learning environment. The outcome of teaching/learning is well defined and the inputs and processes are aligned accordingly.

With some success, the Arab region has established 14 national commissions for quality assurance (QA) in higher education (HE) and 4 regional networks. Some universities created units of accreditation and QA on their campuses for self-assessment.

Gulf States modernized their HE institutions by adopting the British and American system and establishing partnerships with universities abroad. Social influences, economics, and politics played a major role in reforming HE institutions and many have achieved international QA and accreditation.

At the regional level, the Association of Arab universities (AArU) (http://www.reconow.eu/en/association-of-arab-universities.aspx) established norms and standards for QA and accreditation. The Arab League Educational, Cultural and Scientific Organization (ALECSO) (https://www.alecso.org/en/index.php) created an Arab establishment for QA in programs setting Arab standards for quality and excellence.

A. Badran (✉) · M. Muwalla (✉)
Department of Nutrition, University of Petra, Amman, Jordan
e-mail: abadran@uop.edu.jo; president@uop.edu.jo



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_13

The Arab Network of Quality Assurance in Higher Education (ANQAHE) (http://www.anqahe.org/) was launched in 2007, as independent non-profit, and non-governmental, in association with the International Network, as Quality Assurance Agencies in Higher Education (INQAAHE) (http://www.inqaahe.org/). It provides a platform to enhance collaboration in exchange of information on quality assurance.

UNESCO and the World Bank have launched the Global Initiative for QA Capacity building (GIQAC) (http://unesdoc.unesco.org/images/0015/001591/159197e.pdf) to support QA policy. UNDP focusing on subject assessment funded regional initiatives in 14 Arab countries, 73 programs in computer science, business administration, education, and engineering with peer reviews (https://www.google.com/search?q=UNDP+subject+assessments+in+14+Arab+countries&ie=utf-8&oe=utf-8&client=firefox-b). The British Council (https://www.britishcouncil.org/) and the German Academic Exchange Service (DAAD) (https://www.daad.de/en/) contributed training in self-evaluation for capacity building in QA evaluation.

QA at Arab universities suffers where the majority is oriented toward accreditation as quality control rather than QA of graduates. Private universities, which were supposed to become flexible and quick in catching up with successful models of other parts of the world, have become bureaucratic structures as the public universities, forced on them by the Ministry of HE of an outdated centralized system of governance and curricula, and they were punished if they failed to adhere to these regulations. Teaching is becoming a form of rote learning with no emphasis on promoting independent learners and critical thinkers. Centralized educational systems designed to facilitate quantitative expansion failed in providing performance-oriented systems for quality, competition, and excellence. Ministries have imposed a rigid control policy and hindered both decentralization and greater efficiency. Tangible achievements of QA have not been realized in most universities.

There is an urgent need for pro-active mechanisms for academic development through continuous staff training in skills, pedagogy, and assessment. Benchmarks of QA need to be established at every university to judge institutional performance. Certainly, QA and enhancement of critical analysis of skills have to be institutionalized. The use of media and technology in the learning process would enhance student participation and leadership development.

QAA standard used in the UK have been adopted in Jordan (http://www.qaa.ac.uk/docs/qaa/quality-code/quality-code-overview 2015.pdf?sfvrsn=d309f781_6). Six criteria were used in the methodology of subject assessment by peer-review.

(1) Curriculum design, content, and organization; (2) teaching, learning and assessment; (3) student progression and achievement; (4) student support and guidance; (5) learning resources; and (6) effectiveness of quality management and enhancement.

In Jordan, the HE accreditation commission (HEAC) (Accreditation and Quality Assurance Commission for Higher Education Institutions (HEAC). Jordanian ranking for universities criteria and procedures. Amman. https://eacea.ec.europa.eu/sites/eacea-site/files/countryfiches_jordan_2017.pdf, 2017) set eight indicators for

institutional quality assurance: (1) strategy; (2) governance; (3) academic programs; (4) research, scholarship, and innovation; (5) financial and human resources; (6) students services; (7) community service and international relations; and (8) quality assurance. Also, HEAC has put in place a guide for every academic program in universities to ensure QA of intended learning.

Competition for quality of human capital in the global economy has triggered most countries in the world to take serious steps to develop internal quality management system to enhance QA of the student learning.

The knowledge economy is dependent on how Arab universities can develop and deliver quality and relevant human capital to innovate the marketplace.

**Keywords** Higher education · Quality assurance · Relevance · Competitive education · Student-centered education · Arab universities · Accreditation criteria · Quality indicators · Jordan accreditation indicators · Innovation · Competency

## 1 Introduction

Competitive learning refers to a system of instruction and assessment based on students demonstrating that they have achieved the required skills. Student competency is to achieve the intended learning outcome (s) (ILO).

Its goal is to ensure that students are acquiring knowledge and skills deemed necessary to succeed in career development for life. If failing to meet the expected learning standards, students should receive additional instructions practice and academic support to achieve competency.

Competitive learning aims to produce quality enquiry-based graduates able to think critically to reach new horizons of skills leading to innovation. Competency-based education leads to discovery of new ways and means for constructing knowledge and entrepreneurship. It will lead to enlightenment and lifelong education that recognizes diversity and the cultures of others.

Competitive education will meet challenges in career development and shift challenges to new opportunities in an era of modernity. It leads to empowerment of society to become self-reliant and productive.

In a nutshell, competitive education produces a dynamic brain-intensive society of rich human capital essential for sustainable economic and social progress.

To produce quality and societally relevant graduates in higher education, learning should be student-centered encompassing an educational environment that yields researchers who are able to analyze and solve problems, with skills to become innovators and inventors, and who are able to communicate, and who act ethically and are well-mannered and respect other cultures and workplaces.

UNESCO foresees that global higher education students will reach 265 million in 2025, a growth from the 175 million students in 2010 [11]. This growth coincides with an increasing demand for quality and relevance of higher education.

Quality assurance (QA) is becoming a priority particularly for mobile students and faculty to achieve excellence in meeting international standards. As Leo Tolstoy indicated that "What is important in knowledge is not quantity, but quality. It is important to know what is significant, what is less so, and what is trivial" [12]. Accreditation agencies of HE institutions in various regions in the world, including the six American accreditation boards, take QA as prime goal of their statements.

On QA, some target one central outcome, while others identify certain indicators that reflect some inputs [13]. Quality Matters (QM) is well known for online education and student blended learning [12].

Quality Matters Rubrics is a set of eight standards to evaluate the design of online and blended courses [14].

Quality assurance was born in the private industry [15] and was introduced in England in 1980s as teaching quality assessment (TQA) for institutional peer review later with subjects review in 1995 (replaced in 2001 by the institutional audit of the Quality Assurance Agency (QAA) for higher education in England [16].

Cheng [17] conducted a study of eight criteria for QA, four internal of peer observation, student course evaluation, annual review, and approval system. The other external four of QAA institutional audit, two examining systems and regulating bodies. Results showed academics resistance to quality audit QAA. Involving students in enhancing the quality of education through interviews and panels, is an important task to engage students in the process.

## 2 Building a Culture of Quality

It takes time to build a culture of quality, but once the framework has been set and consensus is reached by staff, students, and stakeholders, a policy is adopted, then the institution is on track to build quality and with time become an inherent part of the culture of the institution. Meeting needs and expectation, values, and consistency toward excellence would make a common framework model to assess learning design, content and pedagogy, where performance is measured in the delivery of products with defined input and intended output. Figure 1 shows a forward simple scheme of the triangle of higher educational process of inputs and outputs for intended learning outcomes (ILOs). The scheme raises a dilemma among

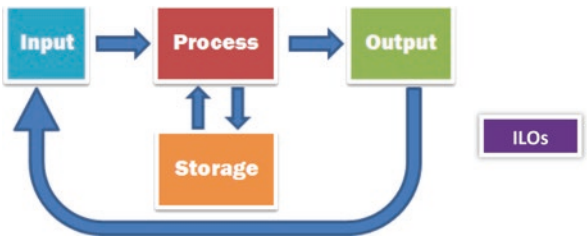


**Fig. 1** The triangle of higher education

professionals of what outcome we are looking for; some reflect certain input as faculty staff-students ratio [13], others emphasize outputs in term of employability. But there is growing demand for accountability and transparency, which lead at the end in building culture of quality [18].

There is no doubt that a common framework of quality cannot be addressed totally in all regions of the world because we have to consider relevance in each region. Yes, internalization, global ranking, and accreditation of universities have closed the gap of QA among universities on mutual standards, but still there are obstacles of justification of governments and agencies who set the standards of HE according to local needs and whether they are fit-for-purpose.

## 3 The Triangle of Higher Education

### *3.1 Input: Characterized by But Not Limited to the Following*

#### 3.1.1 Sound Student-Admission Policy Based on Merit

Although this criterion of student admission has been recognized by higher-education institutions (HEIs) globally, it has not been adhered to by governmental (public) universities in the Arab region, where quotas based on demography and geography, tribal, or political interfere in the policy.

There is a solution to overcome this hindrance to quality of admission of students by providing those who are less privileged a **foundation course** at the entry year to raise the quality of student admission to the standard required of entrance quality.

#### 3.1.2 Faculty and Staff

All faculty and staff should be selected on international standards of quality and appointments must not yield to other narratives of nationality, ethnicity, gender, or any other discriminatory factors.

### *3.2 Output: Characterized by But Not Limited to the Following*

- Higher rate of employability of graduates.
- Flexible graduates who are creative thinkers to shift career.
- Highly skilled in discipline and interdisciplinary to cope with challenges.
- Innovators and entrepreneurs.
- Skilled in utilizing information technology.

### *3.3 The Process: Characterized by But Not Limited to the Following*

- Updated curriculum with online and E-learning.
- Innovative learning environment.
- High quality learning resources.
- Blended interactive learning.
- High quality of faculty and staff utilizing modern international technologies.

## 4 Quality for Competitive Higher Education

Competitive education is student-centered and enquiry-based education. It requires an inducing environment of learning and intended learning outcomes to deliver high quality and relevant graduates for the marketplace.

It needs to graduate critical thinkers with appropriate skills to drive innovation and produce the entrepreneurs who are capable to communicate and construct knowledge. It also needs ethical graduates who can work in different environment and adapt to various cultures.

Quality in HE should adhere to certain standards of the course of study and the level of achieving the goals explicit in the value of education.

It is essential for the HE institution to specify its mission, objectives, ILOs, and be assessed accordingly. Benchmark should be established to improve performance and outputs.

QA should be monitored to ensure sustainable improvements in course content and pedagogy. Accreditation is one instrument that measures QA against certain norms and standards.

There are international accreditation boards that are reputable, in addition to regional and local boards. Parents and students are becoming knowledgeable and have started to look for academic quality and relevant HE that will ensure better employing opportunities for graduates.

The weakness of Arab education is in the quality of curriculum, namely its outdated content and lack of relevance to labor-market needs. There is lack of a lifelong culture of learning, lack of enrichment of extra-curricular activities, and lack of community engagement. Graduates are weak in languages, mathematics, and critical thinking.

In Jordan, an agreement with the Quality Assurance Agency in UK [9] was signed in 2001 for developing criteria for assessing the quality of HE in Jordan, based on the QAA standard used in the UK HE system.

Computer science was the first subject to be reviewed critically in 2001 and 2003 for six aspects each having 4.0 as the highest grade of a total of 24 grade points.

Eight universities were judged by QAA to be satisfactory, and six were judged to be of acceptable international standards. Jordan University of Science and Technology (JUST) and Philadelphia University have obtained the highest grade of 21/24 and awarded the QA National prize. The QAA of UK assessed also, the quality of universities in Jordan in Business administration, Law, Nursing, Accounting, English language and literature, Banking and Finance.

This process of assessment by an international agency on QA has vitalized competition for quality assurance and accreditation of Jordanian Universities by international boards. University of Jordan (UJ), Jordan University of Science and technology (JUST), Princess Sumaya University, University of Petra (UOP), have achieved the Accreditation Board for Engineering and Technology (ABET) [19] in Engineering and ICT. Also, UJ, JUST, UOP achieved the American Accreditation Council for Pharmacy Education (ACPE) [20].

On the local level, UOP has achieved the **institutional** quality assurance of the Higher Education Accreditation Commission (HEAC) [10] of Jordan, and UOP is in the process of achieving the HEAC quality assurance of its **academic** programs.

## 5 Assessing Quality of Higher Education

Quality education lead to perfection, fit for purpose, transformation and values for money. Fit-for-purpose refers to meeting the needs of students and employers. This is explicit on the future of HE for establishing a link between quality teaching and customers.

### *5.1 Value: Added Approach for Assessing ILOs*

In the United States, an assessment was carried out state by state on six categories: preparation, participation, affordability, completion, benefits, and learning. All states received incomplete marks for learning. Yes, there is a lot of teaching but little learning in higher education. Value-added is the only valid approach for capacity building as a consequence of university education [21]. Value-added is the difference between the attainment of students at the start and attainment of the same students once they have completed their education. Measurement should not be one-dimensional, but multi-dimensional. Value-added could be measured against the university's stated vision, mission, objectives, and aspirations. It may include alumni and their employability. Value-added is the best tool to assess student learning.

### 5.2 Intended-Learning Outcomes (ILOs) Assessment

This is to evaluate students as they graduate on skills and capability acquired. The Graduate Record Examinations (GRE), for example, is an important tool. Graduates success in the workplace is another tool of measuring the ILOs.

### 5.3 World Ranking of the Institution of Higher Education

There is an annual global ranking of universities in relation to the quality of higher education. It takes into consideration data on inputs, reputation, and outcomes. Inputs may consider financial resources, faculty resources, and overall students-faculty ratio, resources for quality learning and research, and student admission policy.

Outcome of learning is assessed by measuring graduates' performance by peer-review and external examiners. Reputation is measured by the ratio of students who enroll, to those who are admitted.

Ranking of HEIs attract students who seek quality education for the tuition fees they are paying, attract investment, and a unique place in the league tables among world universities [17].

### 5.4 Self-Assessment

Faculty should assess themselves at the end of each course whether they have achieved the ILOs of their subject or discipline. With time, they discover their weaknesses and strengths, develop their skills and pedagogy, and update their learning resources periodically.

Self-reporting of student learning leads to an evaluation of the course to see if it made a difference in their skills, problem-solving ability, critical thinking, and increased capability. Self-reporting by alumni after 5 years of graduation will give guidance to the institution to shift its course to be more engaged to meet the demand of the marketplace.

### 5.5 Accreditation

This is a recognition or certification of a course or study program meeting a specific criterion or standard. It is considered an important system of QA although accreditation appeared first in the USA in the News of Best Colleges and Universities in order to advise students, parents, and agencies where to go to for quality education.

The American Council of Higher Education Accreditation (CHEA) [22] indicates that accreditation in the U.S. is done by non-profit, non-governmental organizations (NGOs) for academic programs. It examines the academic performance of students in meeting certain standards.

### *5.6 Management of Quality*

The success of a QA system lies in the management process for enhancing integrated components of the learning process. A strategy and plan of action to integrate activities and create cost-effective teaching with comparative advantage for common framework for a QA model involving students should include all stakeholders and not just faculty members as centers of quality management of higher education [17].

Quality as a virtue of professional practice to govern one individual behavior against values and commitments depends on what academics and students want to achieve in university education. This involves building the students' minds for enquiry and aspirations and building their capacities to develop their learning of how to learn. Learning to be, and learning how to live with others in an interdependent world of cultures; these comprise the pillars of education [11].

Fit-for-purpose refers to management by objectives. Institutions define their purpose in their mission and objectives and then management of quality is achieved in the process.

## 6 Relevance for Competitive Higher Education

Relevant education should relate to the needs of the workplace, for innovating new skills new materials and product, and services for the marketplace.

Relevant education should be flexible to accommodate changes in the socio-economic structure of the nation.

An alignment between HE and social needs should include a steering mechanism and measures to support relevance at both the institutional level and program level. A framework should be set up for analysis and diagnosis for structuring systematic reviews of the relevance of HE to be used by policy makers to assess performance of national systems in term of relevance. This leads to structure courses in fields of high demand, a curriculum geared to the marketplace, teaching of practitioners and practical experience, thereby leading to successful outcomes.

Some universities have established a "loop" training course in the industry for on-hands engagement with practice.

The autonomy of universities and academia, which was enjoyed at one time, has yielded to government intervention. Governments have intruded on the autonomy of the university through incentive steering, creating managerial power in the HE

system through ministries and higher councils. Relationships between governments and university managements, particularly in funding, were weakened.

Research should be driven by imperatives of relevance. Grants for R&D should be given to quality research relevant to solving problems.

Career relevance of courses and practical experience are the drivers for employing graduates. Simply, we cannot afford to produce graduates without an opportunity for work. This is wasting funds for no purpose and the value of HE is lost.

Human capital is becoming an important asset for the development of the economy. Therefore, quality in education for providing relevant advanced knowledge and skills in today's workplace is imperative. Stakeholders as partners should be engaged to shape up the outcomes.

Advances in communication technology have contributed to avalanches of information, which require human skills to convert into technology. So education should be flexible in learning for excellence.

Relevance starts with the students' interest. Defining what is relevant is an essential part of learning. It is to blend text to life where the instructor establishes a relationship and considers relevance with the students' interests. This relationship develops the student's motivation to learn for a career and embraces lifelong learning.

The world declaration on higher education published by the United Nations on quality on higher education embraces all functions and activities, namely teaching and academic programs, research, scholarship, staffing, students, faculties, equipment, buildings, services to the community to induce the ideal learning academic environment to students and faculty [23].

## 7 New Trends in Competitive Higher Education

Table 1 shows how the old trends of HE is changing and giving a way to E-learning and on-line learning, using the technology of the media, Internet and other forms to facilitate blended-learning for excellence

**Table 1** Moving trends of higher education

| Old trends | New trends |
|---|---|
| Control the brain | Engage the brain |
| Spoon feeding knowledge | Competent to construct knowledge |
| Closed source material (books) | Open source (electronic, internet) |
| Teaching-centered | Student-centered |
| Knowledge based learning outcomes | Intended learning outcomes (skills) |
| Assessment knowledge driven | Assessment competency and skills |
| Class lectures, at home homework | Class homework, learning at home |
| Teaching and research are mutually disjointed | Teaching and research are mutually complementary |
| Learning is directed to individual students | Teaching and learning is collaborative and team oriented |

New trends in education target brain-intensive learning to construct knowledge through a process of building student-centered and enquiry-based education for intended learning outcomes (ILOs). It aims to deliver competency and skills of researchers, entrepreneurs and innovators, to transfer technology for startup companies. It contributes to advance the socio-economics status of the state.

## 8 The Bologna Process for Internal and External Quality Management (QM)

The Bologna process has led to reforms of the common framework for quality and guidelines in European Countries for Bachelor-Master-PhDs.

There are three main QA components of the Bologna Process for External Quality Management (EQM):

- Common set of Internal and External QA and QA agencies standards and guidelines.
- Adoption of recognition and transparency tools.
- Establishment of "Quality Assurance Registry" to register quality assurance agencies (QAAs) through external reviews and compliance with norms and standards.

Strategic and academic cooperation among HEIs in the Arab region around a common standard of competence-based higher education is a step forward to create a framework for quality.

## 9 Developing Internal Quality Management (IQM)

There are three steps of developing IQM.

- Define the competence level of intended learning outcomes (ILOs).
- Construct an alignment with the outcomes with curriculum, teaching pedagogy, assessment, learning strategy, and learning context.
- Develop a benchmark of measures of quality enhancement and assurance achieved with gap analysis of the ILOs.

## 10 Standards and Guidelines Framework for IQM

The responsibility lies in the higher-education institution (HEIs) for standards and guidelines to achieve the following five aims.

- QA needs to respond to diversity of higher education, programs and students need.
- QA will lead to create a culture of quality culture.
- QA responds to students, stakeholders and society needs.
- QA requires an innovative learning and research environment.
- QA should deliver entrepreneurs and innovators to develop the marketplace.

## *10.1 Pillars of Standards and Guidelines of IQM*

### 10.1.1 Policy for Quality Assurance

**Standards:** Institutions should develop a policy for QA integrated with the strategic management.

**Guidelines:** Policies and processes form the main pillars of the institutional QA system. This will contribute to accountability and develop a culture where internal stakeholders assume responsibility at all levels of the institution. Departments, faculties, staff, and students engage in the QA process. It should protect academic integrity, freedom, offer vigilance against academic fraud. It should guard against intolerance and discrimination of staff or students.

QA policy should cut across the institution, and the process should be monitored and revised.

### 10.1.2 Design and Approval of Programs

**Standards:** Programs should be designed to meet the objectives of intended learning outcomes (ILOs).

**Guidelines:** Study programs are at the heart of the institution mission. They provide students with knowledge and skills to influence career development.

### 10.1.3 Student-Centered Learning and Assessment

**Standards:** Institutions should ensure that the programs are delivered that encourage students to take an active role in creating the learning process, and that the assessment of students reflects this approach.

**Guidelines:** Student-centered learning to stimulate motivation, reflection and engagement in the learning process. Respects and use flexible ways of learning accordingly. Evaluates and adjusts the modes of delivery and pedagogical methods. Autonomy in the learner, with adequate guidance from the teacher. Promotes mutual respect within the learner-teacher relationship. The assessment allows students to demonstrate the extent to which the intended learning outcomes have been achieved. Students are given feedback.

### 10.1.4 Student Admission, Progression, Recognition, and Certification

**Standards:** Institutions should publish regulations covering all phases of the student "life cycle" e.g. student admission, progression, recognition and certification.

**Guidelines:** Providing support for students to make progress in their academic career through programs, institutions and systems. It is vital to have fit-for purpose admission, recognition and completion procedures.

Graduation represents academic achievement of the students' period of study. Students need to receive documentation explaining the qualification gained, including achieved learning outcomes and the context, level, content, and status of the studies that were pursued and successfully completed.

### 10.1.5 Teaching Staff

**Standards:** Institutions should ensure the competence of their teachers through fair and transparent processes for the recruitment and development staff.

**Guidelines:** The teacher's role is essential in enabling the acquisition of knowledge, competences and skills. Stronger focus on learning outcomes require student-centered learning and teachers who update themselves with skills and pedagogy with inducing environment to work effectively and ensure the professional development of teaching staff and strengthen the link between education and research and promote innovation in teaching and use of new learning technologies.

### 10.1.6 Learning Resources and Student Support

**Standards:** Institutions should provide funding for learning and teaching activities and ensure adequate support of learning resources.

**Guidelines:** Institutions provide resources to assist student learning, physical resources such as libraries, study facilities and IT infrastructure and human support as tutors, counsellors. Also, the support of administrative staff is crucial and they need to be qualified and have opportunities to develop their competences.

### 10.1.7 Information Management

**Standard:** Institutions should ensure data processing for effective management of their programs.

**Guidelines:** Reliable data is crucial for decision-making and establishing performance indicators and profile of the student population progression, success and drop-out rates and students' satisfaction with their programs and career paths of graduates.

### 10.1.8 Public Information

**Standards:** Institutions should publish information about their activities, including programs.

**Guidelines:** To provide the intended learning outcomes of these programs, the qualifications awards, the teaching, learning and assessment used the pass rates and the learning opportunities available to graduates for employment.

### 10.1.9 On-Going Monitoring and Periodic Review of Program

**Standards:** Institutions should monitor and periodically review their programs to ensure that they achieve the objectives set for them and respond to the needs of students and society.

**Guidelines:** Regular monitoring, review and revision of study programs to create a supportive and effective learning environment for students. Ensuring that the program is up to date and is changing according to the needs of society to ensure students' workload, progression and completion and effectiveness of assessment of students to ensure learning environment and support services and their fitness for purpose. Programs are reviewed and revised regularly involving students and other stakeholders. The information collected is analyzed and the program is adapted to ensure that it is up-to-date.

### 10.1.10 Cyclical External Quality Assurance

**Standards:** Institutions should undergo external quality assurance.

**Guidelines:** This will act as a catalyst for improvement and offer the institution new perspectives. Quality assurance is a continuous process that does not end with the external feedback. Therefore, institutions should ensure that the progress made since the last external quality assurance is taken into consideration when preparing for the next round.

## 11 External Quality Assurance (EQA)

**Standards:** External quality assurance will analyze the accountability of internal quality assurance processes.

**Guidelines:** Quality assurance in higher education is based on the institutions' quality of programs and, external quality assurance includes standard of internal QAS.

## *11.1 Designing Fit-For-Purpose*

**Standards:** External quality assurance should be designed to ensure its fitness to achieve aims and objectives.

**Guidelines:** to support institutions to improve quality, to demonstrate this improvement and outcomes and the follow-up.

## *11.2 Implementing Processes*

**Standards:** A self-assessment, an external assessment including a site visit; a report of the external assessment, and follow-up.

**Guidelines:** Consistent follow-up process for considering the action taken by the institution.

## *11.3 Peer-Review Experts*

**Standards:** External experts that include (a) student member(s).

**Guidelines:** Appropriate skills of experts who are competent to perform their task.

## *11.4 Criteria for Outcomes*

**Standards:** Any outcomes should be explicit and published.

**Guidelines:** Outcomes are based on pre-defined and published criteria.

## *11.5 Reporting*

**Standards:** Reports by the experts should be published, clear and accessible to the academic community.

**Guidelines:** Evidence, analysis and findings and results, good practice, demonstrated by the institution and recommendations for action.

### *11.6 Complaints and Appeals*

**Standards:** Complaints and appeals be clearly defined.

**Guidelines:** Ensure fair decision-making, external quality assurance in an open and accountable way.

## 12 External Quality Assurance Reviews

### *12.1 Standards for Quality Assurance Agencies (QAAs)*

- QAAs should be subject to external reviews to ensure the involvement of stakeholders. Should have explicit objectives and mission statement.
- Should be established on legal basis and recognized by competent public authority.
- Independence and autonomous without third party influence.
- Should be subject to thematic analysis.
- Adequate resources.
- Internal quality assurance and integrity of their activities.
- Subject to cyclic external reviews.

### *12.2 ABET Criteria for Quality Assurance*

In the Accreditation Board for Engineering and Technology (ABET 2017) accreditation is not a ranking system, but a form of QA for programs in applied science, computing, engineering, and technology. Accreditation of QA is offered to program only. It is based on the following eight criteria.

- Students
- Program educational objectives
- Program (student) outcomes and assessment
- Continuous improvements
- Curriculum
- Faculty
- Facilities
- Institutional support and financial resources

### *12.3 UK Quality Assurance Agency (QAA): Evaluation of Quality in Education*

QAA-based evaluations use the following criteria (QAA 2014):

- Aims and intended learning outcomes (ILOs)
- Curriculum design content and organization
- Teaching, learning and assessment
- Student progression and achievement
- Student support and guidance
- Learning resources
- Quality management and enhancement

## 13 Quality Assurance in the Arab Region

There is awareness in the Arab region of the importance of QA in higher education; some positive steps were undertaken as in the following.

- The Arab region has created 14 national commissions for QA. Some universities created accreditation and QA for self-assessment units on campus
- Gulf universities created partnerships with universities abroad for recognition and QA
- The Association of Arab universities (AArU) established standards for accreditation and QA
- Arab network on QA was launched in 2007 as an independent, not-for-profit NGO and provides a platform on QA
- UNESCO and World Bank launched global initiative for QA policy capacity building.
- UNDP funded regional initiatives in 14 Arab countries with 73 programs in QA evaluation.

However, there are challenges to be undertaken by HEIs in the Arab region as in the following issues.

- Outdated curriculum and contents
- Lack of life-long learning culture
- Lack of extra curricula activities and training
- Lack of proficiency in language and skills.
- Outdated pedagogy and weak use of computer aided instructions and use of the multi-media instruction in the learning process.

- Programs are oriented toward accreditation and quality control rather than quality assurance.
- Centralized governance and rigid regulations under the domain of ministries of higher education.
- Lack of Benchmark to judge program and institutional performance.

## 14 Jordanian Evaluation of the Quality of Higher Education: Accreditation and Quality Assurance Commission for HEIs, 2017 (HEAC)

Jordan Quality Assurance Standards comprised the following eight criteria.

- Strategic planning.
- Governance.
- Academic program.
- Research and innovation and scholarship.
- Financial and human resources.
- Students.
- Community and International collaborations.
- Quality management and enhancement.

An agreement was signed with the UK Quality Assurance Agency (QAA) for assessing HE in Jordan. Six QAA criteria were used in the methodology of assessment to achieve aims and intended learning outcomes (ILOs) of the performance of academic programs at universities in Jordan. Eight universities were judged as satisfactory, six universities were judged as acceptable of international standards.

ABET was achieved later by University of Jordan (UJ), Jordan University of Science and Technology (JUST), Sumaya University, and University of Petra in Engineering and IT programs.

The University of Petra (UOP) achieved the institutional QA of HEAC as the first university to apply for its QA.

HEAC also produced standards and guidelines for QA in every academic program offered by Jordanian Universities. Many academic programs are in process for assessment and evaluation for HEAC standards indicated earlier.

## 15 Summary

Advancement of the knowledge economy in the Arab world is so dependent on reforms of higher education in order to develop and deliver competitive quality and relevant human capital to innovate the marketplace. Quality assurance is required to

safeguard the integrity of learning to achieve competency, and to provide indicators and benchmarks that lead to the delivery of excellence in both teaching and research. The Arab region has witnessed a large expansion in the number of HE institutions, but there has been less emphasis on quality. Arab universities should target teaching less and learning more through blended learning to stimulate critical thinking, enquiry and problem-solving, reading, and life-long learning.

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# On the Quality Assurance of Faculty Members


**Mohamed Bettaz and Marwan Kamal**

**Abstract** University faculty members need to be continuously provided with necessary knowledge and skills allowing them to address the challenges they face in their daily work. Indeed, they need not only to enhance their teaching and research capacity, but also to build other capabilities among which the capacity for planning and performing various quality-assurance activities.

In this contribution, we propose and discuss some measures and actions aiming at involving faculty members into certain quality-assurance processes and related activities. This allows them to acquire the quality-assurance culture and competencies they need by doing instead of resorting to one-off passive induction training sessions, as this is usually the case in some higher-education institutions. Our proposal will be supported by some best-practice examples, learned from our participation in national and international quality-assurance projects and programs.

**Keywords** Institutional quality assurance · Programme quality assurance · Mixed quality assurance · Quality assurance of faculty members · Extending faculty members' teaching capacity

## 1 Introduction

Quality assurance in higher education is still a matter of debate in many countries. In our Region, many educational institutions are subject to pressures from governments and other bodies to elaborate quality-assurance policies, and implement related processes and procedures, according to given guidelines. Most of the time, the guidelines are strongly based on (or "borrowed" from) standards elaborated by international agencies. In this context, it is not surprising that many of our faculty members reject (or try to "comply" only with some of the external facets of) the

M. Bettaz (✉) · M. Kamal
Philadelphia University, Amman, Jordan
e-mail: mbettaz@philadelphia.edu.jo; mkamal@philadelphia.edu.jo



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_14

proposed quality-assurance frameworks. Like their colleagues from other countries, many of our educators still believe that most of the quality-assurance issues are incompatible with traditional issues of academic life and autonomy.

