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Foreword

In October 2018, Carnegie published a report calling for fundamental educational reform in the Arab world and arguing for the need for that reform to move "from schooling to learning" in order to "serve the needs of pluralistic societies and foster the development of active, responsible citizens who are empowered to deal with complexity and advance constructive change."[1] The report gave a number of recommendations encompassing the different fields within which education takes place: the school, the state, and the society at large.

This paper, with many of the authors of the first report participating again, attempts to go in further depth about the findings of the first report. It is evident that Arab governments still see education reform as a top-down effort that continues to perpetuate power relations and authoritarian thinking, sidelining critical and creative thinking among students. The paper places special emphasis on several reform efforts that are being implemented across the Arab region, many in a bottom-up approach that attempts a collaborative approach with governments but is not held hostage to old authoritarian thinking. Rather than simply admiring the problem, the report attempts to highlight several experiences taking place within different Arab educational systems, not so much because these experiences are necessarily transportable but rather to point out that together with the challenges, there are also successes that can be built on.

Consistent with Carnegie's strategy of working with experts from the region, the paper has once again drawn on the practical experiences of experts from the Qatari, Jordanian, and Egyptian educational systems as well as from the regional, bottom-up experience of the TAMAM project, led by the Arab Thought Forum and the American University of Beirut

and spanning eight different countries. Under the able coordination and facilitation of Nathan J. Brown, these experts have authored a document that I hope will further contribute to the debate on education reform in the region—and help push it forward.

I want to acknowledge the Asfari Foundation for their generous financing of this project, and hope that policy recommendations in this paper will help guide future education policies in the Arab world.

Marwan Muasher
Vice President for Studies

Building on the Constructive Spirit of Reform

A deep sense of disquiet has set in among those dedicated to building better educational futures for Arab societies. This sense has been slow in coming but has become especially forceful in the past two decades. However, it is not merely disquiet that is at work; a spirit of experimentation is also growing. It is our purpose in this paper to harness the energetic sense of concern to the constructive spirit of reform by highlighting pockets where innovative and imaginative approaches are taking hold. Such pockets do exist and they need more support.

In the middle of the twentieth century, the most significant challenges were clear: educational systems needed to be built where they did not exist and expanded to cover the entirety of societies where they were already found. The emphasis was on construction, hiring, and expansion. The first conference of the education ministers of Arab states in 1960 focused on the need to cover all of society and combat illiteracy, among other topics.[2] The World Bank's first involvement in Arab educational matters, similarly, came when the institution helped with the construction of school buildings in Tunisia in 1963.[3] But over the next few decades, as those goals were met, however imperfectly, concerns gradually shifted. By 1994, it was qualitative issues, pedagogy, and change (such as the possibilities of distance education) that occupied the attention of Arab education ministries.[4]

In the twenty-first century, incremental steps toward addressing such concerns could no longer hold back a sense that something was amiss. Yes, legions of children were being schooled, but how were they being educated? Educational systems in the Arab world began to attract merciless critics and found only dispirited defenders. These defenders pointed to

the sharp constraints under which they worked and could cite the large numbers of students they were called upon to school. The critics issued an array of indictments that focused less on numbers than on quality: students were taught ineffectively, and the focus was on testing, disciplining, and credentialing them, using outmoded pedagogies that failed to foster critical thinking. To be sure, the critics had some numbers on their side, with students in the region showing disappointing results in international tests or in acquiring relevant skills for rapidly changing economies. Previously, diplomatic, international organizations had begun to use more alarming language. In 2015, a report from the United Nations Educational, Scientific and Cultural Organization (UNESCO) on science education directly linked political upheavals to reactions by "technology-savvy young Arabs."[5] Over the past decade, gaps between promise and performance have moved from technical reports to newspaper headlines and public discussions and from seminars to social media.

Perhaps the most prominent expression of alarm came in the 2002 "Arab Human Development Report."[6] Citing both quantifiable shortcomings and qualitative indicators, the report also formulated a series of positive principles. These included that "the individual should be central to the learning process"; that "without denigrating higher values and established creeds, intellectual and cultural heritage should not be immune to criticism and change in the face of scientific evidence"; that "creative human effort lies at the heart of progress [so that] Arab education systems should be restructured to give precedence to creativity and the dignity of productive work"; and that "education should help the young to cope with a future of uncertainty, acquire flexibility in the face of uncertainty and contribute to shaping the future."

Yet even as specialized bodies lodged these challenges, which were echoed in subsequent reports by international organizations, domestic educators, and hosts of others, educational systems found themselves under new strains. Political leaders and publics woke up to the demand for equipping students so that they could face new economic realities; political turmoil swept the region, generating politically induced population flows and waves of refugees; and this was followed by the global coronavirus pandemic. All these factors increased the burdens on existing educational systems.

The sense of crisis, therefore, became widespread. Indeed, it has deepened in recent years. The shock of the pandemic brought into clear relief how existing modes of education could be ill-suited for a world that faced new and unanticipated challenges. This should not have been news, given the technological revolution that was already raising children in one world while they were still largely attending schools anchored in an older world. But it also brought into equally clear relief how deeply unequal this world was structured. Inequality is a problem for those who are left underserved, undereducated, and underemployed. But they do not live in a separate world. Political systems, labor and other markets, public spaces, and other fields of interaction link our fates and futures. Systems of exclusion undermine healthy societies, political systems, and economies, often in ways that negatively affect future generations.

