

Promoting the Knowledge Economy in the Arab World

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Abstract

This article looks at the information and communication technology (ICT)–related education reform programs in three countries in the Middle East. It indicates the evident policy linkage between the implementation of school-based ICT programs and the development of pupils' 21st-century skills to address the knowledge economy. The policy aspirations are put in the context of the history of education in the region and the Islamic traditions and beliefs about the nature of knowledge. The impact of the reforms is evaluated on the basis of realities of day-to-day life in schools as reported by independent inspection, review, and evaluation agencies. It concludes that much deeper institutional reform is necessary to fulfill the policy aspirations rather than speculating over progress through technology-enriched futures.

Keywords

curriculum, education, educational administration, leadership, policy, educational research, information technology, international education, schools, science, math, technology, teaching

Introduction

The three countries in this account—Bahrain, Jordan, and the United Arab Emirates (UAE)—have embarked on school reforms that aim to promote the better use of information and communication technology (ICT) for teaching and learning. Several commentators have pointed out that these policy drives have tended to share common ambitions, that is, to promote ICT skills and competencies across school curricula, to develop e-Learning in and out of the classroom, and to support learners to develop the skills necessary for them to be successful participants in the knowledge economy, both as future employees and citizens (Dale, 2000; Kozma, 2005; Rizvi & Lingard, 2010; Robertson, 2005). This article seeks, in particular, to identify the difficulties associated with the realization of the last of these aspirations, namely, the development of “knowledge economy skills,” within the context of societies and education systems that have different understandings about the definition, the nature, and the potency of knowledge.

The linkage between ICT and “knowledge economy skills” is implicit in the curriculum reform policies of the three countries in the study. This is in keeping with much of the educational discourse of the past decade where the successful implementation of ICT across the curriculum in schools is seen by governments, in both developed and developing nations, as a key element in modernization and reform. Even within the limited education budgets of countries with emergent economies, there has been a significant investment in computers in schools, in the belief that the machines will serve

to transform what and how teachers teach and learners learn and therefore transform the economic, cultural, and societal bases of nations as they progress into the 21st century (El-Tawila, Lloyd, Mensch, Wassef, & Gamal, 2000; Kozma, 2005). The implementation of educational reforms related to technology is therefore a global policy concern for contemporary times (Ball, 1998; Gabbard, 2008; Organisation for Economic Co-Operation and Development [OECD], 2010). The apparent discrepancy between the policy aspirations connected with ICT curriculum reform programs and their realization on a day-to-day basis in school classrooms provides the central focus of this article.

The Historical Context and Beliefs About the Nature of Education and Knowledge

The Arabs have an established education tradition going back at least 1,300 years. Its origins run parallel to the revelation of the Holy Qur'an to the Prophet Mohammed and the subsequent dissemination of the Islamic faith. As a consequence of its close association with divine revelation to

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the Prophet, the foundations of education in the Arab world are very different from those from the liberal Western Socratic pedagogic tradition where the acquisition and development of knowledge is built on questioning and underpinned with intellectual freedoms (O-Hear, 1982).

In the 100 years immediately after the death of the Prophet, the rapid development of Muslim Arabic civilization brought it into close contact with Greek, Egyptian, Persian, Syrian, and Indian cultures, and certain elements of these faiths came to be reflected in Islamic thought (Fakhry, 1997). At this time, there was a recognition of the Aristotelian tradition of the pursuit of truth with the help of human reason. In this sense, three distinct forms of knowledge were defined as developing over this period: The first—*al-bayan*—was textually based and relied on the foundational texts of Islam taken from the Qur'an and from the sayings of the Prophet. This form of textual analysis, with an emphasis on language and grammar, is a fixed form, as it is only derived by interpreting and reinterpreting a fixed body of work. The second form—*al-irfan*—is a mystical knowledge that derives from a spiritually inspired inner state; this form of knowledge embraces all the esoteric branches of Islam—Sufism and Shiism; the form is claimed to originate from Eastern mystical traditions that predated Islam and includes astrology, alchemy, and numerology, and created a universe of symbols and allusions. It feeds and informs the aesthetic and cultural elements of Islam, but it resides in the realms of the imagination rather than rooted in the material world. The third form of knowledge, or *al-burhan*, is based on causality and thus allows for the development of a rationality based upon natural laws. This form of knowledge was capable of evolving into an Islamic form of modern rationality, but it was held in low regard by the mainstream philosophers as it derived from the Western fringes of Islam in the Maghreb and in Andalusia rather than the Eastern tradition, associated with the birthplace of the Prophet Mohammed (Al-Jabir, 2006).