It is worth mentioning that the concept of quality assurance and related processes refer to a general framework based on the so-called "fit for purpose" principle, giving rise to as many implementations as potential missions defined by higher-education institutions. Specific implementations indeed require the aims and objectives inherent to institution mission to be very well understood by all the stakeholders, including faculty members and students. According to our point of view, the (general) framework mentioned above builds around an approach known from some engineering disciplines, starting from specifications (of the desired "product"), and ending by its realization. In the case of the software engineering discipline, the specifications concern a software product, and the software product is obtained through a refinement process that might consist of several phases. In the case of quality assurance in higher education, we start by the institution mission that is refined into aims and objectives; quality is then demonstrated if the objectives are achieved. This approach applies to institutional-oriented quality assurance and the programme-oriented quality assurance as well. It is worth noting at this point that learning resources appear to be one of the most relevant aspects to both approaches to quality assurance: indeed, according to ENQA [1], "teachers are the single most important learning resource available to most students". Faculty members are so important not only because of the knowledge of the subject they are teaching, or because of their capability to transmit effectively their knowledge to the students, but also because of their intimate relationship with all the other aspects relevant to the quality assurance of programmes. In fact, faculty members are not only accomplishing a teaching and assessment activity, but they are also involved in designing curricula, their content and organization. On the other hand, faculty members are not mere users of "physical" learning resources, but they are also implicated in the identification of such resources and in designing effective solutions around them. From this observation, it is not too exaggerated to conclude that the quality assurance of programmes is strongly based on the quality assurance of the faculty members. It is therefore important for higher-education institutions to ensure not only that they are applying appropriate appointment procedures, but also to give recruited faculty members opportunities to continuously develop their pedagogical, research, and other relevant capacities, and encourage them to value their competencies.

In this contribution, we propose and discuss a series of measures and actions aiming at involving from the very beginning freshly recruited faculty members into the various quality-assurance processes and activities starting from the curriculum design, organization and content, and ending by the programmes' quality-assurance management and enhancement. This allows them to acquire the essential quality-assurance culture and competencies by doing instead of resorting to one-off passive induction training sessions, as this is usually the case in some higher education institutions. Our proposal will be supported by some best-practice examples, learned from our participation into national and international quality-assurance projects and programs.

The rest of the paper is structured as follows. In Sect. 2, we recall some basic notions on quality assurance in higher education. Section 3 is devoted to approaches and strategies related to quality-assurance frameworks and to their implementation in various educational systems. Section 4 deals with the quality assurance of academic programmes, and points out the intimate relationship between the quality assurance of faculty members and the quality assurance of academic programmes. In Sect. 5, we propose some measures aimed at developing and extending the teaching capacity of faculty members. In Sect. 6, we show how faculty members might be "smoothly" involved into the achievement of some quality-assurance processes. Section 7 draws conclusions and outlines future work.

## 2 On Quality Assurance in Higher Education

The concept of quality assurance in higher education is related to a very general framework, and not to a specific or concrete implementation. The framework comes with a "universal" methodology, allowing the creation of as many implementations as possible. This means that no implementation could be merely "borrowed" from a third party, not only because specific implementations are highly context-dependent, but also because of the need for a deep understanding of the broad aims by all of the stakeholders (cf. for instance, Bologna Process, the European Higher Education Area, and Avicenna Virtual Campus). It is, however, worth mentioning that the framework mentioned above is independent from any "definition" of the concept of quality in higher education, even if the one that seems to be widely accepted in a large number of institutions around the world is the one defining quality as "fitness of purpose". This means that it is up to higher education institutions to define their mission, aims, and objectives according to standards defined by quality-assurance bodies; quality is then demonstrated by achieving the objectives set. This approach is not unknown to the software engineering community accustomed to dealing with specifications and satisfying those specifications. Table 1 [2] makes a brief comparison between the concepts of audit, assessment, and accreditation and shows how quality is demonstrated using each one of them.

**Table 1** Demonstrating quality

| Activity | Process | Output |
|---|---|---|
| Audit | Investigate achievement of objectives | Description |
| Assessment | Investigate achievement of objectives, and how good one is | Grade |
| Accreditation | Checks how good enough one is | Yes/no |

## 3 Approaches, Strategies, and Implementation

Approaches, strategies, and implementation of quality-assurance systems depend more or less on national or even regional higher-education systems (cf. the systems set in USA, UK, the European Higher Education Area, Africa, Asia, South America, the Arab Region, or the Mediterranean region).

Some higher-education systems follow two approaches to quality assurance: a programme-oriented approach and an institutional-oriented approach [3, 4]; however, some institutions are following a mixed approach mixing deploying both approaches mentioned above. Such an approach is called a mixed approach. Quoting Spyros et al. [3], "the programme-oriented approach is often considered as the most appropriate when a quality assurance system has just been implemented because it allows the content of programmes, which are the core business of higher education institutions, to be thoroughly examined". "The objectives of the mixed approach, in most of the systems are, among others, to enhance public confidence in the quality of education". According to our point of view and reflecting our modest experience in the domain, it is not easy to establish a clear separation between both approaches. When Philadelphia University in Jordan experienced for the first time a quality-assurance external review under the auspices of the Al Hussein Fund for Excellency, the review was conducted by subject and quality-assurance specialists form the Quality Assurance Agency (QAA, UK). Even if the review was classified as a subject review, many aspects of the review were directly or indirectly linked to aspects relevant to the institution's management. Presently, Philadelphia University is preparing for an external review conducted by the Jordanian Accreditation and Quality Assurance Commission for Higher Education Institutions. The review is conducted according to the following eight standards and related sub-standards [5].

1. Strategic planning
2. Governance
3. Academic programmes
4. Scientific research, institutional exchange, and innovation
5. Financial, material and human resources
6. Student services
7. Community services and external relations
8. Quality assurance management

The informed reader will note that the approach followed by the Jordanian Commission is a mixed one; nevertheless, the programme-oriented approach adopted by the British QAA and experienced by Philadelphia University helped so much when preparing for the mixed approach adopted by the above-mentioned Jordanian Commission.

The remaining part of this section is devoted to a brief comparison of two projects of educational systems promoting a regional dimension in quality assurance by developing comparable criteria and methodologies: The European Higher Education area (EHEA) and the Avicenna Virtual Campus (AVC). Both projects aim to:

- Promote the necessary regional dimensions (Europe, Mediterranean Basin) in higher education (curricular development, inter-institutional co-operation, etc.)
- Establish a system of credits (ECTS for EHEA, ACTS for AVC) as a proper means of promoting the most widespread (learner) mobility.
- Promote lifelong learning.
- Promote the attractiveness of the Higher Education Area (Europe, Mediterranean Basin).

It is worth mentioning that both of these two areas are concerned with multilingual, and to a certain degree, multicultural communities. Philadelphia University has had the immense privilege to represent the Jordan Kingdom in the AVC project and got the opportunity to share much of the best practices in terms of quality assurance as regards to "traditional" education and e-education as well. The other partners of this project were [6] the UNED (Spain), the NIACE (UK), the CNAM (France), the Nettuno (Italy), the METU (Turkey), the University of Damascus (Syria), the AQ- OU (Palestine), the Cairo University (Egypt), the UC (Cyprus), the LU (Lebanon), the MCST (Malta), the UVT (Tunisia), the UFC (Algeria), the ENSIAS (Morocco).

## 4 The Quality Assurance of Programmes

Whatever the quality assurance frameworks and standards are, the quality of a provision is generally assessed with respect to the following "key areas", suggested in the late 1990s in QAA documents related to subject review [7].

- Curriculum Design, Content and Organization
- Teaching, Learning and Assessment
- Student Progression and Achievement
- Student Support and Guidance
- Learning Resources
- Quality Management and Enhancement

Institutions interested in an external assessment should prepare a self-evaluation report (SER). Before asking for an external (independent) review, the institution performs the checking against the evidence; the role of the external review is then to "check the checking". This approach is well known to computer scientists. Usually when you propose a new algorithm, you have to provide a proof, and it up to the reader (the reviewer) to check the correctness of the proof by her/his own means.

It is, however, worth noting that the success of the whole process is highly dependent on the quality assurance of the faculty members, since the majority of the tasks relevant to the above-mentioned areas of a provision are performed by faculty members in close collaboration with the concerned stakeholders.

By learning resources, one usually understands ICT resources, library facilities, research laboratories, and other similar "physical" resources. However, as already

mentioned in the introductory section of this contribution, it appears that faculty members are the most important learning resource. In fact, the quality assurance of the six key areas of a provision, that is the quality assurance of the academic programmes in all of their aspects, is highly dependent on the quality assurance of the faculty members. That is why higher-education institutions must accompany faculty members not only in their quest to develop their teaching and research capacity, but they must also give them the opportunity to be trained in certain areas such as the above-mentioned "key areas" of a provision, and in related quality-assurance procedures and processes.

## 5 Developing and Extending Teaching Capacity of Faculty Members

In this section, we investigate some of the ways and means allowing for the improvement and extension of the teaching capacity of faculty members. Our proposal is mainly based on best practices learned when setting up the quality-assurance system at Philadelphia University, and also on the experience shared with the Avicenna Virtual Campus project partners. It is worth mentioning that Philadelphia University has a well-established policy and relevant procedures for the recruitment and appointment of faculty members. Appointed faculty members have many opportunities to develop and enhance their teaching and research capacity. However, appointed faculty members who do not seize these opportunities, and fail to fill their duties, are removed in accordance with a clear policy and relevant appraisal procedure known to all parties.

### *5.1 Pedagogical Seminars and Presentations*

The role of pedagogical seminars (vs. research seminars) in developing the teaching capacity of faculty members consists in conducting discussions around course syllabuses. Presenting course syllabuses in detail allows faculty members to better perceive what is being delivered to students, and might eventually lead to desired improvements such as eliminating redundant parts, or "adjusting" some syllabuses so that curricula are fully covered by the designed syllabuses. Indeed, such seminars might point some unintentional omissions.

On the other hand, pedagogical seminars allow faculty members to present in more detail the material delivered in their course unit (module), and what they are expecting from their students to know from other pre-requisite course units. The feedback from peers playing the role of students often leads to very fruitful discussions and potential reviews of the material delivered in various course units, thus contributing to a better perception by the students of what is expected from them.

## 5.2 *Building on Best Practices from e-Learning*

The use of Information and Communications Technologies (ICT) facilities in relation to e-education has led to a variety of "intermingled" concepts whose boundaries are often difficult to define precisely. In fact, we are often confronted with a variety of ambiguous terminology, such as d-learning, i-learning, e-learning, etc., which one is often not sure of having understood the precise meaning. In this section, we refer to the experience shared with the partners having contributed to the AVC project [6], where the partners agreed on the following definition of the term e-learning.

- Setting of an educational charter that is "aware" of the "new" educational approaches that became implementable thanks to the advent of ICT. It is up to this educational charter to precise what is meant by the term e-learning (learner-centered strategies, experiential learning, action learning, free choice learning, cooperative learning, service learning, and other similar ways of learning).
- Identifying (or creating) an authoring language (or tool), for editing the material that has to be published online.
- Identifying (or building) an e-learning platform that is accessible online to the learners.

Our purpose here is not so much to recall the history of the Avicenna network as to show how Philadelphia University has benefited from an experience that it has been able to capitalize on, in order to develop and extend the teaching capacity of faculty members. Indeed, in addition to defining a flexible pedagogical model (independent from authoring tools, and e-learning platforms), the AVC project offers also a quality-assurance framework [6]. At this point we will not consider this framework in its entirety, but limit ourselves to the quality of content development (i.e. course elaboration).

It is important to stress that the content of an Avicenna course unit (module) is not developed by a single faculty member but by an "integrated" pedagogical team according to the following (content development) cycle:

- Creation of the content,
- Review of the content, and
- Editing of the content that will be delivered to the students.

This process permits not only to develop a higher quality content, but it also allows new faculty members to benefit from the contributions of more experienced colleagues in the field.

It goes without saying that the course unit might be delivered by any member of the team who has contributed to the development of the content, or by several members of this team if the content has to be delivered to several sections simultaneously, thus guaranteeing more equity to the students receiving the course. The following table summarizes our suggestion aiming at extending faculty members' teaching capacity (Table 2).

**Table 2** Borrowing from e-learning and blended learning

| e-learning | Face-to-face education | Suggestions |
|---|---|---|
| e-learning material development by a team | Course material is (usually) developed by individuals | To develop course material by a team |
| e-learning material is reviewed before, through and after delivery | Course material is reviewed after delivery | To let course material be reviewed more often and also before delivery |
| e-learning material might be delivered by the e –learning material developer and/or a tutor | Course material is (usually) delivered by (course producer) i.e., senior faculty member | To let course material be delivered by a new teaching staff member |

## *5.3 From e-Learning to Blended Learning*

A "consistent" way for the implementation of the approach suggested in the previous section is to go through blended learning. By blended learning we might understand a way of learning that "combines" e-learning with "traditional" classrooms. This requires the availability of online digital material and the use of face-to-face physical classrooms as well. There is, however, a lack of consensus on the way the combination of physical face-to-face teaching with online learning is implemented. This leads to various possibilities of implementation that are most of the time highly context-dependent.

The approach implemented by Philadelphia University can be summarized as follows. The whole content of a course unit (which is fully developed according to the Avicenna Pedagogical Model) is accessible to the students through an interactive e-learning platform. Two lectures are delivered per week in a dedicated classroom and within a fixed time slot: One of these two lectures is taught face-to-face, while the other is followed online. The online material might be accessed from the inside of the campus or from the outside. Students who are accessing the online material during the fixed time slot and from the dedicated classroom might benefit from synchronous interaction with the faculty member delivering the course unit. Students who decide to access the online material from the outside of the campus can benefit only from asynchronous interaction with the faculty member. Moreover, they have 24 h to interact with the online material; otherwise they are reported by the e-learning platform tracking system as absent.

The policy behind this way of implementing such a form of blended learning is firstly to offer some flexibility for students who, for objective reasons, cannot attend the lecture from the inside of the campus during the fixed period, and secondly to allow the development of higher-quality learning material. Indeed, it is very likely that a content developed by an integrated pedagogical team, according to a "well thought" development cycle (content creation, content review, and content editing) is of a better quality than a content prepared by a single faculty member and delivered directly to the students.

# 6 Involving Faculty Members in Quality-Assurance Processes Related to the Achievement of Learning Outcomes

It is not unusual for some faculty members that their exam questions reflect more the delivered content (of a taught course unit), rather than what is required by the objectives (set for the course unit). In addition, the examination process usually terminates by the correction of the exam sheets and by allocating marks to the exam questions.

In this section, we show how the "matrices' game" might be refined in such a way that it might help the faculty member in preparing his exam paper, by relating exam questions to the learning outcomes of course units, but also to reassure him/her (and the concerned stakeholders as well) that the required skills have actually been effectively acquired.

## *6.1 The Matrices' Game*

The use of matrices in this context allows, through successive refinement steps, to show how the objectives of an academic programme (defined at the most abstract level) are reflected in the daily performance of the teaching, learning, and assessment activities. This allows faculty members to be fully aware of the importance of the consistency of an academic programme in its entirety, and that what is being taught in the classroom reflects accurately the objectives set for the program. In this section, we show how matrices might be used in relation to the achievement of learning outcomes. These matrices are used with the objective to support the quality assurance of teaching, learning, and assessment, and by the way allowing newly appointed faculty members to develop and extend their teaching capacity by benefiting from the support of experienced faculty members.

When preparing or updating (at the beginning of each semester) syllabuses for course units, faculty members in the Faculty of Information Technology in Philadelphia University have to be precise in the learning outcomes that have to be achieved by development, and what the learning outcomes are that have to be achieved by assessment. Suppose that the learning outcomes are defined according to the following categories:

A: Knowledge and understanding with A = {A1, ...Ak}
B: Intellectual skills with B = {B1, ...Bl}
C: Practical skills with C = {C1, ...Cm}
D: Transferable skills with D = {D1, ...Dn}

Suppose that:

Ai, Aj, ($1 \leq i \leq k$, $1 \leq j \leq k$ with $i = j$), and Bi, Bj, ($1 \leq i \leq l$, $1 \leq j \leq l$ with $i = j$) are developed through lectures and assignments.

Bk ($1 \leq k \leq l$) and Ci, Cj, ($1 \leq i \leq m$, $1 \leq j \leq m$ with $i = j$) are developed through assignments and lab work.

Di, Dj, ($1 \leq i \leq n$, $1 \leq j \leq n$ with $i = j$) are developed through tutorials and assignments.

### 6.1.1 The Development

Table 3 shows how to check that what is required by the syllabus is implemented in the classroom and in the laboratories. This table might be established by the faculty member delivering the course unit and checked by the course unit coordinator or by the head of the department. However, there is no a formal way how to check that everything was effectively implemented. The establishment of the matrix represented in Table 3 and the control of the veracity of its content depends highly on the quality assurance of the faculty member.

### 6.1.2 The Assessment

In this section, we show in contrast to what was said with respect to the learning outcomes achievement by development, that the process of learning-outcomes achievement by assessment might be formally checked. To prepare an exam, the faculty member needs to refer to the item "learning outcomes achievement by assessment" in the course unit syllabus. At Philadelphia University, questions in an exam paper are organized into three categories: questions covering basic notions, questions related to familiar problem solving, and questions related to unfamiliar problem solving. Questions covering basic notions are supposed to be answered (more or less) by all the students taking the exam. Questions related to familiar problem solving are supposed to be answered by the majority of the students taking the exam, while a few students only are supposed to answer questions related to unfamiliar problem solving. Table 4 shows how exam questions are prepared in such a way that not only all the required learning outcomes are "covered", but that they are also covered according to the above-mentioned three categories (i.e. basic notions, familiar problem solving, and unfamiliar problem solving). Even if such a

**Table 3** Learning outcomes achievement by development

| Development | Ai | Aj | Bi | Bj | Bk | Ci | Cj | Di | Dj |
|---|---|---|---|---|---|---|---|---|---|
| Lectures | √ | √ | √ | √ | | | | | |
| Assignments | | | | | √ | √ | √ | √ | √ |
| Lab work | | | | | √ | √ | √ | | |
| Tutorials | | | | | | | | √ | √ |

**Table 4** Learning outcomes achievement by assessment

| Exam questions | Ai | Aj | Bi | Bj |
|---|---|---|---|---|
| Question no 1 | √ | √ | | |
| Question no 2 | √ | √ | | |
| Question no 3 | | √ | √ | |
| Question no n | | | √ | √ |

table is established by the faculty member preparing the exam, the effective implementation might be formally checked by the internal examiner and also by the head of the department. This is the case at the Faculty of Information Technology at Philadelphia University. Indeed the internal examiner might check if:

- The exam questions are clear.
- The exam questions are accessible to the "majority" of the students.
- The exam questions address the learning outcomes.

After correction of the examination sheets, the faculty member concerned might also assess the relevance of the examination paper by answering the following questions:

- Is there a correlation between students' answers and the classification of the exam questions into the three categories: Basic notions, familiar problem solving, and unfamiliar problem solving?
- Are the students' marks normally distributed?

The answers to such questions might be easily checked by an internal examiner or by the head of the department. At the Faculty of Information Technology in Philadelphia University, the answers are checked by the head of the department and examined by the quality-assurance committee. An external examiner might thus "check the checking".

## 7 Conclusions

Quality-assurance systems are nowadays considered as basic blocks of higher-education institutions. To build their systems, some of these institutions are assisted by quality-assurance professionals. There are, however, other institutions that tend to involve from the very beginning their faculty members in the implementation and running of their quality-assurance systems. It is, therefore, important not only to equip (mainly newly appointed) faculty members with adequate knowledge to be good teachers and researchers, but also to provide them with necessary skills allowing them to participate in various activities relevant to quality-assurance issues. In this paper, we firstly proposed and discussed some measures aiming at developing and extending the teaching capacity of faculty members. Some of these measures are based on best practices learned from our participation into the Avicenna Virtual

Campus project. Secondly, we have presented an approach showing how to involve faculty members in quality-assurance processes related to the achievement of learning outcomes. It is clear that these processes fall in the "key area" named "Teaching, Learning and Assessment" (cf. Sect. 4).

In future work, we propose to tackle the "Quality Management and Enhancement" key area. The objective is to show how newly appointed faculty members might be "smoothly" involved into the achievement of some quality-assurance processes related to this area.

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# Role and Impact of Bibliometric Analysis of Research Productivity in Faculty Evaluation, Recruitment, Promotion, Reappointment, Benchmarking, and in Mission-Based Management (MBM): Experience of the Faculty of Medicine at the American University of Beirut (AUB), 1997–2007


**Nadim Cortas and Boushra Rahal**

**Abstract** The use of bibliometrics in research evaluation is rapidly gaining popularity and importance. It is becoming an essential tool to assess and stimulate research productivity, guide decisions in research funding and benchmark with peer institutions.

This chapter focuses on bibliometric analysis of research performance in the Faculty of Medicine (FM) at the American University of Beirut (AUB). Data are obtained from the Curriculum Vitae and the databases of Scopus and ISI Web of Science. Performance of the FM is compared to similar data obtained from 1997 to 2007 for 123 medical schools registered at the American Association of Medical Colleges (AAMC). The indicators applied include: number of papers, total number of citations, average citations per paper, percentile journal ranking per discipline, impact factor (IF), Adjusted IF (Adjusted IF is the Journal Impact Factor (IF) adjusted for the type of publication and author position of each investigator), impact index, and funding. Collaboration patterns within and among the departments at the FM are presented.

The targets established for FM can be partially attributed to increasing, as per Scopus, the number of articles by 4.7-fold, the number of articles per faculty per year by 4.0-fold, and extramural funding by 3.7-fold, in 10 years. This improved the

N. Cortas (✉)
Faculty of Medicine, American University of Beirut, Beirut, Lebanon
e-mail: cortasn@aub.edu.lb

B. Rahal
Office of the Provost, American University of Beirut, Beirut, Lebanon



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_15

quality of research productivity at promotion without decreasing promotion success rate, and increased the number of faculty members eligible for tenure or long-term contract. The average amount of funding required at FM per investigator to achieve the set target is determined.

Applying a basket of bibliometric indicators provides an overview of the research productivity of the investigator, department and medical school. Bibliometrics complement rather than replace peer assessment, they guide decision-making and facilitate benchmarking.

**Keywords** American University of Beirut (AUB) · Bibliometrics · Benchmarking · Faculty of Medicine · Faculty evaluation · Research Funding · Promotion · Research productivity · Research evaluation · Collaboration

## 1 Background

The Faculty of Medicine at the American University of Beirut (AUB FM) was established in 1867 and built its hospital complex in 1908–1910. Schools of Nursing, Pharmacy, and Dentistry were added from 1871 to 1910. The School of Public Health was established in 1954. The complex was developed similar to that of peer institution in the USA. Residency programs started in 1945 and specialty fellowship programs began as of 1971. The hospital was the first in the region to receive full accreditation by the US Joint Commission on Accreditation of Healthcare Organizations, JCAHO (1956–1986).[1] It became a referral center for patients from the entire region and beyond. A new Medical Center (AUBMC) with a 425-bed hospital was inaugurated in 1970. In addition to the medical program leading to an MD degree and a graduate program in basic sciences leading to an MS degree, a PhD program in basic medical sciences was established in 1966. A laboratory research and teaching building, the Diana Tamari Sabbagh Building, was occupied by the FM in 1975.

The Lebanese civil war from 1975 to 1991 interrupted and changed the course of progress at the Medical Institutions (MI) of AUB. The patient pool diminished significantly to become primarily that of west Beirut. The patient mix became skewed to that of a war zone. The Medical Center, however, adapted quickly to war and took care of almost all the serious victims in most of Lebanon. Faculty attrition occurred gradually and peaked in 1984–1991 while the student catchment area became restricted almost to Lebanon. Faculty and administration succeeded in maintaining excellence in medical education and postgraduate training at the cost of consolidation. The PhD program was suspended in 1987 after the last student graduated. Tenure appointment was suspended in 1985. The number of full-time basic science faculty members went down to 10. They continued to give all medical courses in

[1] Renamed Joint commission (JC) in 2007 and established the Joint Commission International (JCI) for international institutions.

basic sciences with contributions from clinical and visiting faculty, but eliminated to a great extent laboratory and discussion sessions. Teaching became didactic and modular. Graduates continued to excel in the US or elsewhere similar to their predecessors. Patient care was affected most. The rapid change in the catchment pool, patient load, and mix, made some services downsize while others, such as orthopedic surgery, grow rapidly. The number of occupied beds gradually decreased from around 400 to approximately 170, with hospital floors having to be closed. This resulted in maldistribution of hospital employees, whose total number also became relatively large, a number of employees however, could not show to work regularly because of hostilities. Significant variations, discrepancies, and inequity in remunerations of faculty members/physicians and employees of equivalent status, resulted from the stepwise and profound devaluation of the Lebanese pound (1984–1993) inspite of variable attempts for re-adjustments. During this period, the hospital was reimbursed through Government (National Social Security Fund, NSSF and Ministry of Health, MOH) funds, direct contributions or indirect through warring factions, non-government organizations (NGOs), and self-pay. After the fighting stopped in 1991, contributions gradually decreased and within few years, NSSF and MOH funds started to deplete. As of the late 1990s, the rate of increase in expenses became higher than the rate of growth in revenues, with significant uncollectable government receivables. The recovery from this unsustainable structural deficit required preparing the grounds for attracting and recruiting highly credentialed faculty members, including academic physicians to grow the required balance of services that would attract privately insured and self-pay patients. Success in research is a major determinant of academic mobility to the US and globally. An environment that allows and supports achievement of the desired research outcome at AUB is a strict requirement of serious candidates contemplating to apply for appointment at AUB in Lebanon. It keeps all options of mobility open. This chapter focuses on the role and impact of bibliometric indicators, particularly in research, on transforming the prevailing steady state and culture to that of dynamic change by succeeding to recruit skilled change agents in a planned manner. Bibliometric analysis also enhances the transparency and expectations for promotion, career development, and acquisition of a long term (7 years at AUB) or tenure appointment (re-established at AUB in 2017).

The Medical Institutions at AUB needed major restructuring to move away from a consolidated status quo that became unsustainable, and to engage in a process of sustainable growth that puts them at par with peer institutions in the USA. This chapter also focuses on the role and impact of bibliometrics on building a growth-oriented research enterprise, in particular monitoring the rate of growth and achievement of targets set internally as well as benchmarking with peer institutions externally.

The mission statements of FM and the AUBMC included "… to participate in the advancement of knowledge through research … Chartered in New York State in 1863, the university bases its educational philosophy, standards, and practices on the American liberal arts model of higher education." In looking for a research vision for the future, the general recommendations from inputs of a large base of intramural and extramural stakeholders are summarized in Fig. 1. It was estimated

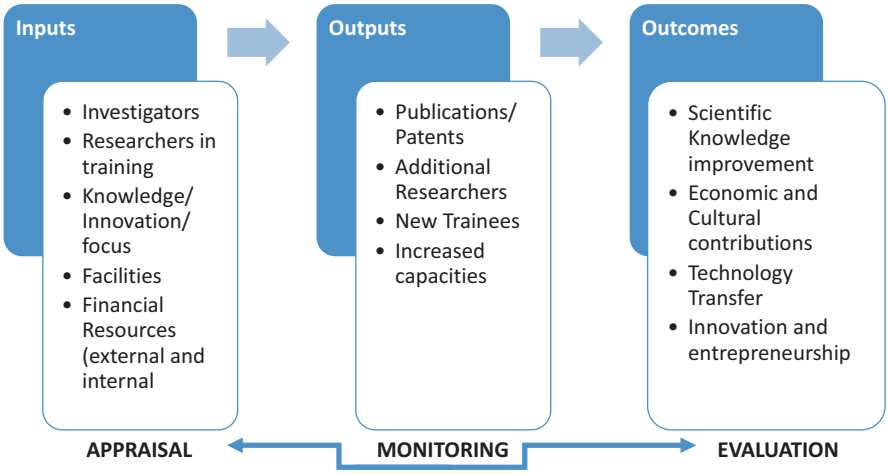



**Fig. 1** Critical mass of inputs needed to generate the defined outputs and achieve the desired outcomes

that about 400+ full time equivalents (FTEs) of faculty members/academic physicians were needed within 20 years to fulfill the mission, revive the Medical Center by rightsizing all services, strengthen and financially sustain the teaching, research, and clinical demands of the FM and Medical Center. The rate of their recruitment would parallel equipping and growing the Medical Center, including the opening of hospital beds, going up from 170 beds occupied in 1999 to a target of 425, and upgrading the associated services and facility to support the academic and patient-care programs required to achieve fiscal balance and sustainable growth.

To pave the way for expanding the research enterprise, seven core research facilities, open to all investigators in the university, were established by 1999 within a newly established Program of Cellular and Molecular Medicine in the FM, parts of which were operational as of 1997. The facilities include: core laboratories in molecular biology, protein chemistry, imaging and confocal microscopy, patch clamp, environment/analytical chemistry, radioactivity work stations with autoradiography, bioinformatics facility, as well as a modern animal-care facility ready for transgenic mice studies. The required human infrastructure for all, including that for an Institutional Review Board (IRB) and an Institutional Animal Care and Use Committee (IACUC) were concomitantly established. The objectives of the core facilities are: (a) to make available to all researchers at AUB, expensive and frequently needed multipurpose equipment; (b) train research scientists for each facility who, with the help of biomedical engineering, set up, operate, and maintain such equipment/facility and make them available to investigators with reasonable cost, waiting time, and provide them with the necessary support and training; (c) insure the availability of supplies that can be purchased by investigators without the long delay required for orders to come from abroad; (d) diminish markedly the set-up time (down-time) for new recruits, which is extremely important in attracting active

researchers with ongoing projects, to come to AUB in Beirut, Lebanon; (e) enable investigators to produce research that attracts competitive external funding; and (f) develop a critical mass of about 15 established investigators with adequate funding to re-establish the PhD program in biomedical sciences.

Sources of financial support to realize the various aspects of the mission in any university, include primarily revenues from: student tuitions, hospital and patient care, research funding, patents, return from university endowments restricted to the FM/AUBMC, donations and government subsidies, if any, to the FM/AUBMC, and share of FM/AUBMC from unrestricted university endowments and donations. Competition for the limited resources for the various aspects of the FM/AUBMC mission and among the different academic units of the university necessitates the development of clear plans with measurable indicators including metrics for quantity, quality and value, as tools to guide the decision-making process. Decisions, particularly in Lebanon and the Arab countries that have been passing through profound cycles of shifting steady states throughout the past century, cannot be made on an historical basis. The rapid pace of breakthroughs in technology and discoveries in the last half a century made this problem, albeit for a different reason, not unique for the region. The Association of American Medical Colleges (AAMC), in 1998, formed a task force that came out with recommendations for a Mission-Based Management (MBM) approach [1, 2]. Effort and money are to be matched, albeit with great difficulty, to an academic medical center's three traditional missions of education, research, and clinical care. Decisions regarding departmental support by the dean can then be made on a mission-directed rather than on historical basis [3]. In addition to time effort analysis within the traditional missions of teaching, research, clinical care, and administration, MBM includes assessment of productivity and value of each activity with its associated cost. MBM provides a tool for medical centers to optimize the alignment of institutional resources with both the existing activities of the faculty and new strategic initiatives. A number of papers discussed various approaches for the redistribution of resources based on the quantity and quality of faculty effort [3–7], provided that the obtained metrics and data, derived from actual contributions, are validated. A metric system is an important tool which, if carefully devised and properly understood, would greatly assist department chairs and deans in investing institutional resources wisely and helping them set clear targets and goals. It could also help in decision-making regarding promotion and tenure as well as accurate costing and right-sizing of faculty [8]. A literature review done in 2005 revealed that institutions in the United States predominantly used research grant levels, particularly NIH grants, as the primary benchmark to evaluate research faculty and to allocate resources, whereas European institutions use publication bibliometric data, specifically, the impact factor of the journals in which the faculty members publish [9–12]. As such, and in the absence of an NIH-like peer system in Lebanon and the region, it became important that FM/AUBMC develop policy guidelines and a metrics system that would allow it to measure and reward faculty effort in research, teaching, patient care and administration. In this chapter, the role and impact of bibliometric analysis of research productivity on faculty evaluation, recruitment, promotion, tenure appointment, rate of growth, MBM, and benchmarking are considered for the period from 1999 to 2009.