And unease has deepened at a fiscal level. A recent UNESCO document summarizing the situation in the Asia-Pacific region (including significant portions of the Arab world) contains a series of stark statements characterizing official behavior.[7] The report mentions "[l]ow and stagnating public social sector expenditures," "public education spending failing to meet minimum benchmarks," the fact that "public education expenditure is often inequitable," and that the coronavirus pandemic "has reduced the fiscal space for education finance." The same document also shows that North Africa and Western Asia (therefore including the Arab world) stands out for embodying the decline in public expenditure on education as a share of gross domestic product.

Is there a path forward? This paper does not argue for a single such path, but it seeks to shift the focus. Yes, there is a need for reform. Yes, there are some general directions that should be followed. But there is no single formula that has been discovered to bring this about, nor one that is likely to be discovered. However, there is some good news in that the pressures of the past two decades have also prompted a series of efforts and a new spirit of experimentation. Not all innovations have paid off, and those that have may not travel easily to new settings. But it is time to pay attention to the positive energy as well as the daunting challenges. Our constructive focus should not distract from worrying signs. But if there is quantitative evidence of disinterest at the level of national educational systems, there is qualitative evidence of innovation at the local level. And some senior leaders have begun to pay attention—often coming at the issue from the perspective of job creation or lagging economic indicators, but still showing some willingness to give reformers a longer leash. We draw attention to such efforts in the hope that their spirit can be emulated.

Resuming a Focus on Reform

Four years ago, a team organized as part of the Arab Horizons project at the Carnegie Endowment for International Peace entered the debate with a report that attempted to harness the critical views to a constructive agenda.[8] That report endorsed four themes within the different fields in which they were to be advanced:

- School: Engaging students and teachers in order to create a paradigm shift that places the development of the skills of constructive citizenship at the center of the educational system;

- State: Reinventing ministries of education so that they "mov[e] away from being service providers toward being vision/standards setters and process facilitators, while maintaining their role as regulators";

- Society: Reforming through engagement, whereby schools are no longer simply assigned the task of education but are anchored in communities, allowing for a conversion of "the educational apparatus from one that is asked to instruct children to one that turns them into learners"; and

- Building a new educational vision, one recognizing that "it is not simply that educational systems are not producing the expected number of skilled workers, but they are not producing good learners or good citizens."

The Arab Horizons report was part of a broader transnational dialogue. Similar themes have been picked up in scores of writings on educational reform—so much so that it is no longer necessary to underscore the need for reform or its broad outlines. It is time to be more specific. This paper is designed to be a successor to that earlier one but in a manner that builds on its constructive spirit.

Is there an educational model that is emerging as an appropriate alternative for Arab educational systems? Our view is that there is no such model at present, *nor should there be.* Not all experiments are successful, nor is there yet even a consensus on what success would look like or what goals should be met. Indeed, the search for a single educational model has led to some dead ends, as we will see. Our earlier report stressed the need to anchor educational systems more fully in the societies in which they operate, and successful initiatives are therefore ones that will vary according to the nature of each society. There is no single "Arab society." And at a global level, there is no single society—whether in Japan, the United States, Singapore, or Finland—that can be easily transposed from one social context to another. All educational experiences carry valuable lessons, and one of the most valuable is the need to avoid imposing a single vision that responds to generic problems rather than a specific context.

We opened this paper by communicating the sense of crisis that inspires alarm even in circles more known for tact and technical expertise. Unsurprisingly, the tone among independent scholars can be even more scathing. But underlying the thinking in both groups is a growing consensus that the secret to reform is innovation and experimentation rather than the imposition of a single national or international model or set of standards.[9]

If there is no single solution, there are still lessons and methods that can work elsewhere. Our purpose in this paper is therefore not to offer a single model or example but to explore efforts at experimentation and reform from the Arab world in order to understand which approaches were useful and what might be learned from them. We seek to provide a bridge that will make some of those experiences available to a wider audience. Our aim is to allow the initiatives in one location to inspire those in others, but it is also to move ideas from the realm of educational specialists to more general circulation among publics and policymakers

open to exchanging ideas about how to build better futures. While this is not a technical paper, it draws on considerable technical expertise in education. Most fundamentally, the purpose here is to place questions of educational reform—as the key to a better future—squarely on the public and policy agenda.

What Has Been Learned and What Must Be Done

In 2018, the World Bank published a report titled "Expectations and Aspirations: A New Framework for Education in the Middle East and North Africa."[10] After noting the bank's entrance into the education field in the Arab world by financing Tunisian school construction six decades ago, the report marked a very broad understanding of the need for reform. In its general outlines, it made for familiar reading, though the report was organized in an innovative fashion around four existing tensions: credentials and skills; discipline and inquiry; control and autonomy; and tradition and modernity. By seeking to shift the focus toward the second element in each of these pairs, the report suggested specific ways that educational systems could be reformed.