In the subsequent centuries, Islam was disseminated throughout the Middle East and North Africa through a network of privately supported religious institutions developed to promote the new religion. Education took place in the madrasahs, which were closely associated with the mosques, and in kuttabs, where students learned reading, writing, and the rudiments of religion. These traditional places of learning played the role of elementary schools and in the more isolated parts of the Arabic-speaking world still continue to this day (El-Sanabary, 1992).

By the 11th century, a tension had developed between the more rationalist philosophy of the Mu'tazilites (such as Abu Nasr al-Farabi [870-950] and al-Razi ibn Sina [980-1037], more widely known as Avicenna) and the more conservative Salafist believers. Al Farabi, for example, designed a school curriculum that stressed the importance of the natural sciences, the exploration of the nature and characteristics of elements in the material world, and the development of

metaphysics to foster abstract thinking to help learners to understand the essence of being and begin to comprehend the nature of God (Gunther, 2010). By contrast, Abu Hamid al-Ghazali (1058-1111) reasserted the dominance of religion over reason. He was the headteacher of the influential Madrasah Nizamiyyah in Baghdad in 1067. Its founding marked the beginning of a sectarian system of education with a strong political bias. One of its main functions was to root in the public psyche the fundamentals of Sunni Islamic orthodoxy and to marginalize the more mystical Shia branch. However, the division between the traditionalist teaching rooted in the Qur'an and the transcendental spiritualism was not clear-cut. Al-Ghazali combined rationalism, mysticism, and orthodox belief in a way which is still evident today among many practitioners. Al-Ghazali believed that reason and the senses allow humans to acquire knowledge of the visible material world, whereas revelation and inspiration permit them to discover the invisible spiritual world. Through perpetual learning and spiritual exercise, humans attain "true" knowledge and become capable of comprehending aspects of the realm of the Divine. Al-Ghazali dissuaded students and teachers from pursuing the natural sciences, especially those that, in his view, contradicted religion (Al-Ghazali, 1963).

Al-Ghazali was highly influential in the development of the Sunni strand of the Islamic faith. He attacked the use of rational Hellenistic philosophy in the context of religious belief and rejected rationalism or rational scientific enquiry as a basis for promoting wisdom and knowledge. Some commentators (Alawi, 2009) claim that this rejection of philosophical rational enquiry by Al-Ghazali is one of the most significant reasons why Islamic civilization failed to embrace modernity. By rejecting rationalism and undervaluing creativity and inspirational strands of thinking, the mainstream systems of knowledge fell back on the early texts as the only true knowledge—*al-bayan*—and the features of the more rationalist empirical forms were rejected, later to be subsumed into European thinking. Post Reformation and Enlightenment, European thinking succeeded in transcending the limitations imposed by religious dogma and enabled the development of science and technology-based rationalist discourse, which was a systematic break from the past. Meanwhile, the core beliefs and Islamic knowledge systems continue to revolve around the fixed body of text-based material that is fixed and immutable.

By the 16th century, the Ottoman Empire assumed control over the Arab world. Though they were effective military and administrative practitioners, they showed little interest in broadening the education of the Arab peoples, whom they regarded as subjects; they were instead content to erect a wall of religious orthodoxy between Islam and the West. For the Ottomans, the state took care of administration and economic and military affairs, with the religious institutions addressing themselves to doctrine, law, social relationships, and intellectual life, including education. Within this context,

education stagnated with the kuttabs and the mosques having responsibility for education centering on a notion of education as means of perpetuating traditions and acquiring knowledge rather than a mind-broadening process (Kittrie, 1989).

Education in Bahrain, Jordan, and the UAE

From the time of their independence from colonial rule in the early 1970s, the countries in the Gulf used syllabi, which were largely derived for those in Kuwait. By 1983, the six wealthy lower Gulf states—Kuwait, Oman, Saudi Arabia, Bahrain, UAE, and Qatar—had formed themselves into the Gulf Co-Operation Council (GCC), and these GCC countries agreed to adopt unified curricula for mathematics and science for Grades 1 to 9 under the supervision of the Arab Bureau for Education in the Gulf States (ABEGS). Additional curricula were later developed with text books being produced for social studies and Arabic, which had a common core but with individual local elements for each of the six member states (United Nations Educational, Scientific, and Cultural Organization—International Bureau of Education [UNESCO-IBE], 2006).