## 2 Tools, Process, and Methodology

### *2.1 Setting the Stage*

Two committees were established. (i) The Research Committee to create a system for allocating intramural research funds and acting as a grant office, and reviewing all extramural grant applications. The detailed research-proposal application form had to be adhered to with clear justification of the budget. Each application had to be cleared by the Institutional Research Board, the Institutional Animal Care and Use Committee for animal use, and reviewed by three peers. Decisions for funding were made in two cycles per year. Funding was awarded in descending order of scores; the number of proposals funded depended on the budget for that cycle. Intramural funding came primarily from the University Research Board's (URB) allocations to Medicine, the Diana Tamari Fund endowment for basic sciences until 2001, and the Deans Research Fund. As of 2003, the largest portion came from the research fund of the Medical Practice Plan. Extramural funding initially came from the Lebanese Research Council but significantly increased through competitive external funding from diverse sources; for amounts from 1998 to 2008, see Table 8. (ii) The Core Facility Committee, formed by the chairs of the users' committees for each facility, was charged with oversight, writing policies and procedures for the use of each facility including developing a process for research space allocation, timely receipt of supplies, and determining the mean wet-research-bench cost per month for various disciplines.

### *2.2 Bibliometrics*

Both committees recommended in 1996–1997 the introduction of bibliometric assessments to compliment the traditional peer-review process. Bibliometrics as defined by Tague-Sutcliffe in 1992 [13] "is the study of the quantitative aspects of production, dissemination and use of recorded information and the development of mathematical models and measures for these processes that are efficiently produced and are useful for prediction and decision making". The performance bibliometric indicators recommended included four components (a) publication frequency; (b) citation analysis [13–15] which included total citations of all the publications of an investigator, citations for each article and the average annual citations and per article, percent of self-citations, and articles with zero citations. Citation per paper measures impact with respect to output. Different fields of research may differ multiple folds in the rate of citations and hence comparisons should be strictly like for like [16–18] i.e. within the same discipline. Uncited articles reflect those with little or no impact. (c) Journal impact factor (IF) calculated by dividing the number of citations a journal receives for all articles published in the two preceding years by the number of articles published in the journal in the same period [19, 20] and

**Table 1** Relative weights for adjustments by type of publication and by position of author

| Adjustments by type of publication | Weight | Adjustments by authorship position | Weight |
|---|---|---|---|
| Original research | 1 | First/senior | 1 |
| Review/editorial | 0.75 | 2nd author | 0.5 |
| Case report | 0.50 | 3rd author | 0.25 |
| Letter | 0.25 | >=4th author | 0.15 |

measures the impact of the Journal. In its calculation, original papers, case reports, reviews, editorial, and letters are considered equivalent publications. The two FM committees hence adjusted the Journal IF for each investigator using a weight ratio for the type of article; original articles; reviews/editorials; case reports; letters, as 1.0:0.75:0.5:0.25 and for authorship position; first/senior: 2nd: 3rd: >=4th as 1:0.5:0.25:0.15, as illustrated in Table 1. In this chapter, the IF was dubbed "crude" IF and the latter, "adjusted" IF. The "crude" IFs of journals in each discipline determine the percentile rank of a journal in that discipline, allowing for analyzing the investigator's publications within their discipline. (d) H-index, introduced by Hirsch in 2005, combines the number of articles published by an investigator with the number of citations, and is calculated as the first h (number of) articles that receive h citations or more [21]. This measure relates to the investigator. There are a number of derivatives for the H-index e.g. g-index, m-index and a-index [22] that were introduced later; each is introduced to attenuate a shortfall of the H-index or others. The "crude" IF for institutional assessment is limited by size dependency; the impact index was introduced to attenuate size dependency [5].

## *2.3 Building the Database*

The curriculum vitae (CVs) of all faculty members, reaching 202 CVs from 19 departments[2] in 2007, were analyzed for the recommended bibliometric indicators, on an ongoing manner since 1997 by each department, with support from the Dean's office. A database consisting of 8212 publications, the oldest published in 1957 was built. Databases used included Institute for Scientific Information (ISI) web of science and Scopus for extracting all bibliometric data; statistical package for the social sciences (SPSS) for data analysis; Excel, Access for building the database, and Visual Basic (VB) for determining collaboration patterns. A faculty Profile Software Application[3] was built in-house as an integrated research information system with online data inputs, automatic notifications, real time analysis, and instant reports. The departments are responsible for updating the database through online

[2] The Emergency Department (ED) was established in 2004 and was not included in all data for this Chapter.

[3] Sami Cortas, Karam Rizk and Joe Max Wakim built the in-house software and packages of the Hospital Management and information Systems.

inputs by each faculty member. The process is currently significantly easier through advances in Scopus, ISI Web of Science, and Google Scholar, making online access very easy.

## 2.4 Evaluation of Education and Clinical Training

Education and clinical training is assessed by a commercial online set-up, MyEvaluations.com and MyGME, the latter for Graduate Medical Education.[4] The process includes filling online forms by students for instructor and course evaluations in both, basic sciences and the various clinical teaching activities. Online forms for peer evaluations in different activities are filled. MyEvaluation prompts by email individuals to fill the forms. Data are centrally compiled and analyzed, with capabilities of benchmarking. The FM also benefits from the AUB Office of Institutional Research and Assessment (OIRA) that uses an in-house-developed Instructor Course Evaluation (ICE) software for course, instructor, and outcome evaluations. OIRA purchased in 2014, Blue eXplorance, a Canadian software[5] for the same purpose and for 360° evaluation.

## 2.5 Clinical Workload Profile

The clinical workload profile for each faculty member was extracted from an in-house-built Hospital Management System, to which many modules were added from the 1990s through 2009. The system is updated automatically and regularly produces management reports including faculty workload profiles.

## 2.6 Faculty Effort Analysis

KPMG,[6] with the Dean's office, designed, prepared the forms and administered a process to determine the effort spent by each faculty member in teaching, research, clinical training, clinical service (patient care), academic administration, and clinical administration. After clearly explaining the purpose, process, and forms to the faculty in small groups and giving them time to fill them, the data were tabulated and analyzed for the effort and percentage of total effort spent in each activity. The

[4] MyEvaluations.com and MyGME, latter for Graduate Medical Education, are registered trademarks of MyEvaluations.com Inc. © 1998–2018. U.S. Patent #7, 899,702. All rights reserved.

[5] Blue eXplorance, Copyright 2018 © eXplorance Inc. All rights reserved.

[6] A professional service firm and one of the big four auditors worldwide. The name "KPMG" stands for "Klynveld Peat Marwick Goerdeler."

data were then entered and analyzed by a web-based software, built in-house as part of the Hospital Information System. The process was audited and the software validated by KPMG and the AUBMC IT team. On-line entry of the data and analysis thereafter on a yearly basis initiated building the database and producing annual reports.

## 3 Review of Databases, Relevance, and Outcome

The different databases, built and used as of 1997, are analyzed to define conditions at a point in time and monitor change. They are used as such, or in different combinations thereof as key indicators to determine progress towards targets and goals. Collectively, they act as a statement of conditions at a certain point in time. Means, medians, and standard deviations define where an individual stands relative to peers in each particular indicator, earmarking personal strengths, weaknesses, opportunities, and threats while defining relevant (irrelevant) indicators for that person for the future. Faculty portfolios, to a significant degree, are automatically updated and serve in the process of ongoing faculty self-evaluation and periodic evaluation for contract renewal, promotion and career planning.

### *3.1 Bibliometric Database and Selected Reports*

The report shown in Table 2 is a sample report of a selection of bibliometric indicators of faculty members in the rank of associate professor and professor in the department of Anesthesiology (AUBMC), the name of the faculty member is represented as a number. The total active years of research start from the first publication till the desired date, in this case 2007. The means and standard deviations for each of the parameters, with rank and seniority, defines the characteristics of the group and make it easier to set goals and targets for improvement through promotion and recruitment.

In comparing departmental averages for “crude” IF and “adjusted” IF with total publications in each department, shown in Table 3, it became apparent that each discipline has its characteristics with respect to bibliometric indicators. This is in agreement with observations in the literature [16–18]. Comparisons are thus made with peers in the same discipline locally and, by benchmarking, internationally. The latter was very difficult to obtain when the data collection started since determining the benchmark sample and calculating or extracting the parameters was labor intensive and difficult in 1997. Now, it is easily available on a number of accessible web-based services such as the ISI web of science, Scopus, and Google scholar.

The different types of publication(s), defined as original, review, case report, or editorial, for each investigator was included in Table 3 along with a chosen basket

**Table 2** Bibliometric profile of faculty members in the rank of associate professor and professor in a given academic department for the period from the first paper published by each till 2007 (shown here for Anesthesiology), with the mean and SD for each group

| Faculty in the Anesthesiology Department | Rank | Date of 1st publication | Total years | Total publications | IF crude/ year (all years) | IF adjusted/ year (all years) | Total citations | Average annual citations | Total citations/ paper | H-index |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Associate Professor | 1994 | 13 | **43** | 6.2 | 2.9 | **194** | 15 | 4.5 | **7** |
| 2 | Associate Professor | 1985 | 22 | **30** | 2.1 | 1.0 | **264** | 12 | 8.8 | **4** |
| 3 | Associate Professor | 1994 | 13 | **26** | 5.6 | 3.1 | **315** | 24 | 12.1 | **8** |
| 4 | Associate Professor | 1989 | 18 | **11** | 3.5 | 1.3 | **200** | 11 | 18.2 | **3** |
| 5 | Associate Professor | 1989 | 18 | **12** | 1.0 | 0.2 | **81** | 5 | 6.8 | **3** |
| 6 | Associate Professor | 1988 | 19 | **46** | 2.0 | 0.4 | **61** | 3 | 1.3 | **10** |
| 7 | Associate Professor | 1991 | 16 | **42** | 7.2 | 3.6 | **284** | 18 | 6.8 | **11** |
| 8 | Associate Professor | 1982 | 25 | **35** | 1.2 | 0.3 | **27** | 1 | 0.8 | **7** |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 | Professor | 1970 | 37 | **477** | 1.2 | 0.2 | **53** | 1 | 0.1 | **18** |
| 10 | Professor | 2000 | 7 | **32** | 4.3 | 8.0 | **18** | 3 | 0.6 | **10** |
| 11 | Professor | 1991 | 16 | **57** | 4.2 | 2.1 | **307** | 19 | 5.4 | **8** |
| 12 | Professor | 1987 | 20 | **25** | 1.9 | 0.5 | **333** | 17 | 13.3 | **3** |
| | **Mean Associate Professor** | | 18 | **31** | 3.6 | 1.6 | **178.3** | 11.1 | 7.4 | **6.6** |
| | SD Associate Professor | | 4 | **14** | 2.4 | 1.4 | **109.6** | 7.9 | 5.7 | **3.1** |
| | **Mean Professor** | | 20 | **148** | 2.9 | 2.7 | **177.8** | 10.0 | 4.8 | **9.8** |
| | SD Professor | | 13 | **220** | 1.6 | 3.6 | **165.2** | 9.3 | 6.1 | **6.2** |

**Table 3** Bibliometric profile of each academic department in the Faculty of Medicine from 1997 to 2007 reflecting crude IF and adjusted IF, both per year, the total publications and the total number of original papers and those on which the author is a senior author. Total citations and those for the original articles with the particular investigator as senior

| Department average | IF crude/ year | IF adjusted/ year | Total publications | Original | Original and senior | Total citations | Citations (original and senior) | H-index |
|---|---|---|---|---|---|---|---|---|
| Anesthesiology | 4.7 | 2.1 | **27.4** | 12.9 | 6 | **278** | 30 | **7** |
| Biochemistry | 15.3 | 8.1 | **26.5** | 25.3 | 9.3 | **1039** | 398 | **19** |
| Dermatology | 1 | 0.4 | **6.5** | 0.9 | 0 | **106** | 16 | **5** |
| Diagnostic Radiology | 4.4 | 1.4 | **28.6** | 10 | 2.9 | **204** | 50 | **5** |
| Emergency Medicine | 0.4 | 0.2 | **5.3** | 2 | 1 | **14** | 0 | **1** |
| Family Medicine | 1.5 | 0.9 | **9.5** | 6.1 | 2.6 | **28** | 6 | **2** |
| Human Morphology | 10.1 | 6 | **34** | 30.8 | 16.6 | **431** | 151 | **10** |
| Internal Medicine | 10.4 | 5.5 | **30.9** | 16.5 | 8.3 | **539** | 199 | **9** |
| Microbiology and Immunology | 3.6 | 2.4 | **26.7** | 23 | 18 | **281** | 116 | **6** |
| Obstetrics and Gynecology | 5 | 2.6 | **27.5** | 14.3 | 8.1 | **269** | 108 | **8** |
| Ophthalmology | 6 | 3.6 | **35.2** | 20.5 | 12.7 | **245** | 116 | **8** |
| Otolaryngology | 2.2 | 1.2 | **23.4** | 11.9 | 9.4 | **129** | 59 | **7** |
| Pathology and Lab Medicine | 4.8 | 1.8 | **24.8** | 14.6 | 5.3 | **227** | 70 | **6** |
| Pediatrics | 7.6 | 3.9 | **21.9** | 15.6 | 7.6 | **551** | 162 | **8** |
| Pharmacology | 1.7 | 1.3 | **6.3** | 6 | 4 | **115** | 23 | **6** |
| Physiology | 9 | 6 | **21** | 20.5 | 11.3 | **430** | 133 | **9** |
| Psychiatry | 4.8 | 3.3 | **9** | 7.3 | 2.7 | **192** | 178 | **4** |
| Surgery | 2 | 1 | **15.1** | 11.1 | 5.2 | **122** | 37 | **5** |
| Average | 5 | 3 | **21** | 14 | 7 | **289** | 103 | **7** |
| SD | 4 | 2 | **10** | 8 | 5 | **245** | 97 | **4** |

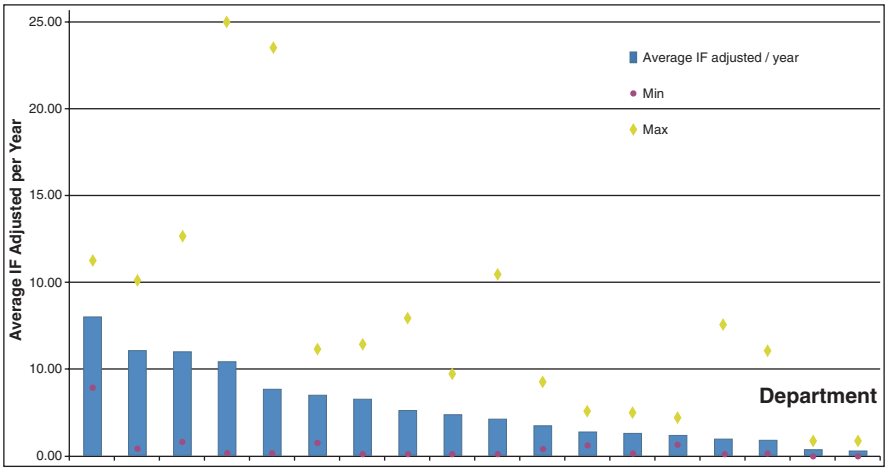
of bibliometric indicators. Most articles in the biomedical literature are multi-authored. Usually the senior author is either listed the first or last. In the latter situation, the first author would have contributed significantly to developing methodology and performing bench/ground work while the senior author, in addition, would have developed the research proposal, obtained funding, and normally the work is done in space allocated by the institution to the senior investigator. Each of the other listed names would have contributed variably to the work. The Research Committee conducted a survey and recommended that different weights be given to the type of publication and position of the investigator in the author's list as presented in Sect. 2.2. The bibliometric indicators available in 1997 included citation analysis, the Journal IF, and the ranking of Journals by IF in each discipline. The "adjusted" IF was an attempt to customize the "crude" IF to the investigator's publications while realizing that the "crude" Journal IF is an average of all articles in the journal. The H-index and its derivatives were introduced as of 2005 and beyond.

The process of creating a bibliometric database started initially by analyzing the curriculum vitae (CV) of each faculty member. The IF of journals in which each article is published was obtained from ISI web of science and later Scopus. The sum of IFs for journals of all articles in a CV is considered as the "crude" IF of the faculty member. The list of publications was then analyzed for the type of publications and the position of the author. The "adjusted" IF is calculated as described in Sect. 2.2. The sum "adjusted" IF was calculated for each investigator. The mean "adjusted" IF for each department is computed and shown in Table 4 with the minimum and maximum for each department. The differences between departments were not only related to differences in discipline but also to funding, proportion of active researchers, total number of faculty members, particularly in smaller departments with higher teaching or clinical workload per faculty member.

## *3.2 Collaboration Patterns*

Collaboration within the institution resulted in higher and more comprehensive multidisciplinary productivity. Collaboration with international investigators, studied for the years 1991–2001 resulted in more original publications than work done at AUB only (65% vs 35%, $p < 0.001$, and a higher "crude" journal IF for the publications $3.20 \pm 3.85$ vs $1.71 \pm 2.36$, $p < 0.05$ [23]. Software built in-house generates a matrix of the number of papers written in intra- or inter-departmental collaboration at FM as shown in Table 5. The software can be used to map collaborations with international investigators. The caption for Table 5 is self-explanatory.

**Table 4** Mean adjusted IF on the vertical axis, shown as bars for each department and represented on the horizontal axis from highest to lowest. The minimum for each department is shown by "red dots" and the maximum by "yellow diamonds." The names of the departments are withheld to avoid biased interpretation (see text)




## 3.3 *Faculty Research Profile*

A faculty research profile was drafted as shown in Fig. 2 and updated on a yearly basis. The bibliometric indicators were used to monitor trends, set goals and targets. "Crude" IF and other bibliometric indicators are among the determinants of competitive funding from Europe. The faculty research profile shows at a glance, the total number of articles published by each faculty member, the number published since last contract or promotion, the number of papers in which the investigator was the first or senior author (Fig. 2), the number of each type of publication, with S next to the number of articles in which the investigator was the senior author, the total "crude" and "adjusted" IFs and each shown per year, total citations and annual citation rate, H index, and the number of articles and types, published in journals above the 75th percentile, between the 50th and 75th percentile, and below the 50th percentile in discipline.

The H-index was introduced in 2005 [21] and its computation was added to the research database. The H-index was correlated with the number of publications, total citations, and "adjusted" IF in 2008, for faculty members at FM/AUBMC with H-index above 15 as shown in Table 6. The mean ± SD for the 17 faculty members for number of publications is 52 ± 28; for total citations is 1676 ± 1606; for "adjusted" IF is 10.13 ± 5.11, and for H-index is 20 ± 8. Pearson's r-value for correlation of H-index with number of papers is 0.181 (NS), with citations is 0.978 ($p < 0.0001$), and with adjusted impact factor is 0.474 ($p < 0.001$). This supports our use of the "adjusted" IF as a bibliometric indicator for research productivity at the FM.

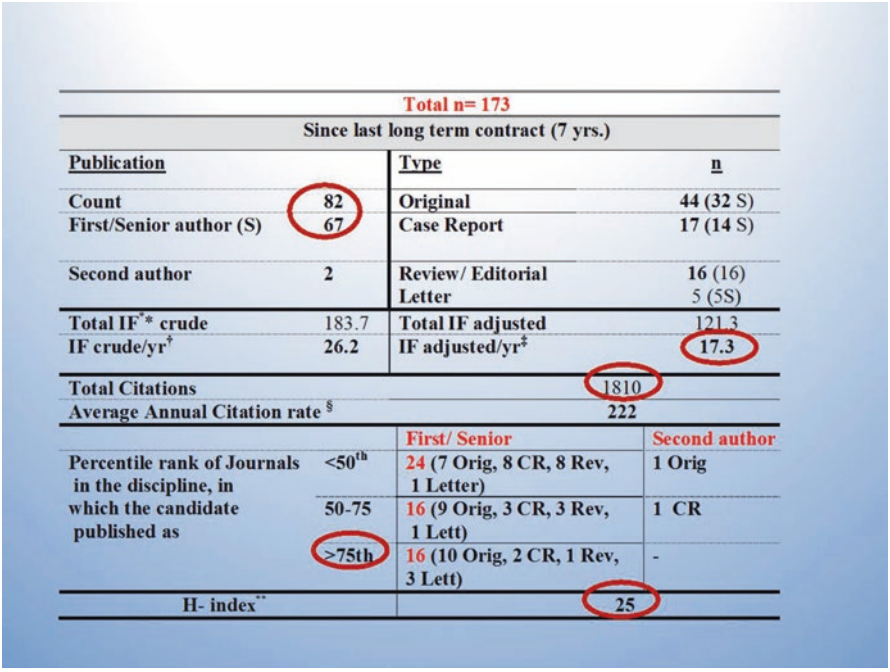
**Table 5** Intra- and inter-collaboration matrix within and across departments in the FM/AUBMC. All departments are listed alphabetically on both, the horizontal and vertical axes. The number of papers at the intersection of column for one department and the row of the other indicates the number of article done in collaboration by the two departments. The darker the intensity of the color in each square, the higher the collaboration

| | Anesthesia | Biochemistry | Dermatology | Diagnostic Radiology | Family Medicine | Human Morphology | Internal Medicine | Microbiology | ObGYn | Ophthalmology | Otolaryngology | Pathology & lab Medicine | Pediatrics | Pharmacology | Physiology | Psychiatry | Radiation Oncology | Surgery |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Anesthesia | 236 | | | | | | 1 | | 1 | 1 | 7 | 1 | 2 | | | | | 12 |
| Biochemistry | | 2 | | | | 2 | 3 | | | | | | 6 | 1 | 1 | | | |
| Dermatology | | | 23 | | | 2 | 5 | | 2 | | 1 | 1 | 1 | | | | | 1 |
| Diagnostic Radiology | | | | 77 | 1 | | 18 | | 4 | 2 | 2 | 13 | 4 | | | 1 | | 12 |
| Family Medicine | | | | 1 | 29 | | 2 | | 1 | | 1 | 5 | 7 | 1 | | 1 | | 2 |
| Human Morphology | | 2 | 2 | | | 16 | 32 | | 1 | | | 4 | 17 | | 39 | 5 | | 6 |
| Internal Medicine | 1 | 3 | 5 | 18 | 2 | 32 | 234 | | 41 | 5 | 2 | 40 | 18 | 4 | 15 | 3 | 2 | 37 |
| Microbiology | | | | | | | | 10 | | | 2 | 1 | 1 | | | | | 2 |
| ObGYn | 1 | | 2 | 4 | 1 | 1 | 41 | | 211 | 3 | | 9 | 9 | | | | 1 | 6 |
| Ophthalmology | 1 | | | 2 | | | 5 | | 3 | 151 | | | 1 | | | | | 1 |
| Otolaryngology | 7 | | 1 | 2 | 1 | | 2 | 2 | | | 33 | 13 | 2 | | | | | 4 |
| Pathology & lab Medicine | 1 | | 1 | 13 | 5 | 4 | 40 | 1 | 9 | | 13 | 28 | 12 | 1 | 1 | | | 19 |
| Pediatrics | 2 | 6 | 1 | 4 | 7 | 17 | 18 | 1 | 9 | 1 | 2 | 12 | 103 | 1 | 4 | 1 | | 21 |
| Pharmacology | | 1 | | | 1 | | 4 | | | | | 1 | 1 | | | | | |
| Physiology | | 1 | | | | 39 | 15 | | | | | 1 | 4 | | | 4 | | 6 |
| Psychiatry | | | | 1 | 1 | 5 | 3 | | | | | | 1 | | 4 | 6 | | 1 |
| Radiation Oncology | | | | | | | 2 | | 1 | | | | | | | | | 1 |
| Surgery | 12 | | 1 | 12 | 2 | 6 | 37 | 2 | 6 | 1 | 4 | 19 | 21 | | 6 | 1 | 1 | 119 |

## *3.4 Lessons from Benchmarking*

In 2008, Dean Hendrix published an article entitled, "An analysis of bibliometric indicators, National Institute of Health funding, faculty size at the Association of American Medical Colleges (AAMC) medical schools, 1997–2007" [24]. The same parameters were obtained for FM/AUBMC for the same period. The means, SD, and coefficient of variance of the collected and synthesized bibliometric indicators reported, in addition to NIH funding and faculty size for the 123 AAMC registered medical schools, taken from Table 3 of Hendrix's publication [24] are shown here in rows 2–5 of Table 7, alongside data from FM/AUBMC in the bottom row.

The FM/AUBMC fits within the distributions of all the size-independent parameters reported for the USA schools, although the data were collected for FM/AUBMC, a decade after emerging from war, during which teaching and service loads per faculty were very high while research facility and funding were limited. A



| Total n= 173 | | | |
|---|---|---|---|
| Since last long term contract (7 yrs.) | | | |
| **Publication** | | **Type** | **n** |
| Count | 82 | Original | 44 (32 S) |
| First/Senior author (S) | 67 | Case Report | 17 (14 S) |
| Second author | 2 | Review/ Editorial | 16 (16) |
| | | Letter | 5 (5S) |
| Total IF* crude | 183.7 | Total IF adjusted | 121.3 |
| IF crude/yr† | 26.2 | IF adjusted/yr‡ | 17.3 |
| Total Citations | | 1810 | |
| Average Annual Citation rate § | | 222 | |
| | | First/ Senior | Second author |
| Percentile rank of Journals in the discipline, in which the candidate published as | <50th | 24 (7 Orig, 8 CR, 8 Rev, 1 Letter) | 1 Orig |
| | 50-75 | 16 (9 Orig, 3 CR, 3 Rev, 1 Lett) | 1 CR |
| | >75th | 16 (10 Orig, 2 CR, 1 Rev, 3 Lett) | - |
| H- index** | | 25 | |

**Fig. 2** Sample of a faculty research profile with the total number of papers published to date shown on top center e.g. n = 173. Data since the last contract or promotion are entered below. *Abbreviations*: *IF* impact factor, *S* senior author, *Orig* original article, *CR* case report, *Rev* review, *Lett* letter

relatively small group of faculty, however, continued to produce research with good citation indices while a significant number could not do much research. This is reflected in the 44% of articles from FM/AUBMC with no citations, i.e. 2 SD below the mean of US medical schools in this parameter (Fig. 7, column 6). This was the lowest score for FM/AUBMC. Values for size-independent variables approach a normal distribution, with FM/AUBMC being: 1.4 SD below the mean for average citation per article, close to the University of Texas Medical Branch at Galveston; 1.2 SD below the mean in impact index, close to Medical University of South Carolina, Universities of Nebraska and Illinois; 1.3 SD above the mean in average number of publications per faculty, close to University of Texas Medical Branch at Galveston and 0.19 SD below the mean for average citations per faculty member, almost within the median. The values for the size-dependent parameters: total published articles, total citations, average number of faculty, and NIH funding do not follow a normal distribution curve, with means significantly higher than medians for these parameters and coefficients of variation above 1, reflecting tremendous variance for these size-dependent variables.

A study on research productivity at FM/AUBMC for the period 1996–2001 [23] revealed that in this 6-year period 18% of the faculty had no publications and only

**Table 6** Total publications, total citations, adjusted IF of faculty members at FM/AUBMC members with H-index equal or above 15 in 2008

| Faculty member | Total publications | Total citations | IF adjusted/year | H-index |
|---|---|---|---|---|
| 1 | 67 | 7576 | 16.78 | 48 |
| 2 | 88 | 1724 | 12.39 | 24 |
| 3 | 36 | 2387 | 10.23 | 23 |
| 4 | 43 | 2025 | 18.92 | 23 |
| 5 | 47 | 1959 | 9.48 | 21 |
| 6 | 60 | 1294 | 20.11 | 19 |
| 7 | 29 | 929 | 8.33 | 18 |
| 8 | 41 | 758 | 3.69 | 18 |
| 9 | 43 | 1589 | 5.68 | 18 |
| 10 | 138 | 1741 | 9.13 | 17 |
| 11 | 25 | 1082 | 9.55 | 16 |
| 12 | 26 | 903 | 3.78 | 16 |
| 13 | 39 | 821 | 5.73 | 16 |
| 14 | 47 | 948 | 11.24 | 16 |
| 15 | 58 | 850 | 12.31 | 16 |
| 16 | 64 | 1011 | 12.24 | 16 |
| 17 | 31 | 743 | 2.67 | 15 |
| **Mean** | **52** | **1667** | **10.13** | **20** |
| **SD** | **28** | **1606** | **5.11** | **8** |
| **Correlation coefficient (total publications, H-index)** | | **0.18** Pearson's r: $p$ is NS | | |
| **Correlation coefficient (total citations, H-index)** | | **0.98** $p < 0.0001$ | | |
| **Correlation coefficient (total IF adjusted/year, H-index)** | | **0.47** $p < 0.001$ | | |

Correlation coefficients r, are shown for correlating H-index with number of publications r = 0.18 (NS), with Citations r = 0.98 ($p < 0.0001$) and with "adjusted" IF r = 0.47 ($p < 0.001$)

20% had two or more publications per year. There was a significantly higher annual publication rate, expressed as publications per faculty per year (PFY), among newly recruited faculty; 1.67 ± 1.43 for those appointed after 1995; 1.45 ± 1.24 for those appointed during 1990–1995, and 0.93 ± 1.40 for those appointed before 1990 ($p < 0.007$), and higher among those who are younger in age ($p < 0.01$). Collaboration with international investigators resulted in a significantly higher number of original articles with higher "crude" IFs [23].

As to funding, Table 7 needs clarification. The mean NIH funding per faculty member in the USA in 8 years is $695,042 making the mean annual funding per faculty per year $86,880. This figure usually includes, in addition to bench/ground costs, overhead costs to the university, some equipment, salaries of technical assistance, and a pro-rata portion of the investigator's salary for the time spent on the project. The FM/AUBMC figure of $64,350 for 10 years, translating to $6435 per faculty per year is non-representative. The average number of faculty funded during this period was 48/192, making the mean awarded amount per funded faculty per

**Table 7** Bibliometric indicators of FM/AUBMC shown as mean, alongside similar data that include means of the collected and synthesised bibliometric measures of 123 medical schools in the USA [24]. Total funding at AUB is not from NIH

| | Published articles, 1997–2007 | Citations to article published, 1997–2007 | Average citations per article, 1997–2007 | Impact index, 1997–2007 | Percentage of articles with no citations, 1997–2007 | Average number of faculty, 1997–2007 | Total NIH funding, 1997–2005 (US dollars) | NIH funding per faculty member, 1997–2005 (US dollars) | Average number of publications per faculty member, 1997–2007 | Average number of citations per faculty member, 1997–2007 |
|---|---|---|---|---|---|---|---|---|---|---|
| Mean (μ) | 9524 | 162,883 | 14.12 | 3.19 | 30.90% | 823 | $624,039,284 | $695,042 | 10.27 | 157.08 |
| Median | 6779 | 88,708 | 13.67 | 3.16 | 30.20% | 713 | $355,369,774 | $546,853 | 9.32 | 133.06 |
| Standard deviation (σ) | 10,828 | 244,785 | 4.55 | 0.63 | 6.30% | 638 | $665,327,229 | $521,982 | 5.6 | 122.54 |
| Coefficient of variation ($C_v$) | 1.14 | 1.5 | 0.32 | 0.2 | 0.2 | 0.78 | 1.07 | 0.75 | 0.55 | 0.78 |
| FM/AUBMC | 3370 | 25,658 | 7.61 | 2.45 | 44% | 192 | 12,355,226 | 64,350 | 17.55 | 133.64 |

year as $25,740, net of overhead, equipment, and investigator's salary portion. Overhead for external grants at AUB ranged from 0% to 20% e.g. the Lebanese National Research Council does not accept an overhead charge for its grants and European agencies hover around 10%, others go up to 20–22%, making the weighted average around 15% for external funding.