If there is such a strong consensus among experts, what are the obstacles to progress? In essence, we find two. First, national leaderships have embraced reform, but they have done so with a very narrow and utilitarian understanding of what is involved. Real reform is not only complex, it is politically difficult, since so many constituencies are involved, and even risky. For a region that experienced a period of youth-led political upheaval, the idea of empowering young people to think in new ways can induce nervousness. The result, therefore, has been a recurring pattern of leaders calling for change, while being unwilling to fully embrace it.

There is a second obstacle as well. For all the general consensus, it is not clear what works. Education is deeply embedded in societies even if it is too often regarded as a discrete field, located in school classrooms where it is delivered. The sort of learning for which we—and a generation of reformers—are calling might be spearheaded by schools, but not acting alone. Family structures, local communities, and myriad social and political authorities form an environment that governs would-be learners and that they are preparing to join.

These obstacles are linked. Political leaders wishing for productive and employable citizens often seize on the idea that there is a specific model or identifiable set of practices that will give them what they feel their societies need—graduates who can be economically productive but not politically troublesome. And the result is an atmosphere in which too many talk about reform, express frustration at the quantitative indicators, examine the latest international success story for a magical solution, and then, some years later, repeat the same sequence, with few if any tangible outcomes.

In a book from 2019 titled *Letters to a New Minister of Education*, individuals with considerable experience in the educational field, including some as education ministers, were invited to write letters sharing their views on the subject.[11] Much of the reading was familiar to anyone knowledgeable about the library of reports on Arab education. Eric Jamieson, an Australian expert with experience in both Egypt and Saudi Arabia, wrote,

> "Education for many years has pursued a path driven by results based on unimaginative testing of narrow curriculum. It has featured a deficit approach where people focus on gaps, one with tight controls, restrictive frameworks, a bias to risk aversion, and often including demanding inspection regimes. These aspects have combined to focus effort on increasingly limited and prescriptive expressions of teaching, learning, management and leadership. By flipping the focus to people's strengths, and freeing education from the debilitating impact of heavy controls, they will themselves recognize those areas that they will want to develop to achieve authentic progress."[12]

What emerges overall from the collective advice of the book, as well as the experience of watching the fate of other reports, is the necessity of recognizing that educational reform is a political process, not a technical one alone. It is deeply connected with culture everywhere and can, therefore, be complicated and controversial in societies where there are differences in values among citizens. That is not to say that academic study is irrelevant, but it needs to be harnessed to a vision that is idealistic, future-oriented, child-centered, and resonates with innovators throughout a society. Our paper therefore has a political message and a specialized one: Political leaders and publics need to embrace educational reform as a process that engages diverse societies and not as a restricted set of goals. Politically, there are potential risks and likely challenges to existing ways of doing things. Allowing those to dominate decisionmaking is a short-term strategy for which later generations will pay a heavy price.

A decade and a half ago, another World Bank report on education in the region was titled "The Road Not Traveled: Education Reform in the Middle East and North Africa."[13] Leaders today should work to ensure that a report on their tenure bears a very different title. To avoid the outcome of failing to take the road of reform, they must accept that a society does not produce innovative future citizens without allowing innovative educators to facilitate the development of new paths. As for specialists, they need to use the space provided to study not simply what worked elsewhere but also how new methods and approaches were devised and pursued. It is as much the process of reform as the specific steps adopted that might deliver the most helpful lessons.

The Way Toward Genuine Reform

In order to move forward on educational reform, we offer four general directions, even guidelines, of action, which do not take place in a vacuum. At the international level, major institutions are calling for the adoption of directions similar to the ones outlined here.

First, it is time to move from change to reform. The previous Carnegie Arab Horizons report on education described a set of educational systems under intense pressure for change. It also sketched out a vision for what this change should look like and how it should be pursued. Even before the report, and accelerating since, there were significant changes, much of it well-intentioned and reflecting expertise. But much of the change underway cumulatively added up to a great deal of motion and little movement. Efforts often focused on physical infrastructure, technical proposals based on international models, and measurable top-down initiatives that did not produce qualitative change. True reform must be holistic.

Second, such reform must be based on engaging diverse stakeholders. The Carnegie Arab Horizons report called for anchoring education broadly in societies, but the intervening years have shown that this is more easily said than done. In 2018, we did not examine the complexity of what "engagement" meant. Much of the issue is that there are different stakeholders with different agendas—parents, students, educators, and regimes. But more fundamentally, there is no place for them to engage with each other. True reform must emerge from a discussion among diverse stakeholders over what kind of reform is necessary, and our current paper therefore includes a strong call for such a process.

Third, it is time to seize the moment. While the task is daunting, this is an opportune period. The need for reform is more widely felt, and pandemic-induced experimentation has led all those involved to think of different ways of doing things. A recent book sponsored by UNESCO's Global Education Innovation Initiative, titled *Learning to Build Back Better Futures for Education: Lessons From Educational Innovation During the Covid-19 Pandemic*, presented nineteen global experiences of innovation during the pandemic.[14] Two were from Egypt, one from Saudi Arabia, and one from Qatar—a welcome overrepresentation of the Arab world. Whatever the lasting value of those experiments, the rapid way in which systems responded to the pandemic showed that quick action was possible. The task is to transfer that energy to more normal times.