Owing to their common heritage, and despite the geographical distance between the Gulf states and the north of the peninsula, the education system in Jordan and that of Bahrain and the UAE have many similarities as follows:

- the segregation of boy and girl students from the age of 6 and their education in separate schools;
- the gender segregation of staff according to the gender of the students in intermediate and secondary schools;
- a prescriptive national curriculum coupled with specified timings for all the lessons;
- the prominence of Islamic education, not only as a subject but also as a philosophy to be maintained across the curriculum;
- the division of the students into science, arts, or vocational streams for their secondary education from the age of 16;
- the policy of grade retention and repetition for students who do not pass the annual assessment examinations at the end of each school grade;
- the schools' common management structure consisting of a principal, vice or assistant principal, and a social worker as part of the senior management team; and
- the absence of any degree of local school autonomy.

The Knowledge Economy in the 21st century

It is within this context of centrally managed and controlled education systems with prescriptive national curricula, and

an absence of local school autonomy and decision making that considerations of the knowledge economy must be placed.

Through his book *The Coming of the Post-Industrial Society: A Venture in Social Forecasting*, Daniel Bell (1973) is widely credited with formulating many of the ideas relating to the development of the knowledge economy. In the field of education, the term is often used to describe a utilitarian/neoliberal view, which sees education's role as developing human capital as well as the more idealistic emancipatory view of education as a vehicle through which individuals achieve self-realization and develop independent skills and the love of learning for life. The use of the term *knowledge economy* is now so commonplace, in both the mass media and among policy makers at all levels of government and intergovernmental organizations, that it can seldom be separated from the parallel series of arguments relating to globalization. Many of the assumptions are based on a post-Enlightenment rationalist view of education and generational knowledge transference.

In this context, so-called global "culturalists" such as John Meyer and Francisco Ramirez (Meyer, Boli, Thomas, & Ramirez, 1997; Meyer, Kamens, & Benavot, 1992; Ramirez & Boli, 1987) argue that schooling, based on a Western concept of knowledge and Western cultural ideals, is now universally evident and that this has led to a common set of educational structures and a common curriculum in many countries. This model of schooling is based on the belief in the educability of all people as an entitlement and the importance of education in maintaining economic and democratic rights. The notion that knowledge is a global public good was developed by Joseph Stiglitz (1999), former chief economist with the World Bank, and subsequent reports, for example, *Lifelong Learning for a Global Knowledge Economy* (World Bank, 2003) have reinforced the organization's perspective and their linkage of lifelong learning, the knowledge economy, and globalization.

Because it is open to so many different interpretations, the very term *knowledge economy* has become a highly contested notion. Nonetheless, the proposition by Michael Peters (2010) that there are three aspects of the knowledge economy provides a helpful summary. His article outlines these three forms and their associated discourses as "the learning economy," "the creative economy," and the "open knowledge economy."

The Learning Economy

In the learning economy, according to the OECD (1996), there is an emphasis on the importance of skills and learning, and it focuses on the need of lifelong learning as a central component in a high-skills, high-wage jobs strategy. Whereas, by contrast, Lorenz and Lundvall (2006) see the learning economy as a set of interlocking forces, including information and knowledge production, distributed social

media, computer networking, and improved connectivity each contributing toward a mode of social production that strongly emphasizes the learning processes. Lundvall distinguishes between information and knowledge: the former is logical, sequential, and easily broken down into bits and transmitted by computer whereas the latter is associated with learning that is often a form of know-how and competencies based on tacit knowledge.

The Creative Economy

In its most basic form, the creative economy represents the new formations in a postindustrial society. It has an emphasis on invention and ideas rather than in the production of tangible goods. There is a transition away for industrial production toward the generation and management of intellectual property (Florida, 2002; Howkins, 2001; Landry, 2000). The United Nations' (2008) *Creative Economy Report* views the creative economy as a new development paradigm that is able to link all aspects of the economy together in a way that provides new growth opportunities for developing countries:

A new development paradigm is emerging that links the economy and culture, embracing economic, cultural, technological and social aspects of development at both the macro and micro levels . . . the creative economy offers to developing countries a feasible option and new opportunities to leapfrog into emerging high growth areas of the world economy (p. 2).