Determinants of internal funding included clarity of the proposal and its feasibility within the available facility, proposed budget, focus of the investigator and rate of productivity. All these were initially scored by peer evaluation, three referees per proposal. As experience developed, productivity was evaluated in addition, through a basket of bibliometric indicators.

The amount of funding depended on statistical analysis of costs of effective research at FM/AUBMC on a 5-year rolling basis, with the first period being 1995–2000. The cost of a wet -research-bench per month during that period ranged from $800 to $2000/month ($9600–$24,000/year), depending on the type of work; justified exceptions in a proposal were evaluated from available unit costs. The cost of a research assistant during that period was $6000–$8000 per year. Awards for wet research, therefore, range from $15,600 to $32,000 per year. Clinical research had a significantly higher variance in cost than basic wet research, depending on its nature, but the overall average during that period was slightly below the minimum of wet bench research.

## *3.5 Relevance and Outcome in Growth of Publications and Funding*

Historically, internal funding was distributed "equitably" to all faculty members that submitted a proposal. A review of the process revealed that the money given is thinly spread and the amount to each investigator was inadequate for meaningful research. Groups of faculty members pooled their resources and worked jointly on a project. This was possible when there is a critical mass of investigators that can work on the same project.[7] A number of faculty members were left out to produce work without the needed support and hence a large number of publications had no citations. They were done to satisfy requirements for promotion, and 20% of faculty members had no publications between 1996 and 2001 [23]. The "equitable" became inadvertently "inequitable".

The funding policy was changed to define adequate support for each project (Sect. 3.4), the proposals were ranked and prioritized and the available money was given, without changing the proposals' approved budgets. Awards were given in descending priority until the money ran out. Some applicants did not get funding for that cycle. The adequate funding provided, research facility, research infrastructure, and the inclusion of bibliometric indicators in assessing research productivity, and

[7] The group in neurosciences at FM/AUBMC is an example, that also linked with investigators in the Faculty of Engineering.

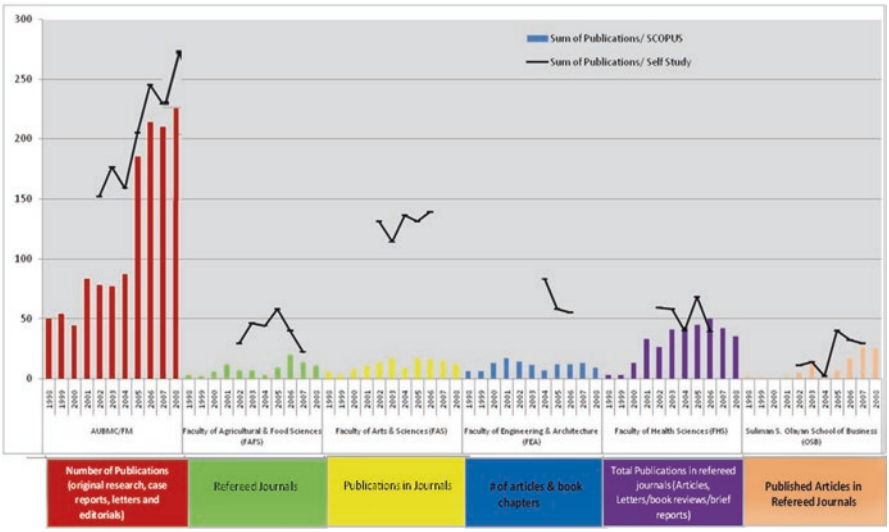



**Fig. 3** Number of publications of AUB Faculties/Schools. The black lines above the bar graphs include publications extracted from all curriculum vitae of faculty members and input of recent publications to the Dean's office. The bar graph is extracted from Scopus for the years 1998 to 2008. The left-most panel is for the FM/AUBMC, followed by the Faculty of Agriculture and Food Sciences, Faculty of Arts and Sciences, Faculty of Engineering and Architecture, Faculty of Health Sciences (Public Health), and Suleiman Olayan School of Business. All publications represented in bars, are in peer reviewed and indexed journals as shown in the box below each faculty/school. This chart was prepared in 2008 by the provost for the AUB Self-Study, in preparation for reaccreditation by the Middles States Commission on Higher Education. (Source 1: Data from Working Group Five on Faculty responsible for writing "Faculty Chapter" in AUB Self-Study Report for AUB reaccreditation by Middle States Commission on Higher Education (2007–2008). Source 2: SCOPUS affiliation search by Faculty)

in promotion, resulted in a quantitative and qualitative shift in research productivity as shown in Fig. 3. The number of articles published each year, taken from the CVs, increased by 4.2-fold, from 67 articles in 1997 to 282 articles in 2008; and by 4.7-fold, from 50 articles to 236 articles indexed in Scopus. The bars represent data from Scopus and the solid black line above the bar graphs indicate the number of publications counted from the CVs. The number of articles per faculty per year increased by four-fold as per Scopus. The increase in the number of articles per Scopus was sustained beyond 2008, albeit by a 2.0-fold increase in publications, from 236 articles in 2008 to 463 articles in 2017 and a 1.5-fold increase in the number of articles per faculty member.

The number of publications started to increase as of 1997, with a jump in 2001 and another larger jump in 2005. The jump in 2001 is related to the establishment of the core research facilities that started to be operational as of 1997, but completely established in 1999 and to the newly introduced funding process; this gave the faculty on board the opportunity to increase their productivity, and succeed in attracting new younger active faculty to join FM/AUBMC as of 1995. The second jump in

**Table 8** Intramural and extramural research funding for investigators at the FM/AUBMC from 1998 to 2008

| | 1998–2001 | 2001–2004 | 2004–2008 | Total |
|---|---|---|---|---|
| Intramural | 983,515 | 1,490,478 | 1,888,506 | 4,362,499 |
| Extramural | 703,220 | 2,110,202 | 5,179,305 | 7,992,727 |
| Total funding | 1,686,735 | 3,600,680 | 7,067,811 | 12,355,226 |

2005 was due to increased intramural research funding generated by the Medical Practice Plan (MPP), introduced in 2002, as shown in Table 8. The gap between the solid black line and bar values indicates that almost all published articles became indexed.

There are three major operational revenue sources at the FM/AUBMC: (i) student tuition for all teaching programs; (ii) patient-care revenue for all services at the medical center; and (iii) professional-fee revenue. In principal, students should not subsidize patient care and vice versa, similarly, academic physicians, as an association of independent contractors, should be paid for their teaching contributions and patient-care services but should not be subsidized further by students or from services of the medical center. They should be responsible for their costs, including benefits, cost of clinics/practice offices they use, and in addition, should contribute to investments for their individual and group professional-career growth. The latter expenses which included contribution to intramural research funds, trips to conferences, and paying recoupable support to newly recruited physicians, was set at a certain percentage of professional fee earnings and was made as a contribution to a Dean's Development fund (MDDF) for the purposes described. All net professional fee revenue otherwise goes back to the physicians with clear mechanisms for its sharing and distribution through group practices. The MPP defines, organizes, and legalizes the professional practice at the medical center. The increase in intramural research funding as of 2002 came from the MPP's Dean's fund (MDDF). The resulting increased research productivity increased the competitiveness of investigators at the FM/AUBMC, increasing extramural funding by about 5.5-fold between 1998 and 2008 (Table 8) and reversing the ratio of external to internal funding from 0.7 in 1998–2001 to 2.7 in 2004–2008.

## 4 Role and Impact of Bibliometrics in Recruitment and Promotion

Historically, the policy for recruitment and promotion at FM/AUBMC required a specific number of publications for each rank, usually accomplished within a specified period of time. Evaluation of research was through peer review, which is characterized by expert opinion evaluating content, thought process, focus, relevance, worth in discipline, fundability, and potential sustainability. The review process contributes to peer learning and research improvement. The limitations of peer

review include subjectivity, possible bias, inconsistency, being time consuming with variable response rate, and is relatively costly. The peer-review process is very well developed in the USA, with growing experience, evolving through the peer-review process for NIH funding, expanding rapidly in time to a multibillion US dollar budget. The outcome from NIH research contributed to important ground-breaking discoveries and patents; 153 Nobel Prize laureates received NIH funding.[8] The success of this process made NIH funding a major determinant of research productivity [12] and to a large degree, of recruitment, promotion, and tenure appointments in medical schools in the USA. Although there is similarity between the research enterprise in the USA and west Europe, this is not the case for west Europe where paid skilled peers are selected to evaluate proposals, the system does not have the collective historic experience and there is more need to depend on measurable key indicators. That is why measurable key indicators, primarily the journal IF, became a significant determinant of research evaluation in Europe [12]. At FM/AUBMC, the University invites a specified number of peer referees, usually from the USA and sometimes from Europe and/or elsewhere, to review and evaluate the candidate's research productivity. This provides an international dimension. Referees are selected by the President of the University, Dean of the Faculty, Chair of the Department, and candidate for promotion. There is no critical mass of qualified peers in all disciplines in Lebanon and the region and the few that exist would be overwhelmed by the process. Unless the candidate for promotion has been recruited from the US and has passed there through the process for recruitment, promotion and/or have been awarded NIH funding in the USA, the "peers" find it difficult to evaluate productivity in Lebanon. Variants of the following statement is often seen in their letters, "I do not know (the candidate), s/he seems to have the number of publications required for promotion at your institution. I cannot compare him with candidates for promotion at our institution. Senior colleagues at your institution are best fit to evaluate her/his work". This was particularly true with candidates that had the required number of publications but no citations. Introduction of measurable indicators, as in Europe, to supplement the peer-review process, became imperative. Bibliometric evaluation is objective, verifiable, reproducible, discipline specific, and may be benchmarked. Limitations include the requirement for trained evaluators, is subject to false interpretations by non-experts, and does not directly address content, thought process, focus, relevance, and worth in discipline. The bibliometric indicators used are shown in the faculty profile (Fig. 2 and in Table 7) for benchmarking with USA medical schools. The journal "crude" IF was adjusted, as presented in Sect. 2.2, for the author's specific types of publications and position as an author. The "adjusted" IF was informally determined in 1998 for 40 faculty members recently promoted to associate professors with tenure, in different departments/disciplines of eight medical schools in the USA, three of which are in top-ranking universities. The "adjusted" IF was less than 8 in 5/40 recently tenured faculty members and less than 6 in 1 faculty member. An FM target of 8 "adjusted" IF was set for statistical purposes, to determine the approximate number of faculty

[8] NIH website.

members that have a research productivity that matches those that may qualify for tenure in the USA, or long-term 7-year contracts at AUB. Passing this threshold, adjusted to the discipline, only helped in initiating the process of applying for long-term contracts at AUBFM but its success depended on fulfilling all criteria for such a promotion.

In addition to the research profile, the education profile, and for practicing faculty, the clinical workload profile as well as lists of patents, invited lectures, and funding became part of the package sent to the referees. The available information gave the referee all the essential basic information at a glance and allowed them to focus on content, thought process, relevance in the field, and future potential. Many referees compared the candidate to those in their institution and, for some candidates, stated that they would qualify for tenure there. Response rates improved significantly and referees made comments on the adequacy of the package, such as "Thank you for asking me to comment on the promotion of (name). I appreciate receiving such a comprehensive package and especially being provided with the quantitative and analytic materials on (name) I do not know (name) personally but, I am impressed by the provided materials …"[9]; and also "The packet sent is the most complete candidate information I have received in over 20 years. The university is to be congratulated for its inclusiveness…."[10]

## *4.1 Lessons Learnt from Bibliometrics in the Promotion Cycle*

The candidate either initiates the process of promotion or is reminded that it is time to apply. The application is submitted to include all profiles discussed in Sect. 4. Letters to peer referees are sent. All applications are discussed by meetings of members of the department in the rank to which candidates are applying and higher. The candidates are compared to peers in the rank. The chair adds his recommendations in a letter with the minutes of the meeting. The dean discusses applicants from all departments with the Dean's Advisory Committee, consisting of senior professors elected by the faculty assembly and includes representations of basic science, medical, surgical, and service departments. The dean submits his letter, with the entire package including minutes of all meetings, the chair's letter and responses of the peer referees to the Board of Deans (BOD) where candidates are compared with those from all other Faculties of the University. Each dean defends his recommendations. The BOD makes recommendations on each candidate to the President, who submits the packages with the BOD's and his input to the Board of Trustees, the guardian of standards of the University, for final decision. The process is illustrated in Fig. 4.

[9] Judith S. Palfrey, MD, The T. Berry Brazelton Professor of Pediatrics, Harvard Medical School. Chief, Division of General Pediatrics, Children's Hospital Boston, letter to Dean Nadim Cortas dated December 18, 2007.

[10] Richard A. Kozarek, M.D. Professor of Medicine, Director of Digestive Disease Institute, Chair of GI research, Virginia Mason Medical Center. Letter dated October 27, 2006.

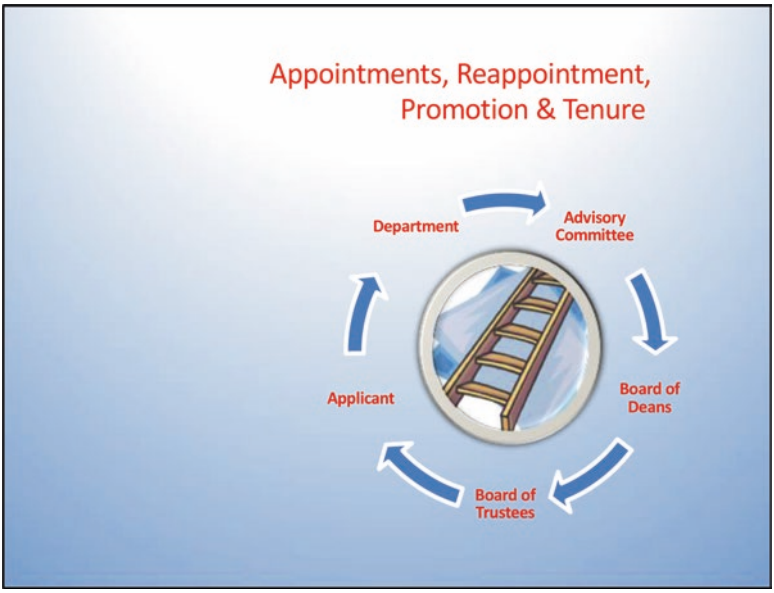



**Fig. 4** Appointment, reappointment, promotion, and 7-year, (tenure since 2017) cycle at the Faculty of Medicine, AUB. The Dean's Advisory Committee is elected by the faculty at large from full professors representing the basic science, surgical, medical (non-surgical) and clinical service departments, all other bodies are ex-officio

Data from the research profile of each applicant are pooled and analysed for the mean and standard deviation for each indicator in a defined group. The data for the "adjusted" IF are presented for all applicants for promotion to associate professor and to professor, pooled together and independently. Most research universities in the USA link promotion to associate professor to tenure. The rank otherwise becomes modified. The applicants to both ranks are reported and pooled to see on one graph, the candidates above the informally set threshold for long-term contract or tenure. The data for 1998–2008 are shown in Fig. 5 for candidates for promotion and Fig. 6 for promoted candidates. The diamonds represent candidates with "adjusted" IF of 6 or above, 15 candidates were above 8 and 10 were from 6 to 8. The trend line, obtained by linear regression, for all applicants had a positive slope. The troughs and peaks were due to the particular mix of candidate disciplines in each year. Examining Fig. 6, the trend line is 1.38-fold steeper than that of Fig. 5. If the trend continues, the trendline will hit the threshold mark not long after 2010, allowing for troughs and peaks. This will make a significant proportion of those promoted in the unmodified university track above the threshold, with the ultimate target to have almost all those promoted to associate professor in the future, potentially eligible for becoming tenure. Many other criteria, in addition, must be satisfied for such a promotion. It is interesting to note that AUB re-established tenure appointment in 2017 and all applicants for the first cycle were evaluated by tenured professors chosen by the university from a tenured pool of professors in the

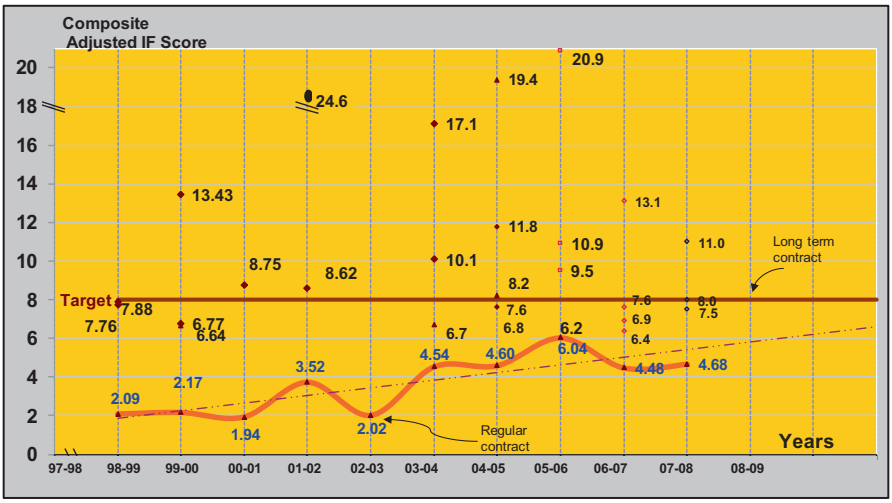



**Fig. 5** Research productivity of all *applicants* for promotion in the Faculty of Medicine by year. The "adjusted" impact factor on the vertical y-axis is shown as a function of time in years on the horizontal x-axis. The solid wavy line connects the mean "adjusted" impact factor for all applicants for each year. The solid line, parallel to the horizontal axis represents the chosen "target" threshold "adjusted" IF of 8, above which candidates are to be considered, for long term or tenure appointments. Candidates with "adjusted" "impact factor of 6 or above are indicated by "diamond" points. The "dotted" line shows the trend line, obtained by linear regression, of mean adjusted IF over time

USA. Twenty-six applied from the FM and 20 were awarded tenure, 16 of those would have been predicted from this model and are included in the "diamonds" in Fig. 6 or, for appointees recruited as professors during that period, with high H indices in addition, shown in Table 6. There were three borderline cases, two made it and one did not. The other four had tenure appointments in the USA and were recruited later to senior positions at FM/AUBMC.

A new FM policy was introduced in 2002 for appointment, re-appointment, and promotion. It defines the requirements for promotion in three tracks, an unmodified university track, e.g. assistant, associate or professor; a modified suffixed track e.g. assistant, associate or professor of clinical (specialty name inserted e.g. internal medicine, surgery), and a prefixed rank e.g. clinical assistant, associate, or professor of (specialty name inserted). Appointees in all tracks contribute variably to the teaching programs in the FM. Appointees in the unmodified track can be made by all departments in the FM and holders are expected to contribute a significant effort in research and ultimately, acquire external funding, although some may do that through their practice. The requirements for promotion in this track are the same as for all other Faculties of the University.[11] Appointees in the modified tracks are for faculty with significant clinical practice and are appointed by any of the clinical departments at the

[11] The unmodified university track was renamed in the policy approved in 2012, the investigators track with scientist investigator and physician investigator sub-tracks.

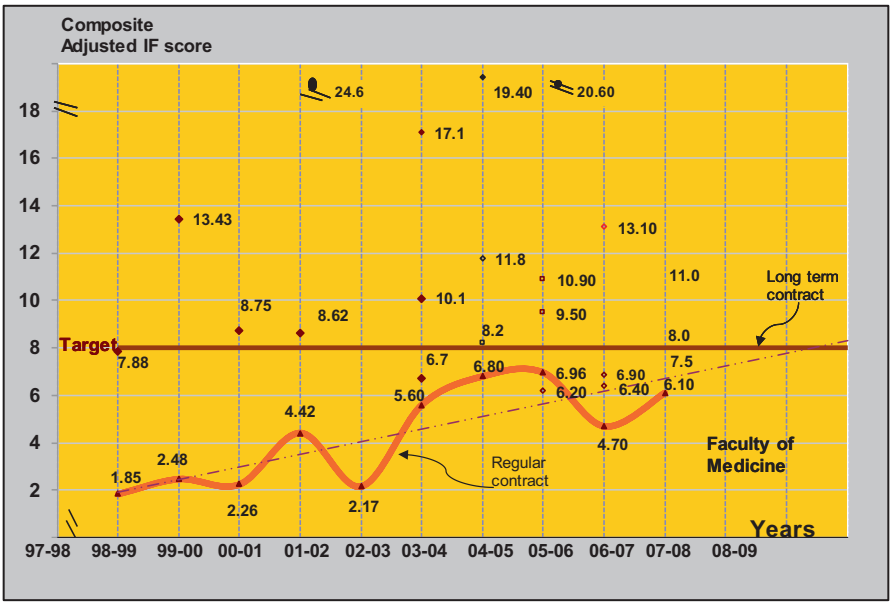



**Fig. 6** Research productivity of all *promoted applicants* in the Faculty of Medicine by year. The "adjusted" impact factor on the vertical y-axis is shown as a function of time in years on the horizontal axis. The solid wavy line connects the mean "adjusted" impact factor for all applicants for each year. The solid line, parallel to the horizontal axis represents the chosen "target" threshold "adjusted" IF of 8, above which candidates are to be considered, for long term or tenure appointments. Candidates with "adjusted" impact factor of 6 or above are indicated by "diamond" points. The "dotted" line shows the trend line, obtained by linear regression, of mean adjusted IF over time

FM. Appointees in the suffixed track[12] will spend 600 h per year at the discretion of the department chairperson in basic and clinical teaching, in research and in administration, while appointees in the prefixed track[13] will spend 300 h at the discretion of the chairperson for the purpose and more time in clinical practice. The discretionary time was modified in the 2012 revision of the policy and expressed as % of effort. The expected scholarly output in each category is defined in an appendix to the policy of 2002. Full-time appointees in the three tracks who are involved in patient care participate in the MPP. The new definition of the prefix track in 2002, allowed a number of part-timers from the 1970s to 1990s to transition to full time. Among the goals of this policy is to define further essential groupings within the faculty and build adequate critical masses in each. The standards expected for promotion in the three tracks did not differ significantly and hence appointees in the modified tracks were given 1 year and 4 years more respectively to achieve the requirements for promotion to the associate professor and professor ranks in their track. For this reason and because the number of applications from each group is small, candidates applying to the same rank from the three tracks were pooled. This contributed to the "wavy" lines in Figs. 5

[12] Suffixed clinical track was renamed in the 2012 policy as the Physician-educator track.

[13] Prefixed clinical track was renamed in the 2012 policy as the Academic Clinician track.

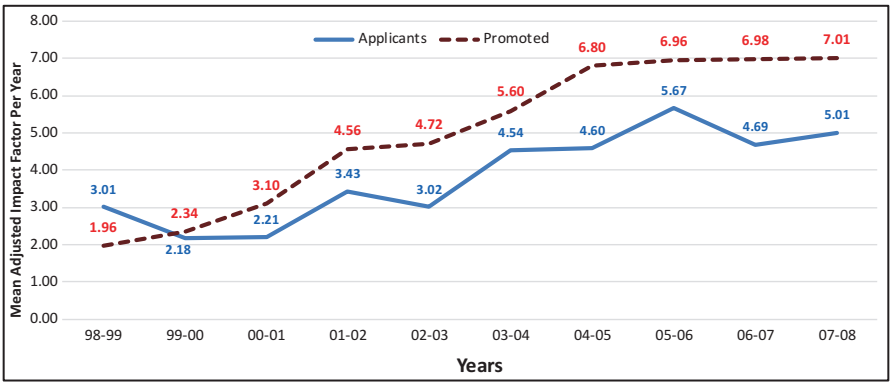



**Fig. 7** Research productivity of all *candidates in the Basic Science Departments*. The mean "adjusted" IF per year on the vertical axis is shown as a function of time in years on the horizontal axis. The dashed line connects the mean "adjusted" IF for all *promoted* candidates for each year. The solid dark line connects the mean "adjusted" IF for *all candidates* for each year

and 6. The data collected from the pooled basic science departments with appointments in one track, shown in Fig. 7 demonstrate significantly less "wavy" curve lines, especially for promoted candidates. This group had a head start because of earlier adequate funding and the availability of the core facility as of 1997.

"Adjusted" IF data were analyzed for associate professors and professors independently and as shown in Fig. 8, for all applicants, and Fig. 9, for promoted applicants; the "peaks" and "troughs" were much larger for professors than associate professors. This is not surprising since assistant professors ready for promotion to the rank of associate professor as of 2002 onward were appointed, as of 1995, with the idea to rejuvenate the faculty and were selected with equivalent criteria and standards, in contrast to those recruited during the war period, some were excellent and some were recruited because of need. The former, more homogenous group had higher publications rates than their predecessors as summarized in Sect. 3.4 [23]. The candidates to the rank of professor were from a more heterogeneous group that included fresh recruits and other candidates who have been in rank for 11 years and prior to that, heavily involved in practice and teaching during the war years. Both Figures clearly exhibit the positive trend line in gradually increasing candidate's mean "adjusted" IFs over time (Fig. 9).

## *4.2 Impact of Gradually Increasing the Bar for "Adjusted" IF on Promotion Rate*

The trend line for "adjusted" IF increased with time, but as shown in Table 9, without altering the rate of success, with the rates of promotion for associate professors, professors, and overall success, fluctuating randomly around means of 73–77%, indicating that there was an increase in overall research productivity rather than weeding out a larger number of candidates with lower productivity.

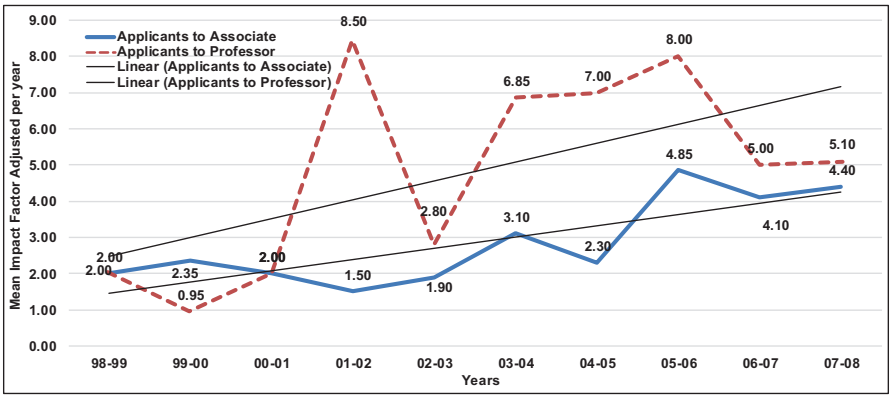



**Fig. 8** Mean "adjusted" IF Per Year for *applicants* for promotion. The mean "adjusted" IF per year on the vertical axis is shown as a function of time in years on the horizontal axis. The dashed line connects the mean adjusted impact factor *for all applicants* to the rank of Professor for each year. The solid dark line connects the mean "adjusted" IF for *all applicants* for promotion to the rank of Associate Professors for each year. The trendlines, obtained by linear regression, are drawn for each category

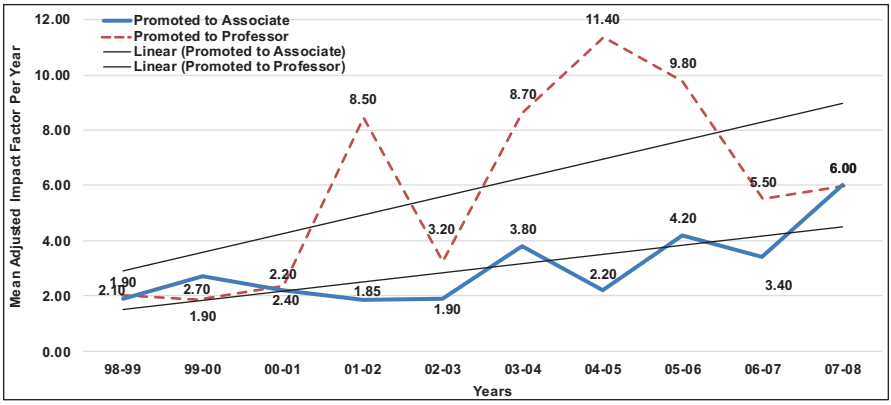



**Fig. 9** Mean 'adjusted' IF Per Year for *promoted* candidates. The mean "adjusted" IF per year on the vertical axis is shown as a function of time in years on the horizontal axis. The dashed line connects the mean "adjusted" IF for all promoted candidates to the rank of Professor for each year. The solid dark line connects the mean "adjusted" IF for all *promoted* candidates to the rank of Associate Professors for each year. The trendlines, obtained by linear regression, are drawn for each category

## 5 Faculty Effort Analysis

Faculty effort analysis was performed as described in Sect. 2.6; the results for 2007–2008 are summarized in Tables 10 and 11.

The data for each department shown in Table 10 reveal that for the basic sciences, the greatest variance is found in the proportion of time spent per faculty member in

**Table 9 Promotion** *success rate*. In each year from 1998 to 2008, the figures on the left in each column indicate the total number of promoted or declined in both of the two ranks. The numbers on the right indicates those promoted or declined to either Associate Professor or Professor

| Promotion success rate | 1998–1999 | 1999–2000 | 2000–2001 | 2001–2002 | 2002–2003 | 2003–2004 | 2004–2005 | 2005–2006 | 2006–2007 | 2007–2008 | 2008–2009 | Overall |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total applicants | **15** | **23** | **20** | **15** | **13** | **10** | **15** | **10** | **14** | **14** | **4** | |
| Promoted | **8** | **16** | **17** | **11** | **10** | **8** | **8** | **8** | **13** | **9** | **4** | |
| To rank of Asso Prof | 7 | 15 | 11 | 6 | 4 | 5 | 4 | 5 | 2 | 3 | 3 | |
| To rank of Prof | 1 | 1 | 6 | 5 | 6 | 3 | 4 | 3 | 9 | 6 | 1 | |
| Declined | **7** | **7** | **3** | **4** | **3** | **2** | **7** | **2** | **1** | **5** | **0** | |
| To rank of Asso Prof | 7 | 5 | 0 | 0 | 1 | 1 | 4 | 1 | 1 | 2 | 0 | |
| To rank of Prof | 0 | 2 | 3 | 4 | 2 | 1 | 3 | 1 | 0 | 3 | 0 | |
| Success rate to Associate Professor | **50%** | **75%** | **100%** | **100%** | **80%** | **83%** | **50%** | **83%** | **67%** | **60%** | **100%** | **77%** |
| Success rate to Professor | **100%** | **33%** | **67%** | **56%** | **75%** | **75%** | **57%** | **75%** | **100%** | **67%** | **100%** | **73%** |
| Overall success rate | **53%** | **70%** | **85%** | **73%** | **77%** | **80%** | **53%** | **80%** | **93%** | **64%** | **100%** | **75%** |

**Table 10** Mean percent effort of faculty members of each academic department in teaching, research, academic, and clinical administration, clinical service, and clinical training for 2007–2008

| Academic Departments | 2007–2008 | | | | | |
|---|---|---|---|---|---|---|
| | Teaching | Research | Academic administration | Clinical administration | Clinical service | Clinical training |
| Biochemistry | 37% | 46% | 16% | 0% | 0% | 0% |
| Human Morphology | 46% | 43% | 9% | 0% | 1% | 1% |
| Microbiology & Immunology | 28% | 55% | 17% | 0% | 0% | 0% |
| Pharmacology | 31% | 40% | 27% | 2% | 0% | 0% |
| Physiology | 30% | 62% | 8% | 0% | 0% | 0% |
| **Basic Departments** | **34%** | **49%** | **17%** | **0%** | **0%** | **0%** |
| Anesthesiology | 15% | 6% | 2% | 6% | 56% | 17% |
| Dermatology | 6% | 5% | 3% | 1% | 62% | 24% |
| Diagnostic radiology | 9% | 8% | 1% | 3% | 38% | 41% |
| Emergency medicine | 8% | 5% | 5% | 16% | 48% | 18% |
| Family Medicine | 8% | 5% | 4% | 4% | 70% | 9% |
| Internal Medicine | 16% | 10% | 6% | 6% | 44% | 18% |
| Obstetrics & Gynecology | 14% | 10% | 4% | 2% | 53% | 17% |
| Ophthalmology | 16% | 5% | 2% | 3% | 56% | 18% |
| Otolaryngology | 11% | 13% | 6% | 3% | 41% | 26% |
| Pathology & Lab. Med | 22% | 13% | 5% | 11% | 40% | 9% |
| Pediatrics | 15% | 10% | 6% | 3% | 41% | 25% |
| Psychiatry | NA | | | | | |
| Surgery | 6% | 5% | 3% | 5% | 57% | 26% |
| **Clinical Departments** | **12%** | **8%** | **5%** | **5%** | **50%** | **20%** |

academic administration, this includes administrative functions of the chairperson and time of faculty spent in the various academic committees of the department, Faculty, and the University. The higher percentages occurred in the smaller departments, no other reason was found for this variance. Total number of faculty members in the basic science departments at the FM ranged between 17 and 20 Full-Time Equivalents (FTEs),[14] with a mean of five per basic science department and a range of 3–8, these numbers are much smaller than counterparts in the USA. Normalizing

[14] Full Time Equivalent (FTE) is full-time effort given for a defined function e.g. if three faculty members give 40%, 25% and 35% effort respectively for a function e.g. research, the three will constitute one FTE of research.