Fourth, it is necessary to reiterate that citizenship should be the foundation of reform, not an afterthought. Any reform must view education not simply as imparting skills or bestowing credentials but as cultivating citizenship. However, it is also necessary to realize that repeating this idea is not enough. Underlying the difficulty of realizing a shift to citizenship is the

hard reality that there is no consensus among societies in the region over what citizenship involves, as well as nervousness that it may be connected to unrest, attacks on religion, and the dismissal of tradition. So, it must be emphasized, paradoxically, that this lack of consensus is precisely what imposes a focus on citizenship. Any educational vision involving citizenship must address values, but it must do so in a way that develops individuals able to operate in a world frequently characterized by disagreement. The necessity to equip students to engage with the range of human knowledge and values, even while they are anchored in their own society and its heritage, is recognized by educational specialists. In the next section we will examine specific experiences from the Arab world in which specialists have adopted technical ways of incorporating insights into their vision of reform. Such innovation needs to be transferred from discussions among educators into the broader public debate.

Finally, we must recognize that there is a global movement that is progressing in a similar direction to the one we are proposing. UNESCO's Futures of Education project has called this year for a "new social contract," which it describes in general terms:

> Broad social mobilization to transform education should be supported by innovation and research. Education needs to become a global responsibility with international cooperation expanded and made more equitable in a spirit of solidarity that builds trust on all levels.
>
> A new social contract for education will require difficult changes in power relations between states, social movements, citizen groups, professional associations, business, and other actors. Despite the inspiring work of many over recent decades, we still have to challenge ourselves to think and do differently. Engaging in this important task together is our best hope for transforming our living cultural traditions into sustainable futures.[15]

Our paper is designed to take that global call and focus it on the Middle East and North Africa. We advance some specific examples of regional initiatives that are worthy of attention. We then return to the idea that the path forward runs not through technical improvements but broad social involvement and responsibility.

What We Are Learning: Specific Experiences From the Arab World

We do not wish merely to join the ranks of the critics of existing educational systems but also to strengthen the ranks of those who offer something constructive as well. The harsh criticism is often warranted, but it can lead to despair. The problems are so intractable

and interconnected with political, social, and economic impediments that they cannot be resolved. And indeed, they cannot be "resolved" if that means that a perfect system can be built overnight. But there have been pockets of innovation. We present four such pockets in this paper, each taking place in a very different setting, with different tools, and operating at different levels. None is a panacea but all show how some positive steps can be taken.

The first example involves Qatar, in which two decades of experimentation at the national level have produced a very different educational system than what existed previously. Some changes have been reversed or revamped, so we examine the experience to show what was learned over time. The second focuses on what is referred to as blended education and "connectivism" in Jordan—a way of anchoring educational processes in a broader set of institutional, pedagogical, and even global networks. The Jordanian setting is characterized by a strong impetus for reform but also a set of acute constraints and imperatives that were imposed during the pandemic. Our third examples turns to an innovation in Egypt in which a strong national push toward education focused on science, technology, engineering, and mathematics (STEM) has evolved into a broader set of approaches that includes arts and reading. Such efforts have been developed through experimentation and networks (some transnational in nature). Finally, we turn to a promising grassroots project of educational reform, launched with the support of the Arab Thought Forum and the American University of Beirut, to see how reform can be accomplished by educators operating within existing systems.

Trial and Error in an Experimental Setting: Two Decades of Reform in Qatar

In order to reform its educational system, Qatar took many of the steps that educational reformers elsewhere in the region might adopt. The country's efforts showed a willingness to think holistically, for example by tying school reform to standards in university, in the hope that better-educated school students would guarantee success at the university level, thereby reducing dropout rates. The reform process was also one in which officials grasped the value of trial and error. They did not see this process as being linear but as one in which they accepted the necessity of going back to the drawing board and ameliorating policies if necessary, reversing those that didn't work. This was especially true of the initial effort to make English the language of instruction, which created cultural problems that compelled the authorities to later modify their decision.

In 2002, Qatar decided to reform both its kindergarten to twelfth grade (K–12) and its university systems in order to keep up with the ever-changing economic landscape in the country and globally. The Qatari government was also concerned that the school results

of Qatari children and adolescents were not up to international standards as suggested by international tests, such as the Program for International Student Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS). At the university level, there was also uneasiness that students graduating from Qatar University were not prepared to meet employers' expectations and the demands of the emerging labor market, let alone help fulfill Qatar's ambitious vision for the country's modernization and economic diversification.

The old system under the Ministry of Education had several layers and units that were hierarchical, bureaucratic, and resistant to change, innovation, and reform. The ministry lacked the tools to monitor or assess performance or implement changes for improvement. It developed textbooks that were used in all classes across all public schools, which adopted content from existing Arab texts. The Qatari education system was focused on top-down knowledge transmission. In turn, at the university level, Qatar University was struggling to gain independence from the Ministry of Education to set its own policies governing its academic and operational processes.