The creative economy has a strong appeal among policy makers because they see this as a means through which new methods can be used to improve student learning in, for example, mathematics, reading, and science, and how different notions of intelligence and creativity can inform educational practice.

Openness

Openness and freedom of expression have always been central to much of the discourse about the knowledge economy. An informed and educated citizenry have been seen as prerequisites for open and democratic government. Alongside these basic principles which have been growing in strength since the 1960s, the notion of freedom of information and a citizen's right to know are concepts that began in the United States and have grown and developed there and in Europe and Australasia in the 1970s and 1980s. Much of this demand and struggle found its way into legislation designed to enable, regulate, and control public access to government records. Alongside these political dimensions of openness, over the past 10 years or so, a range of new initiatives based on the Creative Commons approach to intellectual property rights have taken root. In addition, phenomena such as Free

and Open Source Software (FOSS), Open Access, and Wikipedia have challenged certain basic neoliberal assumptions about the global network information economy. The seemingly selfless and philanthropic human motivation behind these phenomena has called into question the idea that self-interest and monetary reward are the primary drivers behind all human endeavors.

This third feature of the knowledge economy has hardly registered on the political economy of education. Benkler (2006) has theorized a new market and set of economic and social relationships as a consequence of the FOSS movement and other related phenomena. He envisions a transformed society where there is equality of access based on an equitable distribution of information goods in a networked global economy where a high value is placed on individual autonomy.

The ICT-Related Reform Programs in Bahrain, Jordan, and the UAE

The promotion of education reforms that relate to the development of 21st-century learning skills has become synonymous with the investment in ICT infrastructure in schools. In each of the countries that make up this narrative, there are initiatives that demonstrate this linkage.

The King Hamad School of the Future Project in Bahrain

Through the realization of the vision, the "Schools of the Future" project aims to provide students with the skills and behavior necessary to help to transform Bahrain into a knowledge-based economy. The project aims at providing students with enhanced education outcomes and a capacity to respond to the needs of the labor market in respect of technology, modern communications, and data management. Specifically, through the project, students will develop the following skills: self-learning, cooperative learning, interactive learning, creative skills, lifelong learning, problem-solving skills, technological understanding, and self-motivation.

The project was launched in 2005 with 11 pilot secondary schools with view to maximize the use of ICT for teaching and learning with four main components:

- Electronic classes,
- Multipurpose electronic teaching system,
- Linking schools electronically, and
- Electronic learning resources center to facilitate teacher training (so all teachers gain the International Computer Driving License [ICDL]).

By 2010, the original plan envisaged that all the schools in the Kingdom would be part of the Schools of the Future program. In practice, although all are part of the project

in name, there are wide variations in implementation and efficacy (Quality Assurance Authority for Education & Training [QAAET], 2010).

The Jordan Education Initiative

The Jordan Education Initiative was launched in June 2003 at the World Economic Forum at the Dead Sea Conference Centre. Its aim has been to improve education in Jordan through supporting the Education Reform for the Knowledge Economy project mainly through the development of Discovery Schools—about 100 schools within which

- ICT infrastructure would be upgraded,
- e-curricula would be implemented, and
- innovative staff training would take place.

New approaches to teaching and learning would take place in Discovery Schools by working with partners to accelerate the deployment of e-curricula, improving teacher ability of delivering e-content, and creating a test bed for ICT-enabled delivery of new pedagogy that facilitates learning, creativity, and innovation in Jordan. Through a “blended learning” approach, teachers were to be given the tools to integrate the use of ICTs into everyday classroom teaching so that students would have increased exposure to technologies. This has taken the form of deployment of laptops and projectors to teachers as well as other initiatives such as digital whiteboards.

Currently the 100 Discovery schools are equipped with computers, laptops, multimedia projectors, and computer labs.

The Sheikh Mohammed Bin Rasied Al Maktoum IT Education Project (ITEP) in Dubai (UAE)

The ITEP project was initiated in the year 2000 by H. H. Sheikh Mohammed Bin Rashid Al Maktoum as part of his educational strategy to create the UAE knowledge economy. At its inception in 2000, ITEP began teaching IT in schools and training teachers by providing them with a professional development program leading to a recognized international qualification in the use of ICT to promote teaching and learning. The training was mostly conducted in ITEP’s labs located in different secondary schools. The benefits to teachers were described as follows:

- Improving teaching practice,
- Developing new skills to plan and implement ICT learning programs and assess ICT learners, and
- Enhancing student capabilities and contributing to the success of the institution.