**Table 11** Upper 3 rows show the total number of hours spent in teaching, research, academic administration, clinical administration, and clinical teaching/training, as reported by faculty members in basic science departments, clinical departments and total of both. The lower 3 rows show the % time spent in each

| Department type | Teaching | Research | Academic administration | Clinical administration | Clinical service | Clinical training | Total hours |
|---|---|---|---|---|---|---|---|
| Basic Departments | 12,865 | 18,756 | 6314 | 135 | 96 | 62 | 38,228 |
| Clinical Departments | 53,232 | 40,645 | 22,541 | 25,134 | 253,519 | 99,583 | 494,654 |
| Total | 66,097 | 59,401 | 28,855 | 25,269 | 253,615 | 99,645 | 532,882 |
| Basic Departments | 34% | 49% | 17% | 0% | 0% | 0% | 100% |
| Clinical Departments | 11% | 8% | 5% | 5% | 51% | 20% | 100% |
| Weighted Average | 12% | 11% | 5% | 5% | 48% | 19% | 100% |

the weighted administrative effort of 17% to the benchmarked norm of approximately 5–7% yields the need for at least 49 (or 50) faculty full-time equivalents (FTEs) i.e. 10 FTEs/department for optimal administrative efficiency. This means that the current total administrative effort spent by basic science departments, which is 3.5 FTEs (17% of 20 FTEs) is adequate, by the norm of 7%, for 50 FTEs. Improving efficiency by hiring more basic scientists is not feasible for lack of need, resources, and space. Amalgamating the basic science departments to one academic unit, as an alternative, will require the same administrative effort of one department and, therefore, will relieve the current administrative effort by two FTEs that will become available for teaching and research. This provides an example of how metric analysis is important to right size and then grow by plan. In fact, an Academic Review Team,[15] invited by AUB's President John Waterbury in 1999, chaired by Paul Griner and included Nobel Prize laureate Torsten Wiesel, recommended in their report, amalgamating the basic science departments at the FM to one or two academic units for the purpose of creating more efficient critical masses.

Faculty Effort is reported in the upper 3 rows of Table 11, in hours spent by members of clinical departments, basic science departments, and the weighted average of both. The behavior of the larger clinical departments is within the spectrum of the benchmarked norm. The total number of reported hours spent in curricular teaching and in clinical training is 165,742 h, the mean number of hours per FTE per year at work was 1800 h (1680–2400), which translates to 92 FTEs per year. Teaching of the undergraduate medical curriculum, both basic and clinical, including

[15]The Academic Review Team included. Paul Griner, M.D., Chair, J. Robert Buchanan, M.D. Ramsey Cotran, M.D. Linda Lewis, M.D. George Thibault, M.D. Torsten Wiesel, M.D. Their Report submitted to AUB in 1999 also describes the Research Core Facilities at the FM as "state of the Art."

a relatively small MS program with a number of courses overlapping with medicine, requires 60 FTEs. This number agrees with the FTE requirement calculated independently from the number of credits taught, class sections, and teaching hours currently given. The remaining 32 FTEs cover all residency and fellowship programs. Residency and fellowship training is symbiotic for the mentor and trainee, both benefitting, and hence, there is no mentor compensation.

The same analysis for clinical administration reveals that the reported total number of hours per year spent on clinical administration by chairpersons, heads of divisions, and all other faculty members on clinical departmental, medical board, hospital, and ad-hoc committees is 25,269 h, which translates into 15 FTEs. This is in addition to the clinical administration efforts of those who did not participate in the faculty-effort-analysis process since their roles are purely administrative and include: the Dean/VP (0.6 FTE), Chief Medical Officer (1 FTE), Chief of Staff (1 FTE), administrative positions in the Department of Anesthesiology (0.84 FTE), Laboratory Medicine (0.78 FTE), and Diagnostic Radiology (0.47 FTE), making the total 19.65. This is in agreement with the projections of 21 FTEs for a 425-bed hospital made by the Joint Commission Worldwide Consultants in their report for AUBMC.[16] Similarly, research effort is equivalent to 33 FTEs, 11 of which in basic sciences. The reported effort of FTEs in patient care (clinical service) is 140 FTEs.

All this information is presented to illustrate the importance of starting with strategic faculty recruitment to effect sustainable growth and engage in mission-based growth and budgeting. As per FM/AUBMC mission, the medical undergraduate education enterprise is not likely to grow much and the 60 FTEs, allocated to the FM budget are expected to increase marginally, so are the 21 clinical administrative FTEs at the AUBMC. On the other hand, the net 140 FTEs for patient care may increase significantly by two to threefold as per the mission and vision for clinical service and training. Each mission will therefore grow at its pace without encumbering the others. Mission-Based budgets with 5–10 year plans for education, research, hospital services and professional care were built independently. Education FTEs are allocated to the FM budget, clinical training and service FTEs to the hospital budget, patient care professional FTEs to the Medical Practice Plan (MPP) budget, and research, internally to the stakeholders, through the University Research Fund (URB), Dean's research fund, and the Dean's MPP Fund while the hospital, through the Chief of Staff office, paid for research aimed at performance improvement. External funding is competitive and grew substantially (Table 8). The mean $ 472,120 internal funding available/year (2004–2008) increased from $328,000 in 1998–2001, supports significantly on average 16 bench/ground projects and the mean $ 1,294,826/year of solicited external funding, increased from $234,406 in (1998–2001) supports 44 bench/ground projects.

Faculty members were recruited primarily from the USA from 1997 to 2009 and hence remuneration was based on the published AAMC tables for salaries in the

[16] The Joint Commission Worldwide and Health Care Consultants, USA, were invited by President John Waterbury in 1998 to review the AUBMC, and concluded their work by an extensive report entitled "AUBMC, Strategic and Operational Assessment".

USA, adjusted to differences of taxes in the US and Lebanon. The departmental percentile standing was determined and take-home pay was established from published ratios between ranks. The floor income consisted of allocations to education, research, academic administration (FM budget), and clinical administration (AUBMC budget). Professional patient care income was distributed as per MPP. The process resulted in planned recruitment of 110 faculty members, on average, 10–12 faculty members per year, driven by the growth of the MPP and for whom the facility and infrastructure is prepared. The critical mass for PhD mentors was achieved, setting the stage for unfreezing the program few years down the line.

The quality of the process from 2000 to 2009 resulted in the following recognitions: Accreditation of the programs of the FM and the School of Nursing (SoN) by the Middle States Association of Colleges & Schools (USA), and also for the SoN, accreditation by the Committee on Collegiate Nursing Education (CCNE) of the American Association of Colleges of Nursing. For AUBMC, accreditation by the Joint Commission International (JCI), by the College of American Pathologists (CAP), and for the nursing service, the prestigious Magnet designation.

## 6 Conclusion

This chapter relates the journey of re-establishing post war, an institutional research enterprise at the FM/AUBMC of the American University of Beirut. The plethora of universities that emerged in the Arab world as of the 1990s may have similar challenges as that of post-war AUB. A clear vision and mission for education, research, and patient care guided the process. The environment for research and research funding is different in developing countries compared with developed countries such as the USA and west Europe. A formal peer-evaluation process needs to be established. Bibliometric indicators were introduced starting with the investigator's citation index as of 1955 and the methodology was applied later to journals, as in the journal IF. Citation analysis (14–19) identified groupings, each with its peculiarities that work within various disciplines. Application of the journal IF to institutions was limited by size dependency. Mathematical manipulation to attenuate this variable resulted in the introduction of the Impact Index [25]. To include the impact of both, the number of publications and citations together, the H-index was introduced [21]; it proved significantly predictive for research assessment and success of individual investigators. A number of H-index variants were introduced [22] to attenuate limitations for specified circumstances. The Journal IF, and later the H-index, rapidly gained popularity and importance, particularly in Europe. It became an essential tool to assess, stimulate research productivity and at the same time, guide decisions in allocating research funds, improve performance, and perform benchmarking with similar institutions locally and across the globe. The "adjusted" IF, introduced at FM/AUBMC in 1999, takes into consideration the type of article (s) published and position of author (see Sect. 2.2) and correlates well with the H-index (Table 6).

A database from which the faculty research profile (Fig. 2) is automatically generated was developed that includes: the number of papers, percent of articles not cited, the total number of citations for each investigator, the average citations per paper, percentile ranking of each journal within its discipline, impact factor ("crude" IF), "adjusted IF, impact index, and H-index. These were also expressed per year and per article. The research, teaching, and clinical workload profiles can be seen at a glance. The evaluator can hence concentrate on content, thought process, focus, relevance, and feasibility of the investigator's work. This markedly enhanced external peer-review evaluations. Targets of performance including bibliometric indicators incentivized investigators, particularly when resources are made available.

The availability of adequate funding, research facilities, research infrastructure, and the inclusion of bibliometric indicators in assessing research productivity, and in promotion, resulted in a quantitative and qualitative shift in research productivity as shown in Fig. 3. The number of articles published from 1998 to 2008, as per Scopus, increased by 4.7-fold. The number of articles per faculty per year increased by fourfold. This was sustained beyond 2008, albeit by a 2.0-fold increase in publications and a 1.5-fold increase in the number of articles per faculty member by 2017. The quality of publications, gaged by a basket of bibliometric indicators also improved, particularly among those recruited after 1995. This enhanced the competitiveness of investigators at the FM/AUBMC, increasing extramural funding by about 5.5-fold between 1998 and 2008 (Table 8) and reversing the ratio of external to internal funding from 0.7 in 1998–2001 to 2.7 in 2004–2008. Available funding for conference travel encouraged investigators to present at international meetings and become recognized within the networks of their discipline. This gave more visibility to AUB.

The realistic and transparent targets for research, established for appointment and promotion improved the quantity and quality of research at the time of promotion without decreasing the success rate. The number of faculty members that would qualify and are likely to get long-term contracts (tenure after 2017 at AUB) or tenure appointments in peer institutions increased.

In benchmarking with similar data for 123 medical schools that are members of the American Association of Medical colleges (AAMC), obtained from 1997 to 2007 [24], the FM/AUBMC fits within the distributions of all the size-independent parameters reported for the USA schools.

Effort analysis provided data that markedly enhanced the process of Mission Based Budgeting and Management. A strategic faculty recruitment plan was critical for success at FM/AUBMC. Chung et al. [26] reports the same for a surgery department.

Applying a basket of bibliometric measures provides an overview of research at the FM, departments and by individual investigators. This data are now easy to obtain from web based databases, with literature comparing these databases [27, 28].

Bibliometric analysis strongly complements but does not replace current peer-review methodology in research assessment. It significantly improves decision-making for research funding, space distribution, and planning. It facilitates benchmarking internally and externally and strongly catalyzes development of a peer-review process in developing countries.

**Acknowledgements** The authors acknowledge Mariam Sabah and Rana Bachir for their help in literature review and statistical analysis. Aida Farha and Lockman Meho for help with the ISI web of Science and Scopus databases.

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# Quality-Assurance Agencies in the Maghreb Countries: Challenges and Opportunities


**Wail Benjelloun**

**Abstract** The recent creation of quality-assurance (QA) agencies for higher education in Morocco, Algeria, and Tunisia is an encouraging initiative that is meant to improve the level of university governance and programs in these countries and to align their quality-assurance policies with those in effect in neighboring European universities. Previously, QA was limited to individual university initiatives, frequently undertaken within the framework of cooperation with external partners. Faced with a relentless « massification » of the demand for higher education (HE), North African countries have moved hesitantly towards diversifying their HE offers, encouraging private and semi-private universities as well as public-private formulas that have thus far not really managed to alleviate the situation by serving a significant portion of students. In order to ensure quality levels in public higher education and to regulate the new non-public initiatives, the new QA agencies need to develop an environment favoring transparent evaluation in accordance with well-developed sets of regulations. Yet the initial mandates of these agencies place them squarely under government surveillance, in contrast with regulations in effect for similar agencies in other regions of the world. The opportunities and challenges facing these agencies are considered.

**Keywords** Quality assurance agencies · Maghreb · University governance · Autonomy · Transparency

## 1 Introduction

The Arabic term Maghreb denotes the West, and has historically been used to refer to the western Arab countries, Morocco, Algeria and Tunisia. Morocco was also referred to Al Maghreb Al Aqsa, the « furthest west ». When Mauretania gained

W. Benjelloun (✉)
Mundiapolis University, Casablanca, Morocco

UNIMED Mediterranean Universities Union, Rome, Italy
e-mail: wbenjelloun@gmail.com



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_16

independence in 1960 it was also included in the geopolitical Maghreb and, with the launch of the Maghreb Arab Union in 1989, Libya became part of the Greater Maghreb, thus leaving out only Egypt. The current population of the Greater Maghreb is 100 million, with a little over 3 million university students [1].

The three Maghreb countries inherited embryonic higher-education (HE) institutes which they transformed into universities and, as their populations grew, into HE systems comprising multiple universities and essentially based on the French model. Morocco (900,000 students) adopted the Barcelona process Bachelor-Master-Doctorate (LMD) in 2003. Tunisia (250,000 students), then Algeria (1.6 million students), soon followed suit. Mauritania (24,000 students), on the other hand, did not create the University of Nouakchott, also on the French model, until 1981 with the merger of two faculties and started integration into the LMD process in 2009 (Mohammed V University of Rabat accompanied this operation at the Faculty of Humanities and Letters). The 13 Libyan universities, with 270,000 students, suffered from the effects of the US embargo during the Gaddafi years as well as from the 2011 uprising which led to his downfall. Many were closed for extended periods of time and their challenges range from lack of competent faculty to lack of material resources and to inept governance [2].

Quality assurance (QA) has presented a standing challenge to the Maghreb universities since the 1990s. The last decade of the twentieth century was marked by an increasing demand for university access, creating pressures on the governments of the region to rapidly expand public university education while attempting to maintain acceptable levels of quality. During the past three decades this « massification » has constituted the major challenge facing the HE authorities and universities of the region.

Algeria, Morocco, and Tunisia attained independence with embryonic HE institutes left behind by the the colonial power, France. Early on, all three countries established national public universities which contributed to the training of the national administrative competencies needed to face the requirements of a modern state. In spite of the difficulties of the transition to independence, the Maghreb universities generally enjoyed good regional reputations which extended to Europe. National secondary-level baccalaureate certificates gave access to the European universities and national university diplomas were recognized as giving access to the subsequent cycles [3].

This relationship with European universities and the resulting cooperative frameworks were established through the exchange of French and other « coopérants » in the scientific fields, followed by European Commission university cooperation programs, such as MED-CAMPUS, Tempus, Erasmus, Erasmus+, and Horizon 20-20. The early MED-CAMPUS program for example was launched in 1992, involving 245 European Community universities and 209 universities in non-European partner countries, of which 84 were in Morocco, Algeria, and Tunisia [4]. In addition to their own concern with quality in HE, this priviledged relationship with European universities, coupled with adoption of the Bologna process LMD sequence, constituted an added impetus towards quality enhancement in Maghreb higher education.

Massification has also pushed North African countries to move with varying degrees of determination towards diversifying their HE offers, recognizing that public HE cannot alone meet the needs of a growing university-age population. They have encouraged private and semi-private universities as well as public-private and public-public formulas that have thus far not really managed to alleviate the situation by serving a significant portion of students. Faced with the need to ensure quality levels in public HE and to regulate new non-public initiatives, the new QA agencies need to develop an environment favoring transparent evaluation in accordance with well-developed sets of regulations.

Although all three countries have made commitments to the creation of QA agencies, only Morocco and Tunisia have in fact advanced to establish regulatory frameworks leading to the launch of the agencies and the start of evaluation, accreditation, and training functions. Algeria is expected to launch and operationalize its own agency imminently, having relied so far on regional initiatives by university consortia, under the supervision of a national commission.

## 2 Tunisia

The Tunisian QA framework was established with the objectives of encouraging a culture of quality within HE institutions, implementing a national quality-enhancement program, and fostering the expertise necessary for HE evaluation and quality [5]. This decree constituted a legal framework providing for the establishment of an active National Authority for Evaluation, Quality Assurance and Accreditation by 2011. A complementary decree [6] designated the agency as a contractual partner for universities with two functional roles: a quality-enhancement responsibility and an evaluation, accreditation, and referentials function. It operates under the supervision of the ministry in charge of higher education.

In confirmation of the anchoring of North African HE to international referentials, the Tunisian QA program sets its own quantitiative references, and the Tunisian National strategy for HE has adopted qualitative objectives aimed at attaining the standards of OECD countries. Quality of HE has thus become a principal focus in Tunisian HE, scientific research, and technology policy [7].

Tunisian universities were encouraged to establish Quality committees to follow the quality of academic programs at Bachelor, Master, and Doctoral levels to improve teaching methodology, curricula, infrastructure, and equipment, as well as to render financial and administrative management more efficient. Competitive access to financial encouragement was made available to support this initiative. These committees are in charge of elaborating internal evaluation reports, monitoring the established programs in particular those related to quality, and formulating proposals regarding quality enhancement. Until September 2009, the national HE system included 162 committees within institutions, with 1200 members, of which 300 were representatives of socio-economic partners. QA activities were centralized in each university under the supervision of a QA committee. The participation

of socio-economic partners was meant to facilitate university relevance and to improve employment prospects of graduates through the setting up of business incubators and business hubs.

The financial sustainability of the Tunisian quality-enhancement program in HE remains highly dependent on the competitive funds managed by the Ministry of Higher Education, Scientific Research and Technology, which apportions funding to universities on the basis of a contractual process. This contract-based approach was meant to bolster decision-making autonomy and to reinforce universities' capacity to negotiate objectives, and to closely monitor outcomes through the use of well-defined indicators.

The Tunisian National strategy in HE additionally laid down a number of qualitative objectives aimed at reaching the standards of OECD countries. Quality in HE thus became a principal concern of national policy.

The early years of the quality-enhancement activities of the Tunisian agency focused on management-capacity enhancement, institutional accountability, better use of public funds, and reinforcing competitiveness for employability. Under its evaluation mandate, the agency has sponsored the training of 120 experts through its own programs and through cooperation with European partners.

Thus, the apparent contradiction between « decisional autonomy » and « financial dependence », which generally characterizes university function in the Maghreb countries, has now also been incorporated into the legal framework governing the Tunisian QA agency. The decree of 2008 in fact allowed universities to switch their legal status from the general case of « public institutions » to the specific « public institutions of scientific and technological nature » if they complied with financial, budgetary, and managerial requirements. This specific legal framework is similar to the French legislation and allows universities more administrative and financial flexibility and autonomy. Thus far, only the Virtual University of Tunis has met the stringent criteria established for such status.

## 3 Morocco

The Moroccan situation is not very different. The Moroccan Agency was established by Royal decree n° 1-14-130 of 31 July 2014, based on Law 80-12, as applied through decree n° 2.15.813 of 28 September 2015 [8]. The National Agency for Evaluation and Quality Assurance (ANEAQ) is placed under the authority of the government department in charge of HE and scientific research and is subject to the regulations and prerogatives of the Minister of Economy and Finance relative to the operation of public institutions.

The Agency is charged with evaluating the HE and scientific research system, with the aim of guaranteeing quality. It thus evaluates both public and private universities and institutes, as well as research centers, with reference to their specific missions and scientific projects. It undertakes the assessment and accreditation of undergraduate and Master-level educational tracks as well as the evaluation of

Doctoral schools to determine the quality of training programs and research work undertaken under their supervision. The Agency also evaluates work undertaken at national research centers and programs conducted within the framework of national and international cooperative programs.

In addition to its mission of quality enhancement in the HE sphere, the Agency may be solicited to undertake specific missions for Universities or for other ministries that operate educational or research facilities or for departments such as the Higher Council for Education, Training and Scientific Research and the Hassan II Academy for Scientific and Technical Research. These prerogatives give the Agency potentially interesting territorial reach within the national regionalization program [9].

The Agency may also be mandated to undertake quality-enhancement evaluations for foreign organisations, within the framework of cooperation agreements with the government of Morocco.

ANEAQ is under the supervision of an Administrative Council presided by the Head of Government and composed of two representatives of the Ministry of Higher Education alongside 12 other members, including representatives of other government agencies, past presidents and presidents of public universities, and an elected staff member of the Agency. The Administrative Council has wide powers in managing the Agency affairs including budget allocation, services, and internal regulations. The Agency went into full gear during the 2017–2018 academic year, evaluating the curriculum accreditation and reaccreditation files of all public and private universities and institutes.

The sustainability of the Moroccan system has been assured through government salaries for ANEAQ employees and the payment of evaluation fees for each track submitted, with accreditation valid for 3 years for Bachelor-level tracks and for 2 years in the case of Master-level tracks. A select number of faculty serve as experts in these operations. Until the creation of ANEAQ there was no reliable mechanism to compensate faculty who served as accreditation experts. The special status of ANEAQ has now facilitated this process.

## 4 Algeria

Algeria has taken a more gradual approach to QA. The Ministry of Higher Education and Scientific Research established a National Commission for the Implementation of Quality Assurance in Higher Education (CIAQES) on 31 May 2010, whose approach seems more decentralized and more oriented towards internal evaluation within each university. The Commission has also sponsored QA campaigns that involve several universities organized as consortia. In much of its work the commission relies on and builds upon the work of university quality committees [10, 11].

The Commission's mission is the establishment of QA cells in universities and HE institutes, the training of QA managers, the definition of a national quality referential and, finally, the creation of a national QA agency.

The process has been rather slow and progress uneven. Not all universities have managed to set up functional QA cells and this may be due to the fact that not all have developed at the same pace. In 2017, the Ministry of Higher Education and Scientific Research launched an operation to generalize internal evaluation in all Algerian universities in preparation for the launch of a full-fledged QA program.

CIAQES itself has known rather irregular progress. A new roadmap was recently announced providing for the training of QA experts, the reactivation of QA units, the launch of self-evaluations for eligible sites, preparation for the launch of a QA agency, publication of a national referential manual, and coordination of all QA programs involving European and other international partners. CIAQES has also committed to better communication with universities and the public concerning its activities through a new website and newsletter.

In terms of financial and administrative sustainability, CIAQES has the status of a scientific society attached to the Secretary General of the Ministry of Higher Education and Scientific Research, and is thus under ministry supervision and dependent on its funding.

## 5 Mauritania and Libya

Both Mauritania and Lybia are relative newcomers to the QA issue in higher education. Although Libya has a Ministry department under the denomination Center for Quality Assurance and Accreditation, its main function has been to oversee the licensing of new universities since the modification of the Higher Education Law in 2010 [2]. In Mauritania, a new QA agency was established in 2016 to ensure quality in the curricula and governance in HE [12] but it has yet to significantly impact the Mauritanian university system.

## 6 Opportunities

QA systems make it possible to evaluate the quality of service provided by the HE institutions and the approaches vary according to national context and stated objectives. Whatever the options, these systems have common features (preset and transparent standards, procedures combining self-evaluation and external evaluation, publication of evaluation results, etc.) which allow, ultimately, a mutual recognition of systems and, eventually, their interaction in regional frameworks. All three countries recognize that QA in HE is a key contributing factor to national socio-economic development.

A QA program provides appropriate information about the institution and its activities (accountability) and specifies the strategies adopted to improve the quality of its functions (enhancement) [13]. The HE practitioners and authorities in both Morocco and Tunisia seem to have integrated this principle in their QA programs.

This has introduced a new dimension in the HE sphere, with the concept of evaluation becoming more widely accepted, progressively adding value to both educational programs and research. In both countries, QA has led to healthy competition between the public universities as they strive to internalize and institutionalize the required procedures, thus increasing their attractiveness and ability to generate funds. The process has also impacted the private sector where universities are now dealing with a more transparent system, in spite of multiple growing pains. Algeria seems set to embark on the same road; the intermediate phase of a national commission preceding the launch of a QA agency seems to have cost it precious time and not to have really advanced the process.

Importantly, all five Maghreb countries recognize the need for QAmechanisms and have aligned themselves with the international trends in this domain. It would seem that there are opportunities for collaboration between all five countries to to attain some common referentials and, perhaps, a common QA agency for the Maghreb universities.

## 7 Challenges

The major challenge facing Maghreb universities in the area of QA is ensuring the sustainability of these activities and building upon past experiences, thus rendering QA an integral part of HE systems.

This challenge may be overcome through capacity-building; the training of expert evaluators and the standardization of procedures continue to be urgent priorities to face the demand. The evaluation process for accreditation of specialty tracks or of universities is a labor-intensive one requiring properly trained personnel. HE authorities in all five countries recognize the need to continue to train administrative personnel and faculty to ensure that quality is properly developed and assessed. This can be seen through the participation of their universities in the various projects funded in this domain by international organizations.

The relationship with Europe has been particularly beneficial [14]. Several universities in Morocco have been involved in quality assessment since 2002, when the Bologna LMD system was adopted. A good example is Mohammed V University, which published its first internal evaluation in 2006, inspired by Law 01.00 for the modernisation of the Moroccan University system. Yet even prior to this initiative, the selection and promotion of faculty required criteria to assess the quality of their contributions. Through its participation with 16 other Arab universities in the UNDP EQUAIP project (2002–2008) designed to encourage quality assessment in the region, Mohammed V University acquired expertise through training of its faculty. Other collaborative projects led to the training of additional experts: Ev-Qua MEDA (institutional evaluation of engineering programs, 2003–2005), Tempus FOREVAL (2005–2006), in addition to the cooperative program with Indiana State University, which trained experts and set the stage for a national referential for quality assessment in 2008. Other programs led to the training of teachers and administrators

(Tempus Eval-UM5A, 2005–2007) and to the establishment of a QA unit. Such intensive QA activity, with periodic internal and external evaluations, was characteristic of several Moroccan universities and encouraged the development and generalization of a culture of quality assessment and enhancement. At present, several public and private universities participate in EQUAM-M, an Erasmus+ project with ENQA and the University of Barcelona on enhancing QA management in Morocco, as part of the KA2 program "Capacity building in the field of higher education".

Similartly, Tunisian and Algerian universities have also built bridges with Europe through EC projects such the Tempus project Aqi-UMED, in which the University of Tunis participated alongside other Maghreb universities, with Universities and agencies from France and Belgium. As the Libyan universities restructure, they have also participated in UNIMED (Mediterranean Universities Union)-led European projects.

## 8 Conclusions

All five Maghreb countries recognize the need for QA mechanisms and have aligned themselves with the international trends in this domain. In and of itself, this is a positive development and should lead to progress in program quality and enhancement over the next few years, improving the international competitivity of Maghreb universities and rendering them more attractive in international partnerships. The close association with European universities through Commission programs (Tempus, Erasmus+, Horizon 2020) and international organizations (UNDP, World Bank, OECD) has facilitated the initial phases of the QA process. Continuing association with the European Union will favor the further development of QA activities in the Maghreb region but, perhaps more importantly, Maghreb QA agencies also need to share experiences between themselves in a concerted regional effort to face HE challenges.

Over the past few decades and thanks to the QA effort, the idea of evaluation has made headway in Maghreb universities (programs, faculty, governance) and this effort must be reinforced. To be credible, these evaluations should involve all university stakeholders (students, peers, administration, partners), be transparent and presented as fostering improvement. Once again, the leadership and expertise of the QA agencies will be needed to ensure regular progress on these fronts.

QA will no doubt impact governance, through the fostering of transparency, efficiency, and a more institutionalzed approach. As the QA agencies become fully operational, universities' ability to ensure responsible governance will also improve, encouraging the Maghreb governments to grant them more institutional autonomy, both administratively and financially, an objective recently stressed by the new Moroccan minister of Higher Education [15]. Such autonomy is in turn likely to alleviate the weight of HE spending in the region's national budgets, freeing up funds badly needed in other sectors.

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# Introducing Quality Assurance in Algerian Higher Education: The Case of the University of Science and Technology Houari Boumediene


**Ahmed Guessoum**

**Abstract** During the recent years, the Algerian Ministry of Higher Education (MESRS) has come to the conclusion that there is an acute need for the introduction of Quality Assurance in the entire Algerian Higher Education sector. A national committee was formed to plan for this and prepare a national QA framework to be customised by the various universities and "Grandes Ecoles" in the country according to their own characteristics.

This chapter will start by highlighting the need for QA in the Algerian universities. We will then introduce the efforts spent by the MESRS on setting the ground for the introduction of QA and making it mandatory on all HE institutions in Algeria. The main sections of the national QA framework will then be explained. These are: (1) Teaching; (2) Research; (3) Governance; (4) Infrastructures; (5) Life on Campus; (6) Relations with the Socio-Economic Environment; and (7) International cooperation.

As a case study, we will present the institutional Self Evaluation task force which we have chaired during the Spring Semester of 2017 at the University of Science and Technology Houari Boumediene (USTHB), probably the most important science and technology university in Algeria with 8 sizeable colleges and more than 41,000 students. We will discuss the challenge of organising Self Evaluation for a university of this size and the hurdles met, as well as encouraging promises. Finally, we will highlight the key findings from the Self Evaluation Report as well as some return of experience from the evaluation.

**Keywords** Quality assurance · Higher education · Algeria · QA framework · Institutional QA · Self-evaluation · USTHB

A. Guessoum (✉)
Department of Computer Science, University of Science and Technology Houari Boumediene, Algiers, Algeria
e-mail: aguessoum@usthb.dz



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_17

## 1 Introduction

Quality Assurance (QA) in higher education institutions (HEIs) can be seen as a natural development of all the efforts that were undertaken in the economic sector to improve the quality and efficiency of production and management systems within companies. QAHEI was introduced in the 1980s of the last century and has come a long way since, becoming one of the fundamentals that must be taken into account in the organization of all aspects of modern universities (including a number of Arab countries in the Middle East). In particular, a lot of effort is increasingly spent on institutional evaluation of QA [1].