Over the past two decades, Qatar, like some of its Gulf neighbors, has imported a globally unprecedented number of educational institutions, systems, and programs to address labor market inefficiencies and drive its reform agendas. The country has financed the establishment of the Qatar Foundation, which hosts academic programs from top Ivy League universities, as well as programs from mainly U.S. universities such as Weill Cornell Medical College (medicine), Carnegie Mellon University (computer science and business), Texas A&M University (engineering), Northwestern University (media and communications), and Georgetown University (international affairs).

Leaders in Qatar have cited the high success rate of the imported systems, and in turn these successes have been used to defend the idea that such systems could be adapted to the local Qatari cultural context. Indeed, Qatar's efforts to reform the national education system in public schools and at Qatar University and to import prominent and successful academic programs from abroad were part of a twofold strategy, the main purpose of which was to address the fact that educational reform is a long-term project, needing years to pay off and often facing many obstacles. Therefore, such reform often requires being able to amend policies, retract them, and start over again. Qatar had the financial resources to do all these things, especially as the fate of the country's younger generation was at stake.

In 2001, the Qatari government commissioned the RAND Corporation to evaluate the K–12 education system and propose reform options. The Qatari leadership selected an independent school model, based on the charter school system, and in 2002 the Education for a New Era (EFNE) reform initiative was launched along those lines. Qatar set up a Supreme Education Council (SEC) to implement rapid and major changes to the K–12 education

system. The SEC operated initially alongside the Ministry of Education as a second regulatory body, before the ministry was phased out. Over the following decade, the country initiated a fast-paced reform and decentralization effort of the K–12 system. In 2004, it launched the first group of independent schools, and by 2011 all Ministry of Education schools were converted to independent schools.

EFNE was meant to introduce flexibility in education and offer options. Qatar rapidly shifted to a model based on autonomy, accountability, variety, and choice. National curriculum standards were developed in four core subjects: Arabic, English, mathematics, and science. The authorities introduced English as a medium of instruction, only to later reverse the decision as a result of the controversy it generated. Schools were allowed to develop their own philosophies and curriculums, but they had to meet the SEC's standards in the four subjects mentioned. In theory, the idea of autonomy and choice in education should have had positive effects, making schools and educators sensitive to the requirements of families and teachers.

There were several main features of the K–12 reform. These included autonomy through decentralized governance, where school owners operated within the terms of a contract entered into with the SEC; accountability through various measures; variety in educational philosophy and operational options; and parental choice in selecting a school for their child. Qatar also adopted more student-centered teaching methods and provided more challenging learning environments. To implement the reforms, the authorities established new institutions to avoid conflicts of interest in the contractual aspects of independent schools.

The reformed structure consisted of separate institutes and offices under the SEC and included the following programs.

- The Education Institute oversaw the contract process and provided academic support. It also developed curriculum and performance standards and began a process of school staff development. It was comprised of two main offices: First, the Curriculum Standards Office aimed to develop curriculum standards for Arabic, English, science, and mathematics—the four core subjects seen as critical to fulfilling Qatar's social and economic goals in its educational reform effort. Second, the Professional Development Office conducted needs assessments within independent schools and subsequently designed professional training programs for teachers, principals, school operators, governing boards, and others.

- The Evaluation Institute monitored and evaluated school performance and gathered educational and sociological data on schools, parents, teachers, principals, and students. It was comprised of two offices: first, the Student Assessment Office, which developed and conducted national tests in all public schools throughout different

> years of schooling and oversaw the process of maintaining test quality, and second, the School Evaluation Office, which evaluated schools by developing so-called school report cards that showed school-level results from the national test and other evaluative data about schools. The results remain available to parents who can use them when choosing schools for their children, as well as to school administrators to help schools improve.[16]

The initial EFNE reforms, which were meant to enhance student achievement, were subsequently reversed in 2016 as a result of tests such as PISA and TIMSS. While the results showed significant progress over those recorded prior to the reforms, they still placed Qatari students at the bottom of test scores globally. As a result of public dissatisfaction, the authorities abrogated the EFNE reforms and introduced a voucher school system. This was followed by a gradual return to centralized control over education, through a revival of the Ministry of Education. The Education Institute was dissolved, but the Curriculum Standards Office and the Professional Development Office were maintained and placed under the ministry's authority. Similarly, the Evaluation Institute was disbanded, while the Student Assessment Office and the School Evaluation Office were also placed under the education ministry.

The main setback was the adoption of an overly ambitious reform agenda, which did not take into account the lack of capacities to plan, implement, and administer the reform agenda. The success of independent schools depends, in part, on building teachers' capacity and improving schools. It became evident that the workloads of teachers and principals increased as they struggled to carry out the needed changes that were required to implement EFNE. The reforms put teachers, school leaders, and parents in a position that required them to undertake tasks for which they did not have the skills required to achieve results.

Specifically, teachers were not able to concurrently develop and teach content based on the standards set by the SEC. Moreover, organizing training sessions to show teachers how to do so during the implementation phase was both overwhelming and experimental in nature. On top of this, switching from Arabic to English was an additional hurdle for teachers and students. Though the SEC contracted with professional international trainers to be stationed in each school to assist teachers in overcoming obstacles, the teachers were unable to cope with the immense workload and radical changes. The authorities allocated budgets to give principles a free hand in running school affairs and recruiting personnel. However, this was a new task for many of them and greatly expanded their responsibilities, for which a considerable number didn't have the aptitude. This underlined how educational reform is a continuous project in which the abundance of financial resources and political determination for reform are not sufficient to achieve the targets set.