The Impact of These Curriculum Initiatives in Bahrain, Jordan, and the UAE

The impact of these initiatives can be judged, at one level, through a scrutiny of school inspection and review reports in Dubai and Bahrain (Dubai Schools Inspection Bureau [DSIB], 2010; QAAET, 2010) along with an independent impact study report commissioned by United States Agency for International Development (USAID) in Jordan, carried out by The Education Development Centre from Washington, D.C. (Light, Method, Rockman, Cressman, & Daly, 2008).

On the whole, the reports indicate that many of the far-reaching “knowledge economy” skills, which the education reform policies were seeking to promote, are underdeveloped. On the contrary, in many, or most, cases, ICT implementations have seldom moved far beyond teachers using data projectors and interactive whiteboards (IWB)—what David Buckingham terms “the wasteland of spreadsheet, file management and instrumental training that constitutes most ‘information technology’ courses in schools” (Buckingham, 2010, pp. 287-288). As such, it could be argued that Bahrain, Jordan, and the UAE are experiencing a phenomenon common to many education systems where the rhetoric of educational technology policies are simply failing to be realized on the ground. This is undoubtedly a reflection of the difficulties inherent in implementing an agenda for modernization and reform within countries which have only been free from colonial domination for a few decades.

The current state schooling in the Gulf states reflects this tension that exists between opposing views of both learning and the human condition. The debate has been joined between the traditionalists, who see education as a mechanism for transmitting core beliefs and values, and modern reform-minded politicians and policy makers, who see its role is to develop innovation and creativity within young learners. A third contemporary pressure arises from a much more utilitarian interpretation of education: a view which sees the students who are in school today as the productive elements of tomorrow’s economy. It is a symptom of globalization that the pressures for education reform are now coming not from social forces seeking Enlightenment thinking but rather from those that see the development of a knowledge economy as a substitute for oil revenues or profits from real estate (Halstead, 2004).

Teaching and Learning

The quality of teaching evident in most state schools in the region is extremely variable, frequently unsatisfactory, and seldom makes use of ICT for anything other than for classroom presentations. Even in the best schools, there is a predominant teaching style that is highly didactic and authoritarian. The contrast with the quality of teaching and learning that is taking place in the most successful private

international schools in the region is very marked. The European and American philosophies of education that have evolved over many years increasingly place students at the center of learning, with teachers as instruments to stimulate, lead, channel, and focus the learner to understand and apply knowledge in contexts which are real to them. Students are active participants in the learning process, and they are expected to be able to talk about their learning and to produce a body of written work that demonstrates their knowledge, skills, and understanding.

The methodologies present in many government schools in the region, which often trace their educational roots to older or non-European traditions, feature a much more direct approach to teaching and learning, with teachers at the center (Alexander, 2001). In this model, the students are much more passive recipients of learning and they are expected to memorize a great many facts, most of which may have little meaning in their lives. Teachers working in this mode, as transmitters of facts, are frequently dependent on a single text book to move the learning forward with little or no use of modern classroom technology. The pace, lesson content, and style are determined by the content of the text book and few, if any, other resources are used to illustrate key milestones in learning. Little or no acknowledgment is made of the different abilities or learning needs of different students, and students are not required to produce extended written work which would demonstrate their understanding or application of the knowledge.

This teacher-centered approach does nothing to develop students' deeper knowledge or understanding and to promote their capacity to operate as independent lifelong learners. However, inexperienced and insecure teachers find that the greater freedoms given to students in student-centered learning settings create situations that are harder to control. Moreover, many students, who have been unused to taking more responsibility for their own learning, often react badly to the newer classroom relationships that give them more freedom. This negative reaction is clearly unsettling to teachers, and makes them less likely to be adventurous in their teaching style and makes reform less likely.