The Algerian Ministry of Higher Education and Scientific Research (hereafter denoted by MESRS) became aware of the importance of QA in HEIs a number of years ago. This was translated in 2010 into the creation of two committees [2]:

- the National Evaluation Committee (CNE) whose main task is "to evaluate the activities and actions of higher education institutions … in terms of governance, training and research with respect to the objectives that are set for them" and
- the Commission for the Implementation of a National Quality Assurance Framework in Higher Education Institutions (CIAQES) whose main tasks are quality assurance training in higher education, the development of a national QA framework, and the meeting of the conditions for the creation of QA in Algerian HEIs.

The launching of these committees was followed by the creation in each Algerian HEI of a central Quality Assurance Unit, the organization of various trainings for the people in charge of the implementation and follow up of QA (at the HEI level as well as the college level), and so on. Though the project has seen some delays in moving forward to more concrete steps, the Ministry of Higher Education (MESRS) gave a strong signal by deciding that the academic year 2016–2017 would be the year of QA in the HEIs. Thus, in January 2017, a global effort was officially launched getting the various HEIs to make their own self-assessments. This amounted to taking charge of two main tasks: (1) the appropriation of the National QA Framework for HEI (RNAQES defined by the CIAQES) and (2) the self-evaluation per se.

Since USTHB is one of the most important universities in the country, it was important to respond positively to this decision of the MESRS. Thus, as of the 2nd of March 2017, the university Self-Evaluation Committee (SEC) was formed and given the responsibility of the two aforementioned tasks. The SEC, although aware of the enormity of the task in such a short period of time (March to June 2017) and although knowing that the MESRS does not require a self-evaluation of the university in the seven areas covered by the RNAQES,[1] collectively decided to take up the

[1] The seven areas of the National QA Framework are: Teaching, Research, Governance, Infrastructure, Life on Campus, Relations with the Socio-Economic Environment, and International Cooperation. These will be explained in more details below.

challenge of a Self-Evaluation in the seven domains for the sake of contributing to the important effort of improving QA practices at USTHB. As such, more than 40 members of the SEC, divided into seven sub-committees and organized according to a very precise schedule, undertook the heavy responsibility of carrying out the university SE.

The SEC effort was crowned by the writing up of a SE report that had the merit of setting the foundations of SE (which was non-existent before at USTHB) especially at a university of the scale of USTHB. The report came as a result of carrying out the requested SE, and highlighting the strengths and weaknesses of the university, as well as making recommendations for the improvement of at least those aspects that deserve immediate or short-term action.

## 2 Algerian Higher Education Institutions

Although Algeria got its independence in 1962, making it a fairly young country as such, it does have some universities more than 100 years old. It turns out that in 1962, Algeria had one main university: the University of Algiers (the capital) founded in 1910, with two dependent universities in Constantine (East) and Oran (West). It also had some Grandes Écoles such as l'École Nationale Supérieure de Commerce (1900), l'École Nationale Supérieure d'Agronomie (1909), and l'École Nationale Polytechnique (1925) [3]. Today, Algeria has a network of 106 HE institutions spread over the 48 Wilayas (first major administrative divisions in the country) [4].

The student population in occupied Algeria in 1952 consisted of barely 503 students (the large majority of whom were French non-indigenous citizens, i.e. colonisers [5]), growing to 2750 in 1962, the year of independence. After huge efforts put on education at all stages, Algeria witnessed an exponential growth in its student population which reached 1,277,000 (Sep. 2013) and 1,600,000 (Sep. 2017). According to [3], this represented 144 students for every 100,000 inhabitants in 1971, almost 3000 per 100,000 in 2010 and, with an estimated population of 40,969,443 [6], 3905 students per 100,000 in 2017. Algeria has also witnessed an ever larger number of university faculty members of all ranks with a total of 57,513 in Sep. 2016, a growing ratio of which is of those holding a PhD degree. Algeria is today self-sufficient in terms of the coverage by Algerian faculty members of its HEI needs. As a result of this growth in the numbers of HEIs, student population, and faculty members, 293,548 university degrees were awarded in June 2017, bringing the total number of awarded degrees to more than two million since independence [7, 8].

# 3 Quality Assurance in Algerian Higher Education Institutions

## *3.1 Initial Organisational Steps*

As mentioned above, the National Evaluation Committee (CNE) and the Committee for the Implementation of a Quality Assurance System in Higher Education Institutions (CIAQES) were created in 2010 by the Algerian MESRS. Since then the various HEIs have each nominated a Quality Assurance Unit chaired by a RAQ (Responsable Assurance Qualité). The duty of the latter is to organise and oversee the introduction and deployment of QA in his/her HEI. The various HEI RAQs also contributed with the CIAQES in the development in 2014 of the National QA Framework (RNAQES being its acronym in French). Various trainings were then programmed for the members of the various HEI QA units.

## *3.2 The Algerian National QA Framework*

As illustrated in Fig. 1 [9], the National QA Framework is hierarchically structured into Domains, then Fields (champs), then References, Criteria, and Evidence (preuves). It covers all aspects of QA at the institutional level as defined by the CIAQES. These are expressed in terms of seven domains for ***Institutional QA***:

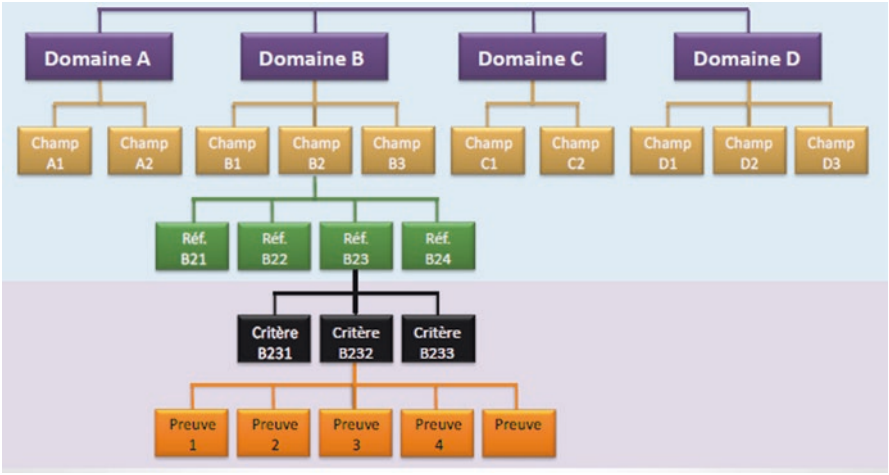


**Fig. 1** Hierarchical structure of the Algerian National QA Framework [9]

- Teaching (Formation, F)
- Research (R)
- Governance (G)
- Life on Campus (Vie à l'université, V)
- Infrastructures (I)
- International Cooperation (C)
- Relations with the Socio-Economic Environment (S)

To check the quality of the coverage of each domain in a given HEI, each domain of the National QA Framework has been subdivided into Fields (champs in French) and each of these fields is to be evaluated according to a number of defined references (indicators). The evaluation of each reference depends on a number of facets called criteria (critères) each of which has to be justified by means of one or more evidences (preuves). Table 1 below gives the numbers of fields, references, criteria and required evidences for each domain. The total number of references of the National QA Framework is 123.

Consider, for instance the « Governance » Domain (G). It consists of the following five fields

- Field G1: Information System
- Field G2: Policy Development Settings
- Field G3: Organisation and management of the units and services
- Field G4: Management of the support functions to serve the various missions
- Field G5: Quality Assurance procedures

If we zoom in on Field G2 (*Policy Development Settings*), we find it defined as follows (the structure of the definitions of fields, criteria, etc., being standard in the QA framework).

**Field G2** (*Policy Development Settings*):
Interpretation: It describes the institution's tools for elaborating policies.

- Reference G21: The institution has an internal organisation to develop concerted policies on teaching, research and governance.
  - Criterion G211: The institution has set up consultation structures.

**Table 1** Number of fields, references, criteria and required evidences for each domain of the Algerian National QA Framework

| Domains | | Fields (champs) | References | Criteria | Evidences (preuves) |
|---|---|---|---|---|---|
| 1 | Teaching (F) | 07 | 23 | 49 | 108 |
| 2 | Research (R) | 03 | 17 | 32 | 55 |
| 3 | Governance (G) | 05 | 27 | 53 | 181 |
| 4 | Life on campus (V) | 04 | 14 | 25 | 71 |
| 5 | Infrastructures (I) | 05 | 17 | 19 | 38 |
| 6 | Intern. cooperation (C) | 03 | 11 | 19 | 40 |
| 7 | Relations with env. (S) | 04 | 14 | 22 | 70 |
| Total | | 31 | 123 | 219 | 563 |

- Reference G22: The institution organizes its internal consultation for the development of its various policies: training, research, and governance
  - Criterion G221: The institution has internal consultation mechanisms for the development of its teaching policies.
  - Criterion G222: The institution has internal consultation mechanisms for the development of its research policies.
  - Criterion G223: The institution has internal consultation mechanisms for the development of its governance policies.
- Reference G23: …… (to Reference G27)

# 4 Self-Evaluation of QA at USTHB

## *4.1 USTHB at a Glance*

The University of Science and Technology Houari Boumediene (USTHB) was born in 1974 as the dream of late president Houari Boumediene to have a University of Sciences and Technology of Algiers that would encompass the different branches of Science and Technology. It can be considered as the historical extension of the Faculty of Sciences (University of Algiers) created in 1910 during the colonial era and closed with the opening of USTHB, this faculty having itself been an extension from the School of Science created in 1868. The University of Science and Technology Algiers (renamed as USTHB in 1980) opened in September 1974.

If the educational project was 43 years ago to have a university of 8000 students (a number that increased to 12,000 soon after), USTHB had as of September 2017 41,121 registered students, of which 29,005 in License (3-year Bachelor degree), 9389 in the Master's programmes and 2727 in the doctoral programmes. For the year 2016–2017 alone, USTHB enrolled in 8000 new students at the Licence level, reaching a total of 13,451 students in the 1st year of Licence (L1).

USTHB covers an area of 140 ha and includes, in addition to the colleges, a central administration block and its annex, an 1800-seat auditorium, 24 lecture halls, 180 classrooms. The total capacity of these infrastructures is of 28,000 teaching places. In addition, one finds the "University Village" for catering and various student activities, a Central Library and one library per college, a Computer Resources Center, and various infrastructures for research laboratories, the maintenance of green spaces, etc.

USTHB is no doubt the most prestigious University of Science and Technology in the country. Its reputation goes beyond the national boundaries. To date, it has produced nearly 100,000 graduates in the various fields of science and technology, including 8401 graduates during the 2015–2016 academic year alone. These graduates contribute in Algeria and throughout the world to the scientific, economic and

social development in multiple fields of activity of the universities, research centers, companies, and other institutions that employ them.

Scientifically, the university is organized into eight colleges (Facultés): Chemistry (FC); Electronics and Computer Science (FEI); Civil Engineering (FGC); Mechanical Engineering and Process Engineering (FGMGP); Mathematics (FM); Physics (FP); Biological Sciences (FSB); and Earth Sciences, Geography and Spatial Planning (FSTGAT). These colleges employ 1863 faculty members. The distribution of the number of students and teachers at USTHB per college (excluding the 13,451 students of the L1 foundation year) for the year 2016–2017 is given in Table 2.

USTHB employs 351 professors and 235 MCAs (Associate Professors) for a ratio of more than 34% for these two categories with respect to the total number of faculty members. This is a very high ratio at the national level. And, to support the management of a university of this size, 1156 ATSs (Agents Techniques et de Services, Technical and Service Agents) work in its various administrative units.

The numbers of students, teacher-researchers, and administrative staff are such that the management of a university of this size is only possible if the university's procedures for the seven RNAQES (National QA Framework) domains are well defined, comprehensive, and actually implemented. The purpose of the self-evaluation was to verify to what extent this is the case.

**Table 2** Number of students (excluding L1) and teachers at USTHB per college in 2016–2017

| College | | Number of students in 2016–2017 | | | | Number of faculty members in 2016–2017 |
|---|---|---|---|---|---|---|
| | | Total number of students (L + M) | L | M | D | |
| FC | **College total** | **1515** | **763** | **752** | **212** | **215** |
| FEI | Computer Science | 1685 | 907 | 778 | 189 | |
| | Electronics | 2933 | 1646 | 1287 | 332 | |
| | **College total** | **4618** | **2553** | **2065** | **521** | **322** |
| FGC | **College total** | **2593** | **1634** | **959** | **146** | **116** |
| FGMGP | Mechanical engineering | 2360 | 1630 | 730 | 191 | |
| | Process engineering | 3065 | 1729 | 1336 | 186 | |
| | **College total** | **5425** | **3359** | **2066** | **377** | **228** |
| FM | **College total** | **1232** | **707** | **525** | **408** | **250** |
| FP | **College total** | **880** | **597** | **283** | **288** | **250** |
| FSB | **College total** | **5623** | **3873** | **1750** | **357** | **314** |
| FSTGAT | **College total** | **3057** | **2068** | **989** | **418** | **168** |
| | **Total** | **38,394** | **15,554** | **9389** | **2727** | **1863** |

### *4.2 Composition of the Self-Evaluation Committee and Definition of the SE Contours*

As mentioned above, USTHB is a very large university with more than 41,000 students (L, M, and D), teachers and administrative and technical staff, eight major faculties, and various administrative and technical services. SE within such a university was from the beginning understood as being a huge task, especially that it was also necessary to customise the National QA Framework (RNAQES) into an Institutional QA Framework (RIAQES of USTHB). All of this had to be done within the pre-set period of 4 months. Thus, a very rigorous organization was needed to overcome this responsibility within the timeframe set by the MESRS. What made the task even more complex is that that this was the first time the university was to undergo a process of self-evaluation. This implied the building of the entire organization ex nihilo.

The Self-Evaluation Committee was installed by the university chancellor on 02/03/2017. This SEC initially consisted of 49 members, divided into 7 Subcommittees, each one responsible for one of the RIAQES domains. Each subcommittee is chaired by a Domain Evaluation Officer, and includes a Domain Pilot, a permanent member of the University's Quality Assurance Unit, and a few evaluation members, including a representative of the ATS, and a student representative (doctoral student). After some losses due to various personal or professional reasons, the SEC continued the running of the task with 43 members.

After two meetings during which the SEC President and the Quality Assurance Manager (RAQ) explained the principle of the SE, the steps to follow and showed how a reference should be defined and eventually marked, the SEC members quickly decided, and despite the challenge that this would present, to make a SE that covers all the seven domains of the RIAQES. Indeed, they were all aware of the importance of the task and chose to make the necessary sacrifices (in time and effort) to help the university save time and collect data and make analyses that would allow it to improve on the seven domains, all in parallel; one domain often having a direct or indirect impact on others.

Nevertheless, the SEC decided that given the time constraints put on this first self-assessment, the modifications to the RNAQES (i.e. customisation into an institutional framework) would be kept to a strict minimum in terms of adding and/or deleting criteria and/or evidence. It would thus be the duty of the USTHB Quality Assurance Unit to work on this in the next version of the RIAQES. In addition, the SEC decided that given the number of colleges and their sizes, the SEC would proceed through a sampling approach. Thus, all colleges were visited but not for each domain of the RIAQES. As a result, each sub-committee responsible for a domain had to visit two to three colleges to cover their references, in addition to the different relevant departments of the central administration. This would allow the SEC members to cross-check the various answers and evidences.

### *4.3 Defining the QA Institutional Framework of USTHB*

A first important task of the SEC was to customise the National framework (RNAQES) into an institutional framework (RIAQES) that would take into account the specifics of USTHB. The definition of the RIAQES included the following:

- Defining all the interviewees on any reference (administrative staff at all levels including the Chancellor, Faculty members, students, etc.);
- Deciding on the relevance of any reference and any criterion for the relevant references;
- Writing down the documents (evidence) that are required for any criterion of any reference; and
- Deciding the weights of the different criteria (in the calculation of the combined marks).

Various spreadsheets need to be created (customised) by injecting the above information. The end result is to prepare spreadsheets as shown in Table 3, one for each Reference of any domain. Table 3 shows the case of Reference F11 (from the Teaching Domain, F, and Field F1). This reference has two criteria (F111 and F112) that need to be checked, the former requiring two evidences that need to be verified and the latter only one. The initial task of the SEC is to fill in such spreadsheets by inserting the titles of the actors that need to be interviewed for the particular reference, and the applicability or not of the Field and of the reference. In case both are applicable, the SEC evaluators (the sub-committee that evaluates the domain of this reference) need to check whether the corresponding criteria and evidences are applied or not, and a mark (Ma) between 0 and 4 is assigned to the evidence. Note that the evaluators also assign a mark of A (weight 4), B (weight 3), or C (weight 2) indicating to what extent the evidence is relevant (A being most relevant). The SEC members also have the possibility to insert comments so that they can eventually discuss their individual findings before finalising the sub-committee's marks.

Based on the marks that get assigned to the various evidences and the weights given to the relevance values, a weighted sum is computed (Mc) for the corresponding criteria, and for the reference, based on the marks of all its criteria. A weighted average for all the criteria of a field yields a computed mark (Mc) for the field, and likewise a weighted average (computed) mark for all the fields of a domain is computed, allowing to come up with a mark for the university coverage of that particular domain. This is repeated for each of the seven domains of the RIAQES. Note that the assigned marks (Ma) for the various Evidence, Criteria, and References also get combined with those assigned for the other references and yield averages of the assigned marks for the various Fields and Domains. Eventually, radar charts are plotted for the various domains as well as within each domain based on the scores for the various fields. One can obviously be as refined as needed in the analysis since the data is available.

**Table 3** Spreadsheet for the evaluation of Reference F11

| Item | Code | Actors | Applicability/application | | Relevance | | | Mark (Ma: assigned; Mc: calculated) | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Yes | No | A | B | C | Ma | Mc | |
| Domain | F | DAEGD | | | | | | 4 | 2.31 | |
| | | DEPTS | | | | | | | | |
| Field | F1 | DAEGD | Yes | | | | | 4 | 2.12 | |
| | | DEPTS | | | | | | | | |
| Reference | F11 | DAEGD | Yes | | | | | 4 | 3.57 | |
| | | DEPTS | | | | | | | | |
| ∑ criteria | | | | | C | | | | | |
| Criterion | F111 | DAEGD | Yes | | B | | | | 3.14 | |
| | | DEPTS | | | | | | | | |
| Evidence | 1 | | Yes | | A | | | 2 | | |
| Evidence | 2 | | Yes | | A | | | 4 | | |
| Criterion | F112 | DAEGD | Yes | | A | | | | 4 | |
| | | DEPTS | | | | | | | | |
| Evidence | 1 | | Yes | | A | | | 4 | | |

## *4.4 Self-Evaluation of USTHB*

The SEC took the SE task as an opportunity to make as accurate an assessment of the University as possible on the different Domains and References. This would allow it to make a set of recommendations based on the results of the SE so as to improve the performance of USTHB. This would in turn get the university ready for the forthcoming external evaluation.

As mentioned above, each of the seven sub-committees was in charge of the definition of the references and the evaluation of a domain. A sub-committee included at least an Expert Evaluator, a member of a college QA unit, a faculty member, an administrative staff, and a doctoral student. A global plan for the visits was designed by the SEC chair and the university RAQ; it included visits to various actors (stakeholders) for the same reference. In total, 200 visits were planned, 86% of which actually took place. The SEC members carried out the visits, taking extensive notes and checking the documents (evidences). A Very good cooperation by the interviewees was observed despite their "worries" that the SE might "harm them". This required a lot of communication work to reassure them.

In parallel with the visits and interviews, the SEC chairman and the RAQ were continuously monitoring the visits and sparingly attending various interviews. The former also programmed the cells in all the spreadsheets of the 123 references and made them available to the 7 sub-committees. In such a way, their members only had to eventually agree on the assigned marks (as explained above) to see all the subsequent calculations made and radar charts plotted. As such, the SEC subcommittee members wrote down their comments and injected the marks in the spreadsheets and validated them after discussing their findings. The SEC chairman and the RAQ double-checked all the findings and re-discussed them with the relevant subcommittees whenever needed. A major strife of all the members was to be as objective as possible.

### 4.4.1 Methodology of the Self-Evaluation

Having obtained the radars for any given domain references and a global radar for all the domains, a domain report was drafted by each subcommittee expert evaluator with members of his/her subcommittee, and recommendations were made for the improvement of the domain references. The domain reports were reviewed by the SEC chairman and feedback given to each subcommittee. The SEC chairman wrote the global report which was sent to all SEC members for comments and validation. Once this first draft SE report produced, after taking into account all the members' feedback, the report was sent to all the university stakeholders who got interviewed for reading and possible comments. These comments were taken into account to produce the final SE report that was presented on the 6th of July 2017 to the various USTHB stakeholders and the printed report was officially given to the university chancellor who forwarded it to the Ministry of Higher Education and Scientific Research.

### *4.5 The Evaluation Results and Analysis*

At the end of the self-evaluation of USTHB, out of the seven domains selected in the RIAQES, the university obtained the following results (Table 4).

These results are represented in the following global radar chart (Fig. 2).

Beyond the actual results, what is important here is that a major self-evaluation was done with a very dedicated SE Committee. The attentive reader might ask the question about the fairly average results of the Teaching (2.31, or 57.75%) and Research (1.79, or 47.5%) domains which are supposed to represent the strengths of USTHB. It turns out that, despite the university's long experience in these two areas in particular, the skilled faculty members it has, and the quality of teaching and research that are produced there, there is no doubt that there is still a lot of work to be done in terms of quality assurance, traceability and transparency of what is being done. Practices that have become standard in modern universities must absolutely be strengthened at USTHB.

This self-evaluation has highlighted a number of very interesting lessons pertaining to the process of Self-Evaluation. Since what is of interest in this chapter is more the lessons learned in the process of introducing QA in an Arab university, rather than the actual marks and analyses, we will discuss what we think is important with this respect.

Some of the positive points to be mentioned here, is that the Self-Evaluation Committee was determined to be as objective as possible in its interviews and ratings. This is due to the fact that the members of the SEC were hand-picked based on their expertise in, or at least familiarity with, QA practices and procedures. The members were also selected for their good reputation in their respective departments/administrative units. This has proven important to carry out a titanic task within a relatively short period. A related point here is the importance of having a chair of such a large QA committee who has good QA in HE experience and who is well respected by his peers and the administrative staff. He/she must have good leadership, PR, and communication skills that allow him/her to convince the SEC to get committed to the task no matter how complex and tough it may be perceived. Communication is important throughout the process as it not only keeps the SEC

**Table 4** Results of the evaluation of the seven domains

| Domaine | Calculated mark for the domain (/4) | Calculated mark for the domain (%) |
|---|---|---|
| Teaching | 2.31 | 57.75 |
| Research | 1.79 | 47.50 |
| Governance | 1.83 | 45.75 |
| Infrastructures | 1.84 | 46.00 |
| Life on campus | 2.03 | 50.75 |
| Relations with the socio-economic environment | 2.17 | 54.25 |
| Cooperation | 1.68 | 42.00 |

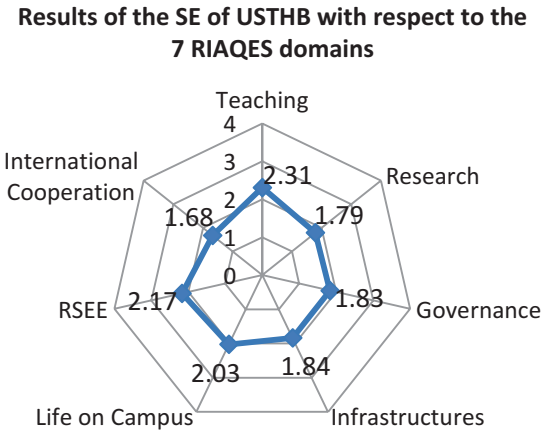


**Fig. 2** Radar chart for the evaluation of the seven domains

members on track with respect to what is being done at any phase, but it also gets their doubts and questions answered in a timely fashion. It is interesting to mention that though 6 out of the 49 original members of the SEC gave up, this happened from the very start, which shows a lack of commitment from the beginning, even before the SEC started being introduced to the task ahead.

Another important point that we have noted is the importance of having the very top administration committed to the SE effort. In our case, this was made easier by the fact that the decision to go through SE in all HEIs came from the MESRS. Nevertheless, the chancellor showed an unwavering commitment to getting the SE done within the planned timeframe. He translated this into clear, strict directives to all the university top administration (vice-chancellors, Secretary General, Deans) who, in turn, passed on their own directives to the various stakeholders. This backing from the very top administrators has tremendously facilitated the task and produced a very constructive and cooperative attitude from all.

One third point which has made the SE task easier to bear is that USTHB exists in its current location since 1974 and is the continuation of the University of Algiers which exists since 1909. As such, its administration and practices are quite refined on the various domains, even though some turned out to be still under-developed (such as the relations with the socio-economic environment). For instance, all the aspects related to teaching and research are well established (though they need some strengthening through the introduction of various QA procedures).

The various evaluation teams were received in a very cordial and cooperative way by all the actors of the university, including by the chancellor, which shows good awareness of the importance of the introduction of QA practices. The interviews were very constructive, and it was clear that each actor and member of the SEC had the same goal: to make the self-evaluation an important step in the qualitative improvement of the performance of the university.

On the weaker points that the SE task has highlighted one can mention the fact that it was to be done within a very short period (4 months). This is way too short for a very large university like USTHB, especially that most of the members of the

various sub-committees are faculty members and doctoral students. This means that they also have their own teaching and research commitments. Thus the pressure has been tremendous on them to do everything in parallel.

Another hindrance, which was also a weakness in the relevant governance references, is the weakness of the Information System and the archiving procedures that are used at the university. This has made it more difficult for the SEC team to have access to various evidences, forcing them to rely on physical checks of documents, instead of online checking of many of them. Related to this is the fact that USTHB has well established traditions in terms of organising the teaching, research, and other aspects in the university. However, there is a need to work much more on the procedures as well as the traceability, visibility, transparency and communication between the different units and stakeholders. The lack of traceability makes it difficult for a committee that does self-evaluation or even external evaluation.

One more aspect that needs to be discussed at the ministry as well as the university level is the fact that the evaluation is quantitative. It is true that there is plenty of room to include qualitative remarks with respect to the various references, criteria, and evidence. Nevertheless, it is required as explained in Sect. 4.3 above to insert marks for the various evidences and criteria which then get combined into overall computed marks. This quantisation of the evaluations raised the fears of various stakeholders who expressed their resentment that the SEC at USTHB might be fairly "strict" in its mark assignments (as is usually the case in course grading at our university) compared to SECs of other universities that might be looser on marks. Thus what is at stake here is the subjectivity of mark assignment and the danger that various people may have different perceptions of the quality of an evidence or a criterion, which ultimately translates into quite different marks depending on the "nature" of the evaluator. It may be important for the members of the MESRS CIAQES to ponder this point and see whether it is not more interesting to go for qualitative assessments of the various references and domains.

## 5 The Ministry of Higher Education's Assessment of the QA Self-Evaluation Effort

According to the report prepared by the MESRS CIAQES [10] in which a compilation was made which summarised all the Self-evaluations that were done at the national level by the various HEIs, it turns out that 82.1% (i.e. 87 out of 106) of all HEIs went through the SE process during roughly the same period (February to June 2017). Till early July 2017, only 51 had submitted their SE final reports to the MESRS. Out of these, 14 covered the 7 domains, 1 covered 6 domains, 2 (5 domains), 6 (4 domains), 5 (3 domains), 11 (2 domains) and 12 (1 domain).

These results show a fairly good commitment to the task of self-evaluation, 82.1% having periodically sent their progress reports during the SE period. What is worrying, however, is that the various SECs did not feel under pressure to evaluate

all the 7 domains (only 14 of the 51 reports covered them all). In the worst case, 12 HEIs covered only one domain which is way too little. The idea is that this first step of SE will be followed by external evaluations to be done by Evaluation Panels to be designated by the MESRS. As such, one can hardly see how uniform and useful such external evaluations will be if they approach HEIs that had different coverages of the RNAQES domains.

## 6 QA Challenges

### *6.1 Obstacles Faced by the SEC Members*

In addition to the analysis that was presented in Sect. 4.5, a number of points should also be mentioned here.

The central role of « authority » in the Arab World: It was mentioned above that the fact that the MESRS had decided to launch a national SE effort at the various HEIs has had the positive impact of putting pressure on these and their chancellors to carry out the SE and take it seriously. Despite the fact that only a small ratio of the HEIs covered all seven domains of the RNAQES, one can say that the central role of the MESRS has been positive in the sense of getting most universities to do the SE. Nevertheless, one wonders if QA practices can really be enforced from the above. Ideally, QA should be introduced from the bottom, i.e. at the HEI level. This requires a complete programme with incentives and penalisation to get the faculty members and administrative staff to take various trainings and get involved in the QA implementation. The main objective should be a shared one of improving their HEI performance and, why not, world ranking. Besides, is it the right approach to get all HEIs to be copies of one another in what they are supposed to do and how they are supposed to be evaluated? Is there no other approach that enforces some general guidelines upon all HEIs while giving each one enough room for individual manoeuvring and innovation, bringing to the forefront the specifics and own "character" of each HEI?

Related to this last point is whether the MESRS should rather think of a variable evaluation, i.e. one that distinguishes between a young versus an established HEI. Can all institutions be evaluated the same way, the one created in 1910 and another one in 2010? How can one balance out between quality in younger HEIs and the quality requirement? Can they be expected to display as much quality as much older and more established HEIs?

Another challenge concerns the RNAQES: is it too detailed? On the positive side of the balance this has the advantage of setting some common grounds upon which to compare various HE institutions. Moreover, this forces the HEIs to be aware of and pay attention to a lot of relevant aspects (references and criteria) and work on traceability (evidences). With time, this can have a spiral improvement effect on the overall quality of the institution.

On the negative side of the balance, one may mention the disadvantage that the large number of references with too detailed criteria and evidence makes it difficult to find a documentation of references and criteria that are actually covered but not traceable. This logically affects the reference mark negatively just because of lack of evidence. The fact that there is a large number of references is bound to have a negative impact on the overall evaluation of the various domains.

One may find it paradoxical that the USTHB graduates are very much valued in Europe and North America, and the research production is qualitative and quantitative, but the SE results were rather average on the teaching and research dimensions. Does this mean that the references defined for the various domains are not that adequate to reflect the strengths and weaknesses of the evaluated HEIs?

One challenge that has a major impact on quality is the "massification" phenomenon in HE. Indeed, thousands of new students (holders of the high school Baccalauréat) are enforced upon the various HEIs each year. As mentioned above, more than 8000 new students enrolled at USTHB at the beginning of the academic year, and this is roughly the same thing every year. The number of students in each BSc and MSc programme is too large, putting more pressure on the availability of teaching infrastructures and equipment as well as manpower. How can a faculty member find enough energy to teach when the sections and groups are too loaded? This in turn has a negative impact on various references, criteria, and evidences. This applies to the Teaching domain, as well as Research, Life on Campus, Infrastructures, etc.

Despite its large coverage of the various domains and references, the national QA framework did not appear to us as putting the student at the centre of the QA effort. This is an important philosophical underpinning which is widely argued for in the recent approaches to QA in the world [11]. It is also an issue that tells a lot about the way things are being envisioned at the MESRS level.

All the above require a careful analysis at the Ministry's CIAQES to hopefully find the best fine-tuning of QA in Higher Education Institutions. Failing to do so, the whole effort may turn out to be so wasteful in the long run.