One can summarize the more salient problems visible in the Qatar school reform as the following:

- *Language issue*: English is a global language and there is sometimes a strong push to emphasize English-language mastery. However, the Qatari K–12 reform awakened cultural sensitivities, since the SEC implemented a sudden and mandatory transition to English language, mathematics, and science courses that were taught entirely in English. However, it was not only the sensitivities related to culture and identity that proved contentious. The shift to English also meant that teachers, students, and parents struggled with the move away from their mother tongue, while the reform meant that Islamic studies and Arabic courses were scaled back.

- *Short time lines*: Despite, or perhaps because of, the deep commitment to change, reform agendas in Qatar had short time lines as the leadership was eager to see rapid results and progress. The K–12 reform was implemented quickly and with great hope, but this meant that the effort neglected to engage, prepare, and develop the capacity of key stakeholders on whom the long-term success of the reform effort depended. The pace of reform should normally be determined by a system's ability to train teachers and administrators. In the absence of this, a country will not be able to achieve intended improvements in classrooms that depend on having professionally developed teachers and capable principals.

- *Lack of trained teachers and administrators*: The deficit in trained teachers and staff directly impacted the successful implementation of new curriculums designed to meet international standards. The political will was there, as was the financial support, but what was missing was the right setup and human resources. A majority of teachers in independent schools are expatriates, mostly from other Arab countries, and given Qatar's large expatriate population there is also great diversity among parents with children attending independent schools. Teachers at such schools struggled to develop curricular content that took into account new international standards in Arabic, English, science, and mathematics. School leaders were under tremendous pressure to drive reform locally and foster innovative educational practices in the school culture.

Following EFNE's revocation, the authorities adopted two strategies.

The first was aimed at satisfying the urgent need to build more capacity and expertise and to take the time to develop local capacities in the areas in which the EFNE reforms had failed to deliver. In 2016, the Ministry of Education decided to take back the process of curriculum development from public school teachers and place it in the Curriculum Standards

Office. The office was authorized to develop a comprehensive national curriculum framework to allow more harmonized school curriculums, which would include twenty-first-century competencies, and most importantly develop textbooks fulfilling its mandate.[17] In addition, the Office of Professional Development was retained to operate more focused training programs.

The Ministry of Education, in its effort to achieve quality in its education system, retained the School Evaluation Office and the Student Assessment Office, as noted above. These bodies pursued their earlier responsibilities of implementing national student assessments and evaluating schools and their accreditation processes. Moreover, the ministry, to build local capacities in the evaluation sector, developed a program for the formation of school assessment specialists, who were licensed as accredited international assessors by the United States–based Accrediting Commission for Schools, Western Association of Schools and Colleges.

The second strategy was to expand the allocation of school vouchers. Parents were issued vouchers to select any accredited private school that offered the International Baccalaureate, the International Certificate of Secondary Education, or any similar, internationally accredited programs for their children. This was coupled with the opening of more reputable international schools with well-established curriculums through public-private partnerships. Adoption of such partnerships encouraged the establishment of new schools, as the schools received financial support through the allocation of land and the financing of their construction and operation costs. After a twenty-five-year period, these partnership arrangements will allow for the handing over of the schools to the Ministry of Education.

The scene at Qatar University until 2004 was different.[18] The professional colleges, including engineering, business, and sciences, were up to international standards curriculum-wise and in terms of instruction and quality. Following the mandate to reform Qatar University, the majority of professional and academic programs at Qatar University gained international accreditation, such as College of Education gaining accreditation in 2013 from the National Council for Accreditation of Teacher Education. In 2019, the Program of Mass Communication was accredited by the Accrediting Council on Education in Journalism and Mass Communication.

The Office of Academic Program Review and Program Learning Outcomes oversaw quality assurance at Qatar University. The office's mandate was to review academic programs to ensure they were outcome-based and to measure the performance of students against the intended learning outcomes. For further enhancement, experts in the specific fields of specialization from reputable universities worldwide carried out cyclical reviews. In addition, the Office of Faculty and Instructional Development offered professional development opportunities for faculty to focus on learner-centered teaching, usage of supported education technologies, and assessments of program learning outcomes, among others.

To allow for the recruitment of high-quality professors worldwide and to offer students diversified international experiences, Qatar University expanded the use of English as the language of teaching and communication in several fields, including media and communications, international affairs, and law. Though Arabic is Qatar's official language, English is the language of business communication, particularly in those sectors that are prominent in the country, notably hydrocarbons, as well as other domains, such as the hosting of sports events or conferences, for which Qatar has gained prominence in recent years.

Qatar University has been ambitious in seeking to raise the bar for students and faculty. It has worked diligently to pursue accreditation from the Southern Association of Colleges and Schools, a regional body based in the United States, to ensure that it meets global standards. Also, previously the university aimed to ameliorate student performance by restricting admission and raising probation policies, so that students who lacked motivation or whose academic performance was inadequate were not allowed to continue their studies. For students who are dismissed from university because of their unsatisfactory academic performance or who are not admitted to Qatar University, other options are available, including enrollment in community colleges or technical colleges such as the College of the North Atlantic, a Canadian technical establishment whose name was changed in 2022 to the Doha University for Science and Technology.