Teachers in secondary phase schools are, in almost every case, graduates in the subjects that they are teaching, but many of them lack formal teaching qualifications. Teachers' subject knowledge is usually secure. However, in the absence of teacher training, related to how children learn, teachers usually revert to styles and modes of teaching familiar to them (i.e., when they were at school) as they are often unaware of the alternatives. As a consequence, interactions within the classroom are nearly always teacher initiated and questioning and responses are restricted to simple or one-word answers. There is seldom the opportunity for students to interact or develop arguments or themes. The classrooms allow very little scope for student-centered learning.

It's About People Not Computers

This short article has endeavored to identify the long education tradition within the Arabic-speaking world and the sophisticated definition of different forms of knowledge and learning within that tradition. From the earliest days of teaching and learning in the Islamic tradition, there has been a tension between the three forms of knowledge—*al-bayan*, a formal knowledge of received wisdom based on religious texts and immutable truths; *al-irfan*, a mystical knowledge derived from a spiritually inspired inner state, a form which resides in the imagination and the creative soul; and *al-burhan*, a knowledge based on rationality and natural laws. This tradition, which acknowledges the different forms that knowledge can take, has been contrasted with the three forms of the contemporary knowledge economy, as proposed by Michael Peters (2010). There is not a neat correspondence between Peters's three categories of the knowledge economy and the three Islamic knowledge traditions. Peters's categories derive from a model of Western Educational Enlightenment quite different from the Islamic traditions, but they have relevance in relation to the contemporary education policy aspirations.

The reforms which this study has considered are in a very early stage of implementation, and the professional development of staff is only beginning to match the deployment of ICT hardware and software. Moreover, when addressing a largely conservative constituency, which holds traditional views and expectations about the nature of schools and schooling, these far-reaching reforms will take time to have an impact at the classroom level. As such, it is probably too early to make definitive judgments about the success or otherwise of the policies. Nonetheless, there exists, in the public domain, a large body of evidence which suggests that, at present, little has changed in respect to the modalities of teaching and learning in most classrooms in the government schools in the countries which are the focus of this narrative.

Almost without exception, ICT and curriculum reform programs in education systems across the world have been hardware led. That is to say, the computers, the software, and the networking have preceded, by a long way, the training and professional development necessary to make best use of the technologies. Even then, the training that has taken place has frequently been of a wholly mechanistic type designed to optimize operation of the equipment rather than to promote new ways of organizing the use and distribution of technology in schools and the ways in which students have access to the technology. Another frequently reported feature from classroom observation is the lack of student autonomy and the rigid teacher direction evident in most classroom settings where ICT is being used. This approach is diametrically opposed to the sort of independence and strong self-motivational skills which are part of every discourse about 21st-century skills.

From the evidence available to date, there is a paradox that, as Lingard (Rizvi & Lingard, 2010) and others (Hartley, 2003; Ranson, 2003) have observed, the type of pedagogy needed to achieve the creativity and original thinking associated with the knowledge economy is not being produced by the education ICT policies as currently implemented. It is clear that much deeper institutional reform and more rigorous analysis of current practice rather than speculating about technology-enriched educational futures is necessary for this to happen (Selwyn, 2010).

The analysis needs to focus primarily on the nature and content of the programs of professional development for teachers. Teachers need to see better models of how innovative teaching and learning can be promoted through the appropriate use of technology.

Numerous studies to date have highlighted the very patchy and frequently unsatisfactory way in which the considerable investment in ICT by governments across the world is impacting the classroom practice (Cuban, 2001; Kozma, 2003; Selwyn, 2010). Perhaps the best hope for a future lies in the international Innovative Teaching and Learning research programs that are currently being conducted under the aegis of Microsoft. If the findings from this research are able to identify best practices that can be replicated in different settings, then educationalists can begin to be satisfied that computers in the classroom are not just “oversold and underused” (Cuban, 2001).

Notwithstanding this global perspective, governments in the Arabic-speaking world need to be confident about the sort of knowledge economy that they are seeking to promote. As Peters’ overview of the three forms of the knowledge economy implies, much deeper structural reform of curricula and pedagogies must happen if these countries are to realize their aspirations of an economic future as part of the global knowledge economy.

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Bio

Michael Lightfoot is an international education consultant, currently working as head of quality assurance at Bahrain Teachers College. He has held senior positions with government agencies in Bahrain and Dubai, as well as being a policy adviser to the Jordan Education Initiative. He has extensive experience of educational ICT and curriculum reform programs in Central Asia and the Commonwealth of Independent States. He is a doctoral candidate at The London Knowledge Lab.