## *6.2 Follow-Up (Closing the Loop)*

One of the major fears of the SEC members at the start of the SE journey was their conviction that nothing would be done to implement our recommendations. It is a very dangerous belief if university stakeholders are convinced from the start that nothing positive will come out of the whole enterprise. This has required a lot of communication and convincing by the SEC chairman to get the members to get fully involved. Thus one major point is for the MESRS and the USTHB top administration to ensure that the recommendations made in the SE report get implemented,

since the whole report was considered as very critical but very constructive at the same time.

More recently, the MESRS has started sending panels to do the external evaluations of the various HEIs. It is hoped that this will be followed by binding recommendations to be implemented by the various institutions. In other words, it is crucial to enforce the acting upon the results of the internal and external evaluations (closing the loop).

The MESRS should also ensure that all HEIs implement the seven domains since the approach is a centralised one. This will have the positive effect of setting grounds for comparisons between different HEIs, when the external evaluations get performed.

Last but not least, it is high time that the Algerian Government created a National QA Authority which is independent from the MESRS. Its role would be to oversee all aspects related to QA, the QA framework, etc. It could even cover QA in HE as well as in primary, junior and high schools. It is said to be in the plans; but it needs to be quickly concretised.

## 7 Conclusion

We have presented in this chapter a major effort that was launched by the Algerian Ministry of Higher Education during the Spring of 2017. The effort consisted in getting all Higher Education Institutions to go through a Self-Evaluation process. Having defined a National QA Framework (RNAQES), the MESRS ordered all HEIs to create a Self-Evaluation Committee whose task would be (1) to customise the RNAQES to the needs of its HEI (producing an Institutional QA Framework, RIAQES), and (2) to go through the self-evaluation of the HEI according to the RIAQES thus produced.

We have started by presenting the RNAQES and its seven domains (1) Teaching; (2) Research; (3) Governance; (4) Infrastructures; (5) Life on Campus; (6) Relations with the Socio-Economic Environment; and (7) International cooperation. Then we explained how the SE of USTHB was carried out, and required not less than 43 members to cover the 7 domains and all the university administrative units and 8 colleges.

We have closed this chapter by discussing the challenge of organising Self Evaluation for a university of the size of USTHB and the main lessons we have learned from the Self Evaluation process as well as some return of experience from the evaluation.

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# Higher-Education Relevance in Post-War Syria


**Hani Mourtada**

**Abstract** This chapter aims to provide an overview of social relevance in the higher-education system in post-war and reconstruction Syria. A synoptic literature review is given on the evolution of Relevance in higher education. The review includes foundational documents issued by the European Commission, World Bank, and the Syrian Ministry of Higher Education. A critical analysis ensues on what was done in Syria during the pre-war years. Next, an overview is given of possible venues of effecting social and economic relevance in the prospective post-war era in Syria. This includes a summary of the possible intervention paths and methods, and the need for viable and sustainable connections between universities, state polices, and social needs. Defining the parameters of relevance in reconstruction Syria will include suggestions on enabling the higher-education system to be not simply a producer of graduates well-equipped for the future job market(s), but also as an incubator of relevant research and business ventures. A dynamic, relevant and quality-assured higher-education system in Syria is a powerful tool for the success of the reconstruction process.

**Keywords** Syria · Syrian war · Post-war relevance · Reconstruction · Higher-education relevance · Social relevance of university · Role of university · Post-conflict recovery

The progenitors of the modern-day university, be they the earliest precursors of Kairawane and Azhar in the Arab world, or the first European institution of higher learning in Bologna, Italy, were meant to be institutions of learning and training for the social and religious elite in their respective societies. The effective functions of these precursors were, therefore, connected to the roles they were expected to play by the very political and/or religious hierarchies that decreed their creation, patronized and funded them, and often monitored their performance. Since education in

H. Mourtada (✉)
Damascus University, Damascus, Syria
e-mail: hanimourtada@yahoo.com



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_18

the pre-modern world was *not* for all, its relevance was not really social but rather political. It can be argued that it is not until the late enlightenment in Europe, and post-civil war in the United States, and the subsequent rise of the middle classes that the elitist nature of higher-education institutions began to change.

The modern university as we know it is a product of the twentieth century, especially of the post WWII era in Europe, the United States, and the industrialized world; and in the post-independence developing countries, including Syria and the Arab region. The proliferation of higher-education institutions around the world during the past century can be predictably attributed to a number of factors including: the rise of the modern state, the regulatory approach to education within overall national development plans, and the continual emergence and dominance of the middle classes in many societies around the world. Within the framework of these factors, we can observe a shift in the meaning of Relevance in universities around the world. That shift has taken place over the decades of the second half of the twentieth century. The slow shift can be attributed to the fact that systems of higher education are at times shackled with traditions and are therefore often slow to respond to the dynamics of social and economic changes locally and globally. This explains why faculty and students in academia have often been viewed and depicted, indeed have also viewed themselves, as living in a bubble insulated from the "real world."

The romantic image of the university was that it is a place that nurtures core academic values and enables students and faculty to exchange and produce knowledge (at times in the most abstract sense of the word). However, the social demands of the students, the imperatives of the job markets, and the political expectations of funding entities (governmental or non-governmental) necessitated the gradual but sure shift to the definition of "Relevance" as we universally know it today. It is no more simply the production of knowledge for the sake of its production, but the production of knowledge that is of use both for learners and for society. The European Commission's education and training documents define this dynamic essentially by connecting relevance to qualities assurance:

> High quality and relevant higher education is able to equip students with the knowledge, skills and core transferable competences they need to succeed after graduation, within a high quality learning environment which recognizes and supports good teaching. [1]

The thrust of this definition is in the emphasis on the fact that the knowledge, skills, and competences should be the ones that the student needs to succeed in the job market. Education, therefore, is relevant in only as much as it serves the learner's post-graduation aspirations for upward mobility in life. Quality assurance in this sense is not a purely academic endeavor. The product of QA cannot simply be tailored to meet the expectations of pure academic excellence in the most abstract sense of the word, but it should also be designed to meet the needs of *real life* beyond the university. In other words, quality assurance is viewed here not as an end in itself but as means to an end: 'success after graduation.'

Today, such a definition of relevance seems to be universally embraced, encouraged, and propagated. Important questions, however, remain: How can the required

skills and competences be defined in each discipline? The answer seems to be almost always conditioned by "who" defines them as well. Are academicians living in their "bubble" well equipped to provide answers by themselves? Or should other stakeholders be involved, and if so then who? And to what extent? Even when the intended learning outcomes (ILO's) are defined, subsequent questions arise. What type of training/teaching curricula can be put in place to achieve them? Are they measurable? Are they mandatory within a given national higher-education system? Are there independent agencies to monitor and measure them? Are there National Academic Reference Standards (NARS)? Who oversees their implementation? All these questions emphasize the connectedness between social relevance and quality assurance in the modern higher-education setting.

The attempt to address these questions cannot, and should not, come up with universal answers that can be equally applicable in post-industrialized and developing countries. Numerous studies have addressed over the past century the issue of defining the roles of higher-education systems in developing countries. Some of the main challenges facing planners and governing agencies in these countries include, according to Altbach, include but are not limited to: dealing with the colonial legacy, responding to massification of higher education, relevance to a public good and quality [2]. Balancing relevance with the public good becomes a tenuous task. As Altbach puts it succinctly:

> The challenges are very great indeed: funding; balancing the consequences of massification with the maintenance of quality; supporting world-class professors; forming an academic culture dedicated to academic freedom, intellectual competition and meritocracy; and providing a quality education to undergraduate students. Developing countries, like the rest of the world, require a differentiated academic system, with mass access at the bottom and a small research-focused sector at the top. Mission differentiation is difficult to build where it has not existed previously, but it is central to a successful academic system.

Compounding the problems in developing countries are the military conflicts that many of these countries had witnessed particularly in the second half of the last century. In considering various paradigms of impact in these countries, differentiation is needed in establishing the investigative tools for looking into the predicament of higher education in post-conflict countries/regions. Whereas the massification of higher education in the twentieth century, both in developed and developing countries, has necessitated the search for universal standards, relativist approaches to their implementation remain vital. A hallmark for such approaches begins by integrating the academic world with wide-reaching development plans that address the needs of each nation separately. This is not a call for isolationism but rather a call to remind ourselves that whereas it is imperative for any academic institution today to keep an eye for international trends and practices, it is equally imperative to look into, even shape trends and practices at the national level.

In the case of Syria, the relativist approach becomes more pressing, not only for the scope of the countrywide infrastructure destruction, the extent of demographic shifts, academic brain-drain, and loss of contact with the world outside, but also because of the unique strides that Syrian higher education achieved in the pre-war period. Whereas the effect of higher-education infrastructure damage is yet to be

fully gauged and understood (and also normalized against effects of factors external to academia such as power sector, transportation, etc.), the impact on the human element is evident:

> Syria, once known for one of the most robust higher education systems in the region, took pride in its pre-war university enrolment of almost 30 per cent. Today, more than 200,000 Syrians outside their home country don't have access to higher education, while many institutions in Syria have shut down or are only partially functioning. We are in danger of losing an entire generation of Syrian students desperately needed to one day rebuild their country. [3]

The desperate cry in the words of Feldman and Miller at once highlights the extent of one aspect of the problem and masks another! A thorough search in various databases of the various approaches to address the higher-education crisis in the Syria demonstrates a disproportionate focus on the higher-education challenges facing Syrian refugees in their safe havens [4]. It is understandable that such persistent focus can be justified as an emergency response, but it lacks the foresight of planning for the day-after, once the conflict ends and the country enters a re-stabilization mode. A number of donating agencies have recently conducted a meeting at the American University of Beirut in an attempt to adjust this imbalance by considering ways of reaching out to students inside Syria. The result of this effort is yet to be seen. It is noteworthy that in either case such an approach tends to respond to individual student needs and does not attempt to look at the possibility of a sector-wide approach. The reasons of this inadequate intervention are almost strictly political as they relate to the position that various Western powers towards the Syrian government. The pressing question then remains: what are the possible venues to address the issue of relevance in the Syrian higher-education sector in the post-war era?

A World-Bank-endorsed recipe for integration suggests that it can be best achieved through "Mode 2" of education. Mode 1 is defined as the traditional pattern of education common in most academies in the twentieth century. Within the framework of this Mode, "universities are organized according to the structures of disciplinary science" [5]. The shift to Mode 2 implies that "knowledge production and dissemination – research and teaching – are no longer self-contained activities, carried out in relative institutional isolation. They now involve interaction with a variety of other knowledge producers." Simply stated, the involvement of 'other knowledge producers' means enhancing social and developmental relevance of the modern-day university. Highlighting the need not to view relevance in the twentieth century to be a one-size-fits-all model Gibbons [5] correctly suggests that:

> The kind of relevance that seems to be accompanying Mode 2 does indeed involve the closer integration of higher education to society and its needs. But this closer integration should not be conceived narrowly, nor can it be applied mechanically. As we have seen, collaboration amongst a wider range of social actors is now among the imperatives for the production of knowledge at the forefront of many of the most advanced areas of science and technology.

Integration as a tool to achieve relevance is therefore neither a "mechanical" process nor a ready-made silver bullet. Again, this argument highlights the importance of looking at specific situations with the intention of analyzing them in order

to find solutions relevant to their uniqueness. This is it true particularly in the case of Syria today.

The immediate question that comes to mind in considering the issue of social relevance in Syrian higher education today is the one connected with post-conflict Syria. The answer should include a review of the situation in pre-war Syria.

Higher education achieved immense strides in Syria during the decade preceding the war (2011–2017). Structural and regulatory changes were put into effect to change the very way Syrian Universities functioned and interacted with social needs and national development plans. Those strides came as a dynamic response to the legacy of the twentieth century. During the second half of the preceding century, most faculty member in Syrian universities were graduates of the countries of the former 'Eastern Bloc.' In many cases, and for a variety of reasons, many of these graduates did not get the proper training in their areas of specialization, and were thus ill equipped to provide up-to-date, quality teaching and/or supervision of graduate students and academic research. This predicament was compounded by outdated laws that suppressed initiative and discouraged modern practices of governance. Decision-making was highly centralized to the extent that changing a textbook for a course in any academic department required a decree from the highest regulatory body in the system, the Council of Higher Education. Additionally, salary scales for university professors were so low that brain-drain became a national phenomenon.

Empowered by the decision to effect a paradigm-shift in the Syrian higher-education scene, administrators of higher education in the first decade of this century carried out a massive reform process that resulted in diversifying tertiary education offerings, updating the laws to approximate, in many cases, international standards, and in an ambitious capacity-building project that changed the face of Syrian universities. Most of the new faculty members of the late 1990s and early 2000s were graduates of France, the U.K., and Germany. Curricula were revised, and the decisions to continually update them were now in the hands of the people who know how and when to upgrade them. There were new degree offerings, especially in IT and new engineering fields. All these changes, and many more, were justified by two key concepts: Relevance and Quality Assurance.

To insure that the graduates of tomorrow were fit for the market place, that they would be capable of both upward mobility in life and contribution to the social good, new actors were invited to participate in the process of modernizing Syrian higher education. These actors included international partners and the widest possible range of stakeholders beyond the ivory tower of the university. In effect, Syrian higher education was moving in the direction of Gibbons's Mode 2.

The war in Syria (2011–2018) caused this process to come to a screeching halt. In some cases, the effects of this continuing conflict was not only reversing many of the advancements of the previous decade, but even throwing the whole system few decades backwards. Now. as an end to the conflict appears on the horizon, the key question becomes: how would higher education be relevant in the post-conflict era? The immediate, and easy, answer appears to highlight the importance of engineering and health disciplines in such a way that would respond to emergent issues such

as post-traumatic stress syndrome, mental conditions related to conflict, burgeoning number of the disabled (amputees, the visually-impaired, etc.) in the medical field, and recycling of ruins and war debris, and the development and exploitation of new technologies in energy production in the various engineering disciplines. It is true that some of these areas of expertise appear to be more urgent than others. Yet, simply highlighting them and allocating resources exclusively to these technical/professional areas will make Syrian higher education more relevant for the short run as it will respond to the 'emergencies' of a post-war context. Such an approach will also echo the post-colonial development policies of the 1950s in the Arab world and elsewhere in the 'developing' regions of the world.

In hindsight, it is evident that this disproportionate focus on medicine and engineering has precluded the possibility of benefiting from such important areas in national development and post-conflict reconstruction as the whole range of social-studies disciplines. A relatively recent study done for the British Council, using the tools of sociology and psychology, has demonstrated the vital importance of relying on social sciences to "read" a society's proneness to such phenomena as religious extremism, even among doctors and engineers [6]. Needless to say, the demographic shifts, brain-drain, emergent social trends, and phenomena as a result of the Syrian conflict, and even as a consequence to any process of reconstruction, should not be treated as technical issues that the technocrats of government can address from the comfort of their offices. Planning for reconstruction cannot be simply a process of reading figures of damaged or destroyed infrastructure or numbers of functional health centers and hospitals in an area plagued by war. If reconstruction is to be meaningful then universities have to be involved in conducting studies, doing research, and preparing graduates in all disciplines, not only to alleviate the pain of post-war conditions, but also to suggest approaches, plans, and vision that would prevent, or at least reduce, the possibility of future conflicts. Understanding the significance of empowering the universities to improve their output in social sciences and humanities makes them more relevant in post-conflict contexts.

During the first three decades of the twenty-first century, numerous studies have offered analyses and suggestions for the potential role of higher education in post-conflict recovery. Two texts offer theoretical glimpse into some trends of recovery and what could be effective approaches to address reconstruction of education. A World Bank document, *Reshaping the Future, Education and Post conflict Reconstruction,* suggests that enrollment figures usually level up to pre-conflict figures in relatively short time [7] thus highlighting the need for plans to be set for immediate intervention during the reconstruction stage. The report rightly highlights a more capacity-building approach as a priority in the early stage of reconstruction rather than the unfortunate practice of focusing mainly on physical facilities and infrastructure. Published in 2005, the World Bank document states that secondary and tertiary education is often better served than vocational training during post-conflict stages. Sansom Milton, in a 2018 publication [8], disagrees:

> In the search for new and more effective approaches to post-conflict recovery, the higher education sector is long overdue a serious reappraisal. While basic education has emerged as an increasingly important sector in conflict settings [9, 10] and is now viewed as a fourth

> pillar of humanitarian action [11, 12], the higher education sector in conflict-affected societies remains neglected in terms of both policy and research. The burgeoning literature on education in conflict, emergencies, and reconstruction [13–17] does not frequently address higher education and the sector docs not figure prominently in research on reconstruction and recovery in conflict-affected societies. [8]

Milton's analysis, informed by a decade of conflict following the World Bank text, and arguably by an analysis of the Syrian situation, appears to reflect accurately the international approach to recovery, and the dilemma that the higher-education sector may face in the years following the end of the war. To date almost all interventions by UN agencies and international non-governmental organizations in Syria focus on pre-tertiary education. The tremendous potential of tapping into higher education as a tool of "disarmament, demobilization, and reintegration" (DDR) [18] seems to be overlooked in Syria. Milton provides numerous examples of the efficacy, and at times failures, of the DDR model. A common approach in post-conflict context is to mobilize the higher-education sector in the process of providing former combatants with the skills needed for their reintegration, not only into civilian life, but even to the process of peace-building and economic revitalization.

Revisiting the three 'missions' of higher education (teaching, research, and public service), Milton elaborately demonstrates how new modes of teaching can contribute to the harnessing of critical-thinking skills which he convincingly argues are better tools of "immunizing the mind," to quote Martin Rose's study [6], than the outdated rote-learning approach predominant in many universities in the Arab world. Milton's recipe includes the introduction to higher education programs of new areas of study such as "conflict resolution" at both the undergraduate and graduate levels. In such areas critical-thinking and analytical skills come almost as a second nature to the existing literature and to pedagogical approaches.

In the case of post-conflict Syria, the introduction of conflict resolution degrees and curricula is vital. However, as Milton notes, this approach is replete with potential dangers of raising sensitivities and "being met with hostility" by some stakeholders. In many cases, such programs are offered too early into the process of peace-building when animosities are still fresh [19]. An added limitation relates to the disciplinary approach towards teaching negotiation skills and conflict resolution as degree programs within the humanities only. To alleviate this limitation there is a need to consider, soberly, two facets of existing practices in the Syria context. The first lies at the core of the content of teaching material in such degrees as history and philosophy, which often tend to aggrandize a sense of a "pure past" that stands as a stark contrast to the gloomy predicament of the present. The second is the introduction to professional degree programs (medicine, engineering, etc.) of courses that includes elements of critical-thinking, cultural, and cross-cultural studies, and conflict resolution.

Both Milton and Rose have seen an alarming surge and/or evidence of embracing extreme ideologies among graduates and practitioners of the "elite" professional programs, thus deconstructing the common stereotype that terrorism is inherently connected to poverty and to lack of education. A pioneering effort at the Department of English Language and Literature, Damascus University, resulted in the offering

of a course entitled "Introduction to Cultural Studies," 1 year before the eruption of the conflict in Syria. Throughout the years of the Syrian war, this course, because of its focus on critical-thinking and analytical skills, offered a venue for developing the learners' negotiation skills, consensus building, and conflict resolution. Extending such an experiment beyond the confines of humanities through a discipline-friendly replication of various areas of study may constitute a paradigm of emulation for the relevance of the university in post-conflict recovery.

The second mission defined by Milton, 'research', is a tool of analyzing intercultural conflict, social phenomena, and the interplay of various intrinsic and extrinsic factors in the psychology not only of conflict but of recovery. Milton outlines the latent potential in research connected not simply to physical reconstruction, but to communal recovery. The "healing" process of peace-building cannot be simply in responses to material needs, which again can be vital in the short term, but also in the serious investigation of the roots of conflict via an interdisciplinary approach which employs the scientific tools of research independent from political posturing and power-politics. In this sense, Syrian universities have a possibly vital role in encouraging, incubating, and nurturing research on conflict causations, anticipation, and prevention. Timid initiatives were started in 2014 to orient a great deal of research capabilities in Syrian universities and affiliate research entities to "reconstruction efforts" [20].

The third mission of the university is public service. In this capacity, the relevance of higher-education institutions is more difficult to define than their impact with the other two missions. The difficulty of understanding the scope of what public service means could in itself provide the space for a wider scope of actions that contribute to the processes of reconstruction and recovery. The word "university" from the original Latin *universitas* means "the Whole." The Arabic equivalent *jāmiᶜa* is the active participle of the root j-m-ᶜ, meaning to bring together and consolidate. Modern universities have, in varying degrees, played this role of creating a space of equity, bringing together stakeholders and players from various economic, ethnic, religious, cultural, and national backgrounds. A university, by its very definition and function is a space of integration, not simply to incubate diverse students and faculty in a 'bubble' insulated from the harsh realities of the world outside, but rather as a space that harnesses teamwork, the spirit of a community, and of belonging to shared goals and missions. Within the framework of this function, public service can mean a host of features and activities that contribute to the stabilization of a society in a post-conflict context. If a sense of community is effectively nurtured in the Syrian universities after the war, then at least two benefits can be harvested. The first is the ripple effect, which students and graduates can carry back home with them to redress a sense of inter-communal mistrust or suspicion. The second lies in instilling a culture of volunteering and work for a public good among the university population, through seminars, workshops, and actual "reconstruction" activities in war-damaged areas. The seeds for this role are already manifest through the individual initiatives of diverse student groups in Syrian universities, to help in the rehabilitating public primary schools and health centers in the areas most-damaged by military actions.

University relevance in this sense in the case of Syria, on the medium to long term, becomes a social responsibility, not to produce graduates for the future job market, but also to protect that future in all ways possible.

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# Unified National Medical Assessment: An Approach Towards Meeting the Needs of the Population During the Syrian Crisis


**Mayssoon Dashash**

**Abstract** The Syrian crisis has tremendously affected the process of quality assurance in universities and prevented medical institutions from achieving accreditation. The focus on traditional teaching and hospital-oriented education has prevented the appropriate response to community needs. Medical Faculties are struggling to modernize and to move towards an integrated model that can produce health-oriented professionals who are able to work for health promotion, disease prevention, and cure. There is a need to shift from a focus on what happens in medical faculties to what is needed in practice. The production of health professionals in the required numbers and adequate quality is of critical importance. It is essential for both health and education professionals to recognize that learning in communities, through the education-health partnership have many advantages. Moreover, it is of critical value to maintain minimum standards of medical education in fragile contexts and to produce competent graduates who are able to provide the best appropriate urgent care to Syrian society. The Unified National Medical Exam UNME has been utilized as a standardized assessment tool for measuring the output of universities and assessing the quality of the education in medical schools affected by the current conditions. The UNME is designed to make sure that the learning outcomes have been achieved so graduates can provide safe and high-quality health care to patients. It is the simplest and the least expensive tool that has been implemented to assess the competencies of all graduates, and to provide feedback and to measure student performance, effectiveness of the teaching situation, and assess appropriateness of the content input. The UNME has achieved its goal in fulfilling the requirements of the current demanding situation. National assessments, including the UNME, have been a bright spot in the history of Syrian higher education despite the difficulties faced. It proved a success for its validity, reliability, integrity, transparency and ability to stimulate students, teachers and universities despite the circumstances. The implementation of the UNME, its methodology, challenges, and achievements will

M. Dashash (✉)
Damascus University-Centre for Measurement and Evaluation in Higher Education, Ministry of Higher Education, Damascus, Syria
e-mail: mdashash@yahoo.com



A. Badran et al. (eds.), *Major Challenges Facing Higher Education in the Arab World: Quality Assurance and Relevance*,
https://doi.org/10.1007/978-3-030-03774-1_19

be presented. The adoption of innovative approaches is vital and the presence of relevant curriculum, which directly responds to increasing community needs, is the major step towards decreasing the burden on education and health systems in Syria.

**Keywords** National assessment · Measurement · Syria · Crisis · Accreditation · Standards · Community orientation

## 1 Introduction

Remarkable progress has been made in quality assurance in recent years, and most of the higher-education (HE) sectors have fundamental policies, structures, and processes. Most HE institutions (HEIs) have a strategic document either at institutional or at faculty level in place [1].

The system of quality assurance started in Syria when the Ministry of Higher Education [2] led an initiative in 2005 and invited all public and private universities to self- evaluate their academic programs and develop standards for quality and academic excellence. See Fig. 1 for the proposed structure for quality assurance and accreditation in Syrian higher education.

In 2010, a national plan for the development of programs and curricula of higher education was adopted. The National Academic Reference Standards (NARS) for 17 academic sectors were designed [2]. For instance, NARS for the health sciences

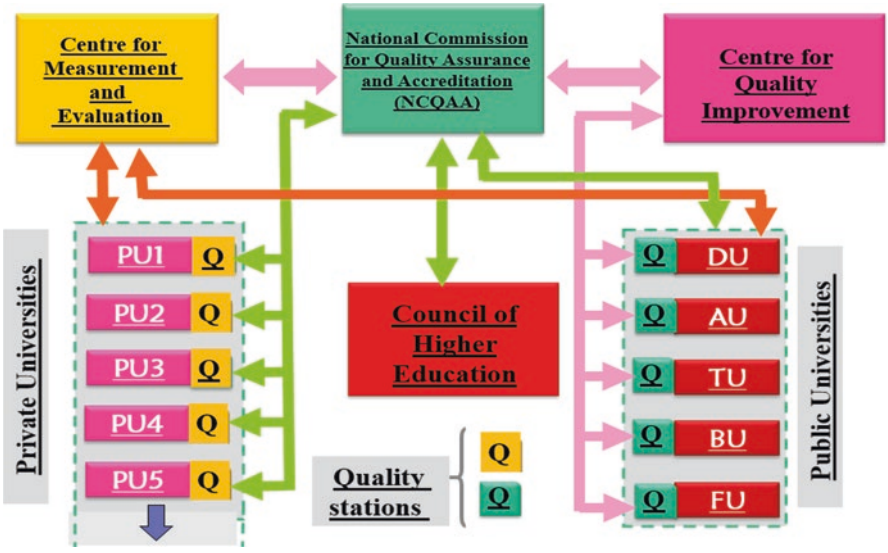


**Fig. 1** Proposed structure for quality assurance and accreditation in higher education. *DU* Damascus University, *AU* Aleppo University, *TU* Teshreen University, *BA* Al-Baath University, *FU* Al-Furat University [4]

sector (medicine, dentistry, pharmacy and nursing), which define the minimum essential knowledge and skills needed for students before graduation, have been identified at national level [2]. Curriculum reform became a priority for Syrian Universities in 2009 [3, 4].

Positive acceptance at a senior level of government has helped planning to reform the curricula in order to reflect the achievement of high-order learning and mastery rather than the accumulation of course credits [3]. Several approaches have been adopted in order to implement outcomes-based education (OBE) in which the focus would be on what is essential for students to do successfully at the end of their learning experiences so they can have the necessary skills and knowledge before practice [5].

A critical appraisal of the current situation was undertaken in 2011, in which the desired learning competencies were determined firstly for graduates in medical schools in the light of the NARS, Syrian population needs, and international trends [5]. However, the Syrian crisis has tremendously affected the process of quality assurance in higher education and prevented institutions from achieving accreditation and implementing the national plan in 2012. The destruction of infrastructure because of the ongoing violence and economic sanctions has affected education and health [6]. The increasing burden of universities in settled areas has prevented staff from following the quality-assurance process, undertaking self-evaluation to their programs or even improving their curriculum according to the needs of the community. Damascus University and Teshreen University, in particular, have been under tremendous pressure since they were to some extent, settled universities, and had to accommodate the largest possible number of teachers and students who moved from different unstable areas because of violence, stress, or destruction of accommodation and belongings [6].

At this stage, the focus has been on continuing the educational process, increasing the number of examinations as well as supplementary and additional courses in order to respond to the pressure of the Syrian Student Union. This has made applying accreditation rules formulated previously by the Ministry of Higher Education (MoHE) impossible during the current circumstances, and consequently, has negative impacts on educational environment, quality of curricula delivered, and graduates [7].

The MoHE has been unable to follow up institutions, to undertake regular evaluation, to perform auditing of programs, or to invite external referees in order to evaluate programs and curricula that were previously planned, or to make sure that accreditation rules are being applied due mainly to massive flows of Syrian HE scholars outside the country [7]. Moreover, it has been impossible to create a national accreditation body due to the lack of human and financial resources, since the MoHE had to suspend study and lessons in some major universities such as Al-Bath University in Homs, the branch of Aleppo University in Idleb, and Alfurat University in Dier Azzour, and redirect students to other universities [7].

When all internal and external indicators of the Syrian crisis show that education has become a luxury, it is important to remember that the education is not only a right, but in emergencies, like in Syria, can provide physical, psychosocial, and

cognitive protection [8]. It can mitigate the psychosocial impact of conflict and disasters by giving a sense of stability and hope for the future. It can provide students with critical survival skills and information about safety, disease prevention, conflict resolution, and peace-building [8].

The current situation in Syria demands maintaining minimum standards of higher education in fragile contexts and producing competent graduates who are able to provide the best appropriate urgent care [8]. The MoHE has several approaches in order to maintain the educational process in Syrian Universities and to maintain the minimum standards during Syrian crisis as described in the following sections.

## 2 Adoption of a Strategic Triangle: "Retention, Productivity, and Performance"

The MoHE adopted a strategic triangle for Syrian higher education during crisis, which underlines the importance of continuing attendance, training, and success. The elements of the triangle "*retention, productivity and performance"*, which were previously suggested [9], are shown in Fig. 2.

The first side of the strategic triangle deals with "***retention***" in which the attempt was to help students to stay in the university and to reduce the number of dropouts. The MoHE has several successful approaches in increasing the retention of students. It created co-ordination offices in all settled universities for all students who came from other universities. This approach has been very essential, particularly for students who moved from different cities, faced more challenges, difficulties, and struggled to meet their educational needs.

The collaboration between the MoHE and National Student Union has been highly successful in order to create opportunities for students to meet others with

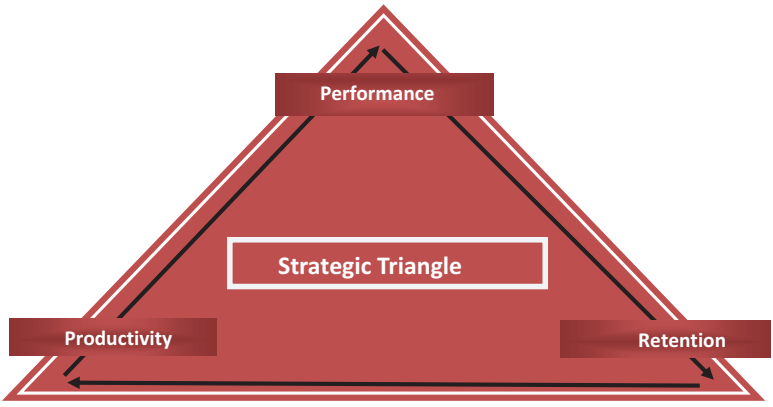


**Fig. 2** A strategic triangle "Retention, productivity and performance"

similar circumstances, reduce the stress of transition, recognize the importance of continuing education, and maintain interest in university.

The second side of the triangle is the "***productivity***" component. The main activities of this strategy has been to increase the productivity of students, particularly those who came from affected governorates, which are outside the control of the government and legal authorities, through supporting their academic life, helping them cope with circumstances, offering study opportunities, designing databases and uploading missing information and lectures.

To increase *productivity*, the MoHE established two public universities: Tartous and Hama Universities, in response to demographic changes in Syria because of the current crisis and in response to the demand of specific graduates by the labour market. In addition, the development of Technical and Vocational HE in Syria is part of the higher-education reform plans, which responded more quickly to the variation of demand for qualified technical graduates in the local labour market during the crisis [7].