Officials at Qatar University were hoping that school reform would succeed so that the students who were admitted from the country's independent schools would be more successful in pursuing their university-level studies, limiting dropout rates. Qatar has a small population, so it cannot afford to see even a low percentage of its young people exiting the university system. However, because of the failure of K–12 reform, the university had to relax its probation policies and reinstate students who were dismissed due to the more stringent policies it had adopted earlier. It also established student support units to assist lagging students and offered the option of programs in business and international affairs that were taught in Arabic.

Reform in Qatar University was more successful than K–12 reform. The scope differed in both situations. Autonomy and decentralization were major objectives and outcomes of the reform in Qatar University. The university, with its experienced professors, could operate independently, guided by best practices in academia, which was not the case in public schools.

The Qatari model is unlikely to be replicated. It was developed as a result of political determination, advanced because of the availability of fiscal resources, and implemented with a small population of students. Its record is mixed, with a strong share of disappointments and false starts, as well as some successes. Nor is it clear that it is suitable for export, since the specifics of the reform effort changed considerably over time. However, in a different sense, the Qatari path—in which a high-level impetus for reform is coupled with a willingness to experiment and foster the evolution of a system that serves a rising generation of students—is one to which other states should pay attention.

Rethinking Education in Jordan: Steps Toward Connectivism

Educational reform has been just as much of a priority outside the Gulf states, though serious economic crises in many Arab countries have frequently hindered the adoption of reform measures. In Jordan, educational institutions have struggled to meet emerging educational requirements for how knowledge and skills are cultivated and disseminated among youth, especially in public schools and universities. This situation has created a gap between private and public education that has exacerbated social inequalities. Not only has the government proven unable to bridge this gap, but also downward social mobility triggered by the country's difficult economic situation has meant that middle- to lower-income families have been compelled to move their children from private to public schools.[19]

This exodus has accelerated over the past three years, especially since the entirety of Jordan's educational system went online during the initial phase of the coronavirus pandemic in 2020. The exodus has happened for two reasons.[20] First, with unemployment reaching nearly 50 percent during the lockdowns, and with stringent restrictions on gathering in public places, including workplaces, many families found that they could no longer afford the fees of private schools. Second, unable to make use of their extracurricular programs and relatively superior physical facilities, private schools lost their advantage over public schools.

Another problematic gap is the one that exists between the skills of high school and university graduates, on the one hand, and the needs of the rapidly evolving labor market, on the other. Knowledge acquired by rote in public schools and universities is less and less applicable to the job market, a significant portion of which is now globally oriented.

To remedy matters, it became imperative for the Jordanian authorities to embrace a bold new mindset toward teaching and learning. Blended or hybrid learning, which combines traditional instructor-led teaching mechanisms with online and digital methods of imparting information and stimulating critical thinking, offered the best option. This form of education can prepare students for jobs in an increasingly globalizing and thus closely interconnected world, a development with which Jordan has failed to keep pace. According to the World Bank, in 2021 "youth unemployment reached nearly 50% and the women's labor force participation rate is 14%, one of the lowest in the world."[21] There are several reasons why Jordan's educational institutions have struggled when it comes to education.

One major factor contributing to the overall stagnation of the educational sector is the general economic downturn that Jordan has experienced since 2007.[22] This downturn has been accompanied by a dramatic rise in the national population, from around 6.2 million in 2007 to 11.1 million in July 2022.[23] As a result, the quality of public services diminished in almost every regard, and resources to meet rising demand were stretched thin. Schools and universities suffered heavily, owing to the preponderance of young people in the country,

with Jordan's median age at 23.8 years and 63 percent of the total population under 30 years old. In essence, economic decline and a population surge stymied educational change even as they also made it imperative.

A second factor is the overall deficit of know-how at various levels of educational institutions. The exodus of intellectuals to Gulf countries over the past three decades and the in-country migration of competent staff to higher-wage sectors of the economy have contributed to emptying the educational sector of the very people most qualified to implement a paradigm shift.

The absence of consistent and clear leadership throughout the educational system is a third element that has stunted much-needed change. A revolving door of government officials, with some ministers' tenure lasting months or even days, creates an unstable reference point for educators and educational institutions. This is particularly true in light of the fact that, in 2001, the government was tasked by King Abdullah II "to undertake the supervision and close control of public and private institutes of higher education and work towards raising their level to become a model of advanced education," largely through the Ministry of Higher Education and Scientific Research.[24] Over the course of the past two decades, this ministry (which is distinct from the Ministry of Education) pursued a cookie-cutter, one-size-fits-all approach to academic programs, curriculum development, textbooks, and assessments. As a result, the higher educational system became mired in regulations and constantly shifting demands for reporting on nearly every aspect of operations, which has hindered the capacity of teachers and administrators to innovate.