The final side of this triangle deals with "***performance***". This refers to the progress of students. The main role of universities has been to improve the attitude of students towards continuing their education, increase their self-confidence and pride in achievement. To achieve this, the MoHE has several challenges and questions to be answered in order to assure the quality of graduates during the crisis as follows;

- What are the minimum acceptable standards for higher education in Syria during the crisis?
- Which standards should we use? Should we continue the process that were previously planned and seek for regional and/or global standards?
- Are we going to start with the settled performing schools?

This side of the strategic triangle opened doors for frank discussions on issues that no one would raise in the past. Higher education in emergency circumstances, student mobility, non-traditional teaching and learning methods, alternative assessment methods, student-centered approach, licensing, recognition, international standards, and accreditation, are some of the new concepts that have been introduced and have changed the academic culture of Syrian Universities.

In fact, HE that is likely to be engaged with disaster situations and human conflicts, has a responsibility to develop the capacity to prepare, mitigate, and respond to catastrophic events to minimize the economic and social damage that may result in society [8]. Moreover, it is a vital means of providing undergraduate, postgraduate academic staff, and professionals with insights into the purpose of educational programmes undertaken in schools located in vulnerable areas and the way that should be organized to meet population demands. It addresses the social responsibility and accountability, the role of the knowledge base and professional values in which health services are disturbed. However, this has not been an easy task. Limited financial resources, inadequate available electronic libraries, and insufficient available experienced auditors and assessors, have negative impact on achieving the desired outcome. To solve this, two main approaches were adopted; the top-down approach, which is carried out by the MoHE, and is

determined by its leadership and the bottom-up approach, in which the initiatives are taken by academic members in institutions through improving the quality of their graduates. These two approaches have been useful to emphasize the interplay between members of university, commitment of senior leadership, and involvement of faculty members and students. In this regard, the MOHE has played a critical role to promote implementation of quality assurance in HE through adopting new legislation related to a quality-assurance system in response to challenges and circumstances faced.

## 3 Assuring the Quality of the Output of Syrian Universities During the Crisis

The Centre for Measurement and Evaluation in Higher Education – CME (www.newcme-edu.net), which has been established during the Syrian crisis in 2012, as independent scientific national body, has to demonstrate the highest level of professionalism with regard to transparency, justice, social responsibility, and adherence to international quality assurance and accreditation standards [10]. The CME has been under tremendous pressure to work mainly on improving the quality of the output of the Syrian Medical Schools in response to the requirements of international standards and needs of local communities [10]. There has been an urgent need to meet the requirements of the World Health Organization [10] and to maintain the quality of Syrian medical schools, according to the standards of the World Federation of Medical Education [11]. The current situation demands actions to solve problems related to weak public-health surveillance system, limited access to clean water and sanitation, interrupted vaccination programs and lack of appropriate care during labor, delivery and postpartum, and restricted access to specialized tertiary care [6]. In addition, the situation demands health professionals who can put patient care above self-interest and manage vulnerable groups, who are severely affected by the emergency, have reduced coping mechanisms, and limited access to appropriate services or support networks [6].

Taking into account the increased number of people with permanent disabilities, traumatic injuries, hearing impairment, psychological trauma and mental health problems, the need to supply society with a knowledgeable, skilled, and up-to-date cadre of health professionals is of critical importance. They would effectively respond to emergencies and reduce the threat posed by hazards, and the impact of disasters [6].

The MoHE has taken responsibility for setting rules that enforce all Syrian graduates to pass a standardized national exam, designed and supervised by the CME, to satisfy the country's health needs before graduation. However, the CME has also the responsibility to provide insights into medical curriculum to be planned, teaching, learning and assessment methods to be adopted in fragile contexts, with quality-assurance processes to be developed to equip health professionals to prepare adequate policies and provide sufficient emergency supplies.

## 4 Assessing the Syrian Medical Education During the Crisis

Syria has a long and bright history of medical education in the region and the world. The first medical school in Syria was established in 1913 as one of the pioneer schools in the region. The need for modernization and quality improvement in medical education is linked with the remarkable increase in the number of medical schools in Syria over the last few years, as well as the need to improve the quality of health services to respond to population needs during the Syrian crisis. Five public (Damascus University, Aleppo, Teshreen, Al-Baath and Al- Furat) and two private Syrian universities (University of Kalamoon and Private Syrian University) have medical faculties. The current security instability has affected directly the performance of six medical faculties (Al- Furat University, Aleppo University, Al-Baath University, University of Kalamoon, Syrian Private University and Al-Andalus) and indirectly, the rest of medical faculties (Damascus and Teshreen Universities), which are burdened by hosting students from the faculties of affected governorates, that are outside the control of the government.

About ten questions, which were suggested by Harden in 1986 [12], has to be asked in order to set valid, reliable, and relevant national exams that can assess the quality of programs and students during the Syrian crisis as follows:

1. What are the needs of the community?
2. What are the aims and objectives?
3. What content should be included?
4. How should the content be organised?
5. What educational strategies should be used?
6. What teaching methods should be used?
7. How should the details of the curriculum be communicated?
8. What educational environment or climate should be fostered?
9. How should assessment be carried out?
10. How should the process be managed?

### *4.1 What Are the Needs of the Community?*

Syria experiences the burden of several chronic diseases with no or limited data estimating the exact prevalence, incidence, and risk factors. Previous research did not indicate a decrease in the prevalence of disease, despite an enormous increase in the number of health staff distributed in Syria [13]. Facilities are allocated to curative health care with little improvement in health of the population and ignorance of integral aspects of health promotion and disease prevention. A recent study reported an increase of the number of Syrian outpatients attending psychiatric clinic, with somatic symptoms and related disorders during the Syrian crisis [14]. In addition, the severity and the type of psychiatric disorders, numbers of inpatient cases with psychiatric emergencies have also risen during the Syrian crisis with no exact data estimating the

real problem [14]. Findings of studies investigating attitudes of students, graduates, patients, and stakeholders towards the curriculum and health care delivered have provided evidence that Syrian graduates lack some essential skills [15]. Moreover, Latifeh and Dashash [14] have demonstrated, in their critical analysis of Syrian psychiatric curricula, that Syrian society is in critical need for young medical doctors, who are specifically trained to handle psychiatric complex situations and who are culturally attuned to their requirements, problems of peace, and human rights [14].

They have also suggested a new psychiatric curriculum and training that need to be delivered in order to produce health professionals who are able to provide psychological first aid, problem-solving counseling, relaxation training, and manage acute behavioral emergencies [14].

This would be of critical importance to design community-based and culturally sensitive and recovery-oriented programs that can promote mental health and psychosocial wellbeing of people affected by the crisis [5].

The focus in the curriculum on health rather than disease demands a focus on people in the community as individuals with rights and needs in which physical, psychological, and social well-being of people are emphasized [5].

## *4.2 What Are the Aims and Objectives?*

The varying health needs in Syria necessitate the development of a new curriculum in which community health needs, and socio-cultural aspects of health and disease can be emphasized. The aim of the new curriculum is to produce graduates who are committed to personal development and are able to practice evidence-based health profession in the community. The education should focus on the learning outcomes that students will achieve at the end of the course.

The process does not mean increasing “musts” and “should” facing curriculum planners [15] but it means creating a framework for medical education, which takes students through several learning activities in order to reach the defined competencies.

Thus, the emphasis should not be only on what the graduate is able to do ‘doing the right thing’, nor on how the graduate approaches his/her practice ‘doing the thing right’, but is also on how to prepare the graduate to be a professional ‘the right person doing it’ [16]. This would produce more health professionals who can apply the principles, policies, and strategies of the WHO and achieve good health for all.

## *4.3 What Content Should Be Included?*

The Syrian crisis, which has been ongoing for 7 years, has led to a large negative impact on all aspects of life. The current curriculum provides students with all related theoretical knowledge and clinical skills. However, the curriculum does not

develop other important intellectual, transferable, and general skills such as critical thinking and communication [15]. Graduate should have essential theoretical and clinical knowledge to be able to evaluate the evidence, should be able to communicate effectively, able to practice safely and ethically, able to solve clinical problems, should be able to use and apply all new information technologies to develop the role of health professional within the community [15].

This would educate health professionals to fulfill the responsibility of the current situation and to provide safe and quality care to patients in need.

## *4.4 How Should the Content Be Organised?*

Syrians experience a wide range of health problems caused by conflict and related violence, displacement and multiple losses, as well as issues related to movement to more settled areas [17]. There is a critical need for young medical doctors who have been specifically trained to handle complex situations and who, are culturally attuned to their requirements, problems of peace, and human rights [18, 19]. New curricula should be adopted in which medical students should be trained to inculcate the values and attitudes that foster tolerance, create respect for cultural, ethnic and religious diversity as well as human rights, and encourage peace. They should be educated about common health problems and related conditions and have strategies to manage the symptoms and provide trauma-focused therapy [19].

## *4.5 What Educational Strategies Should Be Used?*

Medical faculties follow a traditional approach. The curriculum is over-crowded and fragmented because of the continuous addition of new topics. There is a need for an alternative approach to a traditional curriculum with its teacher-centred, information gathering, discipline-based, hospital-based, standardized programme and its opportunistic, apprenticeship-based learning [20].

The role of medical students should be reinforced during the Syrian crisis to improve the learning environment for the student attainment of better knowledge and clinical skills.

The application of SPICES model of educational strategies can solve several problems. In this, the student is independent, a lifelong learner, and is aware of essential knowledge and skills needed before graduation. The breadth and depth of learning can be improved since the emphasis is on problem-solving rather than information gathering. Student-centred learning can be promoted by the use of study guides or structured logbooks. These resources can direct students to learning outcomes related to the clinical problems being seen. Students can gain a sense of progress in their learning and become more motivated when they take control of their learning (adult learning theory). This would be very helpful for building present

learning skills and for enhancing future intellectual commitment [21]. The interprofessional collaboration and the delivery of health care, in hospital and community, should be enforced in order to help graduate to further serve the community after graduation.

Furthermore, several specializations that are currently emerging could integrated into current curricula. For instance, Latifeh and Dashash [1414] have addressed the importance of promoting a culture of mental health through further integrating psychiatry into medical curricula. Post-traumatic Stress Disorder (PTSD) modules could be included in existing courses. Prosthetic or rehabilitation services could appear as a module in the course and could be mounted to address targeted problems related to consequences of the crisis [14].

## *4.6 What Teaching Methods Should Be Used?*

Adopting principles of teaching and learning are essential for effective quality education. Learning and teaching are a cooperative effort [21]. It is the joint responsibility of student and teacher. Large-group teaching through lectures is still the only available methods during the present crisis. Small-group teaching is available in clinics. Discussion is hardly ever offered. However, the Syrian crisis has helped teachers and students to contribute together and demonstrate their commitment to learning from each other. Teachers have understood, to some extent, that teaching is not about transmitting information but also about facilitating learning and that learning is not about having knowledge and understanding of the topic, but rather it is about recognizing and supporting the learner intellectually, emotionally, socially, ethically, spiritually, and also physically [21].

## *4.7 How Should the Details of the Curriculum Be Communicated?*

A number of decrees and decisions have been issued during the Syrian crisis to facilitate the transfer of students between universities and to facilitate the adoption of one educational strategy in similar specializations.

In addition, several instructions and clarifications have been issued to assist teachers to develop their teaching, learning, and assessment in the light of the current needs.

Guidebooks, which contained the whole picture of different elements of the curriculum were published and distributed. They include aims, objectives, and intended learning outcomes (ILOs) of programs at subject, year, and program level in all universities. The aim was to provide the student with the opportunity to know the basic skills that must be mastered before graduation in the event that some of the courses or topics were reduced or omitted by some academic staff.

## 4.8 What Educational Environment or Climate Should Be Fostered?

New trends in medical education have focused on enhancing learner-teacher partnership in which both student and teacher share accountability for the outcome. It is essential to understand the learner, the learning process and to provide the learner with supportive but challenging environment.

Concerns have been expressed in the MoHE regarding the deterioration of the educational environment because of the current situation in Syria. Most students have experienced high levels of emotional disturbance and psychological problems that have great influence on their future competencies.

Clearly, the educational environment is also a crucial element that determines whether the planned curriculum is delivered successfully as it reflects how, why, and what students learn [22]. Understanding strengths and weaknesses of the learner, allowing opportunities for learning and providing different learning activities, are all key factors for effective education [23].

During the crisis, the educational environment has played a crucial role in student retention, productivity, and performance. It has a great impact on student performance and outcomes as well as having influenced their behaviour, attitude, and values. Positive discussion with students about their daily challenges and difficulties, finding solutions for their problems and providing them with essential academic advice and educational help had significant impacts on their performance and wellbeing.

## 4.9 How Should Assessment Be Carried Out?

Several assessment methods have been implemented, in each department, in order to assess theoretical knowledge and clinical skills of students during their studies. As previously mentioned, the MoHE has been unable to follow up institutions to undertake regular evaluations, to perform auditing of programs, to evaluate programs and curricula that were previously planned, or to make sure that accreditation rules are being applied. Therefore, it was essential, during the Syrian crisis, to assess graduate at a national level to determine whether they have acquired the essential skills before graduation. Moreover, it was of critical importance to develop a standardized tool for measuring and assessing competencies of Syrian medical graduates from public and private faculties.

## 4.10 How Should the Process Be Managed?

Significant difficulties related to assessing the performance of students in Syrian universities have been raised, during the current Syrian crisis, because of financial restrains, lack of qualified available human resources in assessment and evaluation,

increasing workload and change of educational environment. This has negatively affected the maintenance of secure examinations and the implementation of valid and reliable assessment methods.

As mentioned before, the MoHE, has to follow a top-down approach through establishing the CME in order to measure the output of the universities before graduation and also to maintain the reputation of the "Syrian certificate" and recognition by international bodies. The CME has to follow restricted methodology in order to design a standardized unified tool that can measure the quality of the output precisely and easily.

## 5 Implementation of the Unified Exam at National Level

A unified national exam (UNE) as a standardized tool, which has been designed by the CME, has been applied at a national level in medicine (UNME), dentistry (UNDE), pharmacy (UNPE) and nursing (UNNE) to assess the competencies of students and to provide universities with relevant information needed for evaluating and improving their curricula. This has been extremely vital during the crisis because of its impact on graduates competency, curriculum quality, institution recognition, university reputation, community satisfaction, and the entire nation. The methodology of the UNME application will be presented in this chapter since it has been applied first and the experience related to its implementation for medical graduates has exceeded 7 years when compared with other UNEs, which has been applied for other health faculties (pharmacy, dentistry and nursing) in the last 3 years.

### *5.1 The UNME Methodology*

All Syrian graduates from both public and private universities must pass successfully the clinical examinations in their faculty and be nominated by their universities to be eligible to set the UNME. They should, then, pass the UNME and obtain 60/100 marks in order to be able to have their graduate certificates from their faculties, to practice, and be able to apply for a residency or medical specializations programs in Syria. In addition, the UNME has been an "equivalence examination" for medical graduates who obtained specialty certificates from Non-Syrian Universities and wish to practice in Syria.

Graduates should fulfill the requirements of the current situation taking into consideration challenges faced by inadequate number of qualified nurses and allied health professionals, deterioration in the functionality of medical equipment, and shortages of drugs and medical supplies due to sanctions [19].

## *5.2 Identifying Essential Competencies*

The UNME is designed to make sure that the learning outcomes have been achieved so graduates can provide safe and high-quality health care to patients. Therefore, it has been very important to identify firstly a preliminary list containing essential competencies that are essential to produce a competent, socially sensitive practitioner, who adheres to the highest standards of professionalism and can effectively improve health care in society. Dental textbooks, journals and databases in the last 10 years were searched in order to be familiar with new trends in health profession and to identify changes in the concept and techniques being taught to students [24].

In addition, 15 star performer students were also invited for in depth interview to recount the most critical situation they had faced in their clinical practice, to describe situations, reasons, people involved, and attitudes. At the end of the interview, students were asked to define essential characteristics and attitudes that they think the graduate should possess in order to be a good health professional. The same procedures were repeated with average performers. The analysis was undertaken in order to identify behaviours, skills, and characteristics that can distinguish the good from the average students. This investigation was so helpful in identifying areas requiring special attention in early years of practice. For instance, graduates reported that emergency topics were not adequately covered in the curriculum. They reported lack of confidence in providing emergency care in clinical setting, lack of sufficient knowledge in systemic diseases, and laboratories investigations.

Another helpful approach, which was performed in order to predict performance in health professionals, was through investigating patient satisfaction towards clinical management provided by graduates, and also to ask patients to report incidents that happened to them or they observed.

The Delphi technique, which has been described as a successful technique for identifying professional behavior or competence, was selected to seek a final consensus on learning outcomes [25–27]. Thirty medical experts who demonstrate knowledge, clinical and teaching experience and who make active contribution in medical education and clinical practices during the Syrian crisis, were individually invited to identify competencies for safe professional practice and to fill the designed questionnaire. They were asked to classify each item into essential or not essential. They were asked to send the response to the CME. The responses were gathered and included in the final list. The list was sent again to all experts to ask them to read each competency and indicate beside each one using a five point scale, how essential the competency would be, in order to produce competent doctors (not essential=1, perhaps useful=2, useful=3, important=4, essential=5). The weighted response for each competency was calculated. The ratings were analyzed and the findings indicated the principal competencies necessary for the doctor during the Syrian crisis.

All information and data collected, from the above approaches and studies, were organized into a preliminary list of competencies, which represent the specific knowledge, skills and attitudes needed in Internal Medicine, Pediatrics, Surgery, Gynecology and Obstetrics, Ear Nose and Throat, and Ophthalmology.

### *5.3 UNME Questions*

When there is a large body of materials and outcomes to be tested and when there are a large number of students to be assessed, it is recommended that the content of the UNME should be specifically planned against learning objectives. The process is known as blueprinting in which students learning matches the eventual assessment [28].

Many efforts have been undertaken to make the UNME a valid and reliable test. It is developed based on its content to maintain its integrity, transparency, and to make sure that the test's consistency is achieved over a period. A test blueprint, which specifies domain areas are formulated in which learning outcomes, essential knowledge and skills needed for practice, in normal and emergency situations, are specified [28].

The UNME questions are designed to measure the facts. Questions should be well structured, of good quality, and of appropriate difficulty levels. They should assess essential, important frequent aspects in medicine and should be relevant to society during the Syrian crisis.

Accordingly, the UNME is a 2-day written exam which is organized biannually (basic and complementary for failing students) and made up of 240 various individual multiple-choice questions MCQs, with five option, in internal medicine (72 questions), pediatrics (36 questions), dermatology (12 questions), ear, nose and throat ENT (12 questions), ophthalmology (12 questions), surgery (48 questions), and gynecology and obstetrics (48 questions). Only one of the options is the correct answer to the question posed in the exam.

Multiple-choice questions (MCQs) test, which have been suggested to test several outcomes in a short period at low cost [28], can also test knowledge of facts, terminology, specific principles, procedures, understanding, and application of facts and principles. Bloom identified six levels within the cognitive domain from the lowest level of knowledge through comprehension, application, analysis, synthesis, and evaluation [28]. Usually, most items test the lower levels of the cognitive domain such as recall and recognition. Recently, items that test higher-order cognitive objectives such as understanding, application and problem solving, have been developed in the UNME exam. Figures 3 and 4 show the number of items designed in internal medicine specialties in the UNMEs held in 2012 and 2017 that test knowledge, clinical application, or clinical problem-solving skills. See the increased number of items that test higher levels of the cognitive domain in the UNME held in 2017 when compared with that in 2012.

The 7- year experience with the implementation of the UNME has demonstrated that the exam has added a great value to medical education in Syria between 2012 and 2017 and has a great contribution in bridging the gap caused by a severe shortage of health professionals.

The process that includes designing the UNME questions, running and scoring methodologically, analyzing the results and distributing evaluation report about ranking of educational programs, in a secure transparent systematic approach, has greatly provided validity of the test and a meaning for implementing it.

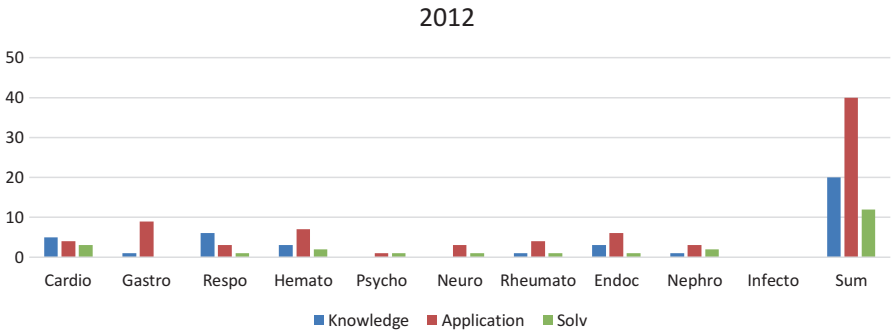


**Fig. 3** Number of items classified according to the level of cognitive domain (2012)

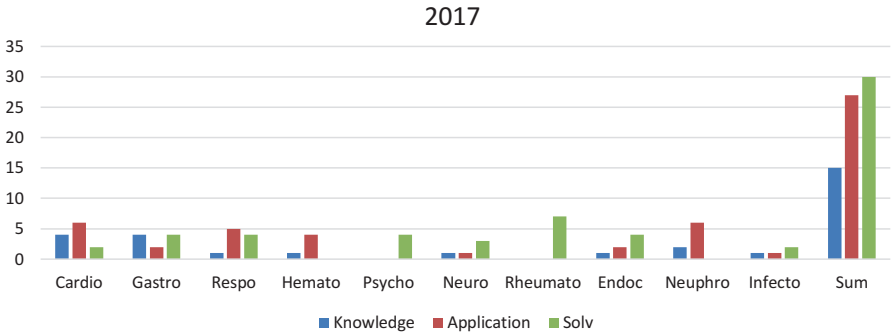


**Fig. 4** Number of items classified according to the level of cognitive domain (2017)

Table 1 summarizes the number of medical students attending the UNME essential course (not complimentary for resetting students) in all Syrian universities between 2012 and 2017 with their success rates.

The UNME has achieved its goal in fulfilling the requirements of the current demanding situation through evaluating the quality of graduates, programs, and universities. It also creates competition, and provides students with a feedback on strengths and weakness of their knowledge and skills before graduation. It helps the comparison between the student with his/her peers in the program at the same university, and programs in other Syrian universities. It also encourages universities to implement better teaching methods, and enhances the capacity of remaining academic members despite the current situation. Figure 5 shows the ranking of Syrian medical faculties in the UNME held in 2017, according to the performance of their graduates in internal medicine specialties (internal medicine, dermatology, surgery, gynecology and obstetrics, ENT, ophthalmology, and pediatrics).

Taking into consideration the program objectives, the CME has to document the rationale for selecting questions. The current situation demands producing graduates who are able to prevent communicable diseases, provide primary health care, and offer first aid to all injured patients affected by infectious diseases, violence, missiles, explosions, head injuries, and abdominal wounds [29].

**Table 1** The number of medical students from Syrian and non-Syrian universities attending the UNME between 2012 and 2017 with the success rates

| University | Number of attendees | Number (%) of graduates | Number of attendees | Number (%) of graduates | Number of attendees | Number (%) of graduates | Number of attendees | Number (%) of graduates | Number of attendees | Number (%) of graduates | Number of attendees | Number (%) of graduates |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | |
| DU | 444 | 415 (93.46%) | 606 | 531 (87.62%) | 449 | 397 (88.41%) | 513 | 476 (92.78%) | 613 | 578 (94.29%) | 792 | 659 (83.21%) |
| AU | 438 | 395 (82.2%) | 502 | 370 (73.70%) | 339 | 256 (75.51%) | 377 | 307 (81.43%) | 361 | 327 (90.58%) | 382 | 307 (80.37%) |
| TU | 266 | 228 (85.7%) | 296 | 244 (82.43%) | 216 | 183 (84.72%) | 325 | 300 (92.30%) | 427 | 392 (91.8%) | 448 | 360 (80.36%) |
| ABU | 185 | 132 (71.4%) | 256 | 150 (56.64%) | 192 | 125 (65.10%) | 195 | 154 (78.97%) | 212 | 192 (90.56%) | 191 | 139 (72.77%) |
| AFU | 143 | 112 (78.3%) | 167 | 88 (52.69%) | 171 | 98 (57.30%) | 137 | 79 (57.66%) | 128 | 108 (78.12%) | 31 | 9 (29.03%) |
| UOK | 152 | 93 (61.18%) | 203 | 99 (48.76%) | 177 | 88 (49.71%) | 177 | 99 (55.93%) | 61 | 32 (52.45%) | 60 | 30 (50%) |
| SPU | 97 | 62 (63.9%) | 116 | 45 (38.79%) | 115 | 69 (60%) | 126 | 88 (69.84%) | 66 | 49 (74.24%) | 51 | 29 (56.86%) |
| ANDU[a] | – | – | – | – | – | – | – | – | – | – | 20 | 11(55%) |
| N-SU | 238 | 30 (12.6%) | 101 | 13 (12.87%) | 99 | 22 (22.22%) | 56 | 13 (23.21) | 47 | 8 (17.02%) | 46 | 7 (15.22%) |
| Total | 1963 | 1467 (74.7%) | 2247 | 1540 (68.5%) | 1758 | 1238 (70.4%) | 1906 | 1516 (79.5%) | 1915 | 1686 (73.6%) | 2021 | 1551 (58.1%) |

Data reported for essential course (not complimentary course for resetting students) in which students attended for the first time)

*DU* Damascus University, *AU* Aleppo University, *TU* Teshreen University, *ABU* Albaath, *AFU* Al-Furat University, *UOK* University of Kalamoon, *SPU* Syrian Private University, *ANDU* Al-Andaluss University, *NSU* Non-Syrian Universities

[a]ANDU is a private recent university and the first year graduation for its medical students was in 2017

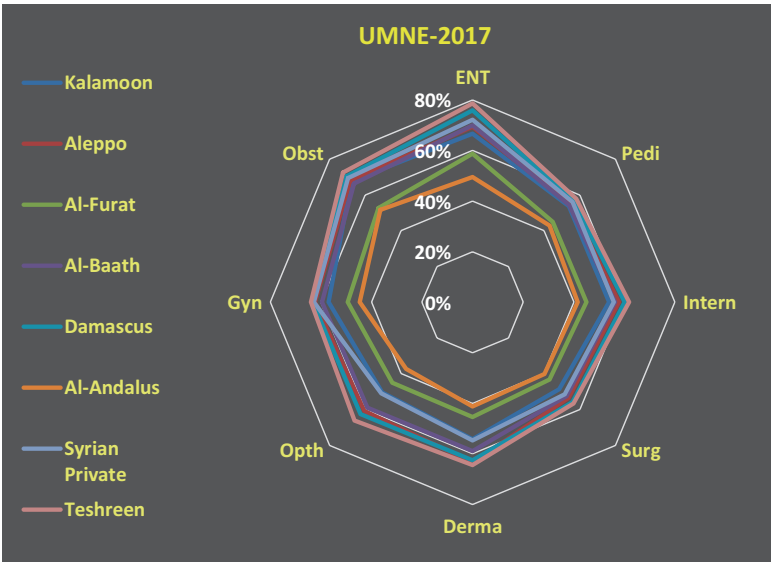


**Fig. 5** The ranking of Syrian medical faculties in the UNME held in 2017, according to the performance of their graduates in internal medicine specialties (*Pedi* Pediatrics, *Inter* internal medicine, *Surg* Surgery, *Derm* Dermatology, *Opth* Ophthalmology, *Gyn* Gynecology, *Obst* Obstetrics, and *ENT* ear, nose and throat)

The CME has also considered categories in designing the UNME and precisely specifies the proportions of items in each category. In this regard, the following four domains have been considered in the UNME:

- Etiology: distinguish between different diseases by tissue involved and etiological factors.
- Diagnosis and assessment: assess the situation of the patients and provide systematic examination.
- Management and treatment: provide the best optimal health care to patients.
- Prognosis: appropriately deal with the consequences and complications of diseases.

The CME has to emphasise the importance of assessing the knowledge and skills in these four domains despite the facts that academic members mainly consider in their teaching aetiology and diagnosis domains rather than **treatment** or **prognosis,** which are usually covered in depth during postgraduate training.

In fact, the shortage of health professionals during the crisis has enforced the CME to address the importance of preparing undergraduate medical students for dealing and managing some specialised complex cases that recently emerged. Figure 6 shows that the UNME held in 2017 has increased number of items that deal with treatment and prognosis in internal medicine (cardiovascular, gastrointestinal, respiratory, hematological, psychological, neurological, rheumatology, endocrinology, nephrology, and infectious diseases).

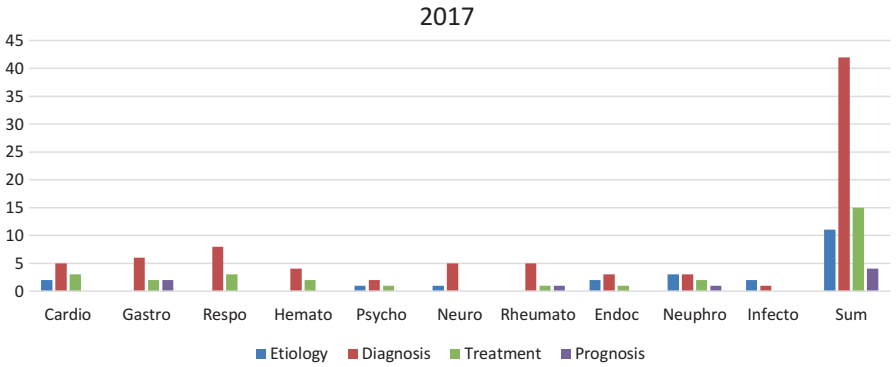


**Fig. 6** The number of items in each category (etiology, diagnosis, treatment, and prognosis) in internal medicine specialties in the UNME held in 2017

The CME has to publish the key content areas and the instructional objectives of the UNME to reflect the achievement of students and assure the content validity of the exam (http://newcme-edu.net/ReadNews.aspx?NewsID=16).

In addition, the CME has to design and distribute a table of specifications to help academic members consider, in a systematic manner, the learning objectives that should be covered in their teaching. This has been a driving tool for medical faculties to improve their medical curricula and equip their undergraduate students with proper knowledge and skills [30]. In addition, the table of specifications has formed the basis for designing the UNME on factual, concept, and procedural knowledge of the management of several complex and emergency cases.

## 6 Conclusion

The UNME has been a bright spot in the history of the CME during the Syrian crisis, as it proved a success for its validity, reliability, integrity, transparency, and ability to stimulate students, teachers, and universities despite the circumstances. Asking experts to critically review the UNME questions together with the intended learning outcome has greatly improved its validity [31].

The future domains of the UNME will be community-oriented and will further consider testing the knowledge and skills of graduates about new other topics that recently emerged such as nutritional support, food-borne diseases, mental health services, hearing impairment, as well as reconstructive, prosthetic, and rehabilitation services [6].

With high expectations placed upon the UNME, a high level of pressure is placed upon the CME. With limited resources and facilities, there is a need for ongoing support from decision makers in universities to improve their curricula and make it relevant to community needs so they can decrease the burden on education and health systems in Syria. In addition, there is a need to promote students-centered approach in which students is responsible for their learning.

Each experience has challenges, difficulties, and limitations. However, the UNME, which was adopted by the MoHE and applied by the CME during the crisis, has demonstrated its effectiveness in maintaining the minimum level of education in crisis despite the obstacles, compounded by the lack of funding and human resources. This experience could be implemented in countries suffering from conflict and war as an approach towards meeting population needs and delivering the optimal health care to society.

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