A fourth reason for why Jordan's educational institutions are struggling to meet emerging requirements, and one that has received insufficient attention, is what American professor and cultural theorist Donna Haraway calls "informatics of domination."[25] This refers to turning students into recipient and passive learners through a rigidly structured educational system. At the Ministry of Higher Education, resistance to altering the system, much less overhauling it, remains a barrier to enacting the necessary reforms. This has resulted in the perpetuation of a standardized curriculum across all fields, particularly those related to the humanities and social sciences. The practice is to inculcate students with a prescribed corpus of knowledge through teacher-centered methods of instruction.

As a result, unless a rapid transformation occurs on a cultural and social level, the output of schools and universities will simply fail to meet labor market demands, meaning that Jordan's downward economic spiral will continue. Thus, retraining the current and next generation is a national necessity. Lifelong learning, anticipating problems, creativity, and empathic analysis are the skills most needed in Jordan's educational landscape. This will entail, naturally so, rethinking of the positioning of teachers and learners inside the classrooms and in schools. Therefore, robust training is highly required and needed to build the competencies of teachers to grow smoothly into their new roles of mobilizing, guiding, and facilitating learning within the new paradigm shift in the educational sector in Jordan.

A decade and a half into this century, the Jordanian government finally began to take educational reform seriously. Its adoption of a blended, or hybrid, system of education seemed the best means of effecting meaningful change in the national educational system. This, it hoped, would bring learning in Jordanian schools more in line with the lived realities of the so-called millennials and digital natives. Learning was to become inclusive, collaborative, creative, and decentralized.

Blended or hybrid learning generally takes as its point of departure a recognition that technology has deterritorialized a learning environment once limited to compartmentalized schools and universities and has diversified traditional learning centers so that they now consist of multiple spaces and networks of learning. This is termed "connectivism." As it happens, blended learning dovetails with connectivism. Both disrupt educational orthodoxy and redefine learning pedagogy by shifting it, first and foremost, into learning spaces of free and flexible accessibility and into a sphere in which knowledge attainment is in part self-directed by the student. Blended learning also diversifies the acquisition of knowledge resources, making them inclusive of various platforms of collaborative and self-paced learning.

If effectively conducted, blended or hybrid forms of learning provide students (including adults, as with programs focused on "andragogy," or adult education) with myriad learning opportunities, as well as the flexibility to deal with the world that connectivism is creating. Not only are material resources multiplied through the spread of the educational process into virtual spaces, but blended learning also has the potential to fill the knowledge and skill gaps created by the traditional classroom-based approach toward education. However, serious efforts must be made to ease university professors and teachers into the mindset needed for the shift in teaching and learning.

In 2015, Jordan began an incremental process of moving its higher educational system toward blended and online learning.[26] By March 2020, however, what were originally envisioned as medium- and long-term plans became much more pressing, as 2.37 million students switched their educational instruction completely online following the onset of the coronavirus pandemic.[27] Thus, in Jordan's private schools and universities, it is possible to see the beginnings of the application of connectivism in the increasing adoption of blended-learning approaches. Nevertheless, more effort is required for connectivism to be operationally implemented in public schools and universities, which lag behind their private counterparts.

In a heartening development, even after COVID-19 emergency measures subsided and in-person learning was reinstated in Jordan, developing the human resource capacity for blended learning remained a priority. To that end, the Ministry of Higher Education adopted Bylaw No. 69, which was passed by a Council of Ministers' decision on June 30, 2021, and approved thereafter by royal decree. This laid out the parameters for the implementation of blended learning across Jordan's universities, allowing reform to proceed at the right pace

and direction. Moving forward, what is of utmost necessity is the formulation of a careful and thorough roadmap to create forms of blended learning that are interactive, collaborative, conceptually grounded, and adaptable to the pace of the learner.

Examining the experience of Jordan, which like much of the world took its educational system online overnight, allows us to make several observations. The evidence shows that Jordan did well in identifying the resources and platforms needed for distance and online learning, but the country struggled with the shift from a teacher-centered approach to one in which students became active participants in attaining knowledge. For example, there was a deficit in assembling, grouping, curating, and packaging resources aligned with learning-based outcomes as opposed to teaching-based outcomes. For students to grow smoothly and confidently into self-directed learning—which is very much a part of blended learning—an integral and holistic educational system of both in-person and online learning must be put in place. This system must reinforce the paradigm shift from what practitioners call the banking model of education, where teachers deposit knowledge to students, to an altogether different learning model.[28]

This must happen quickly, for the world is changing. Standardized tests and exams are fast falling out of favor globally, with influential experts in the field of education questioning their reliability in measuring students' abilities.[29] To avoid the pitfalls of such tests and exams, which are susceptible to cheating and plagiarism, Jordanian schools and universities might consider including what are touted by their proponents as "authentic assessments," such as case study analysis, debates, and designing and conducting original experiments, among other methods. These assessments provide students with the opportunity to analyze, synthesize, and apply what they have learned.

If properly addressed, managed, and designed, traditional and online learning can complement each other and facilitate the emergence of holistic online platforms designed to virtually manage content delivery, classwork, and assessments. Yet this is not always what happens. Studies have demonstrated that, if not employed efficiently and effectively, online learning is more tiring, less effective, and more time-consuming than classroom-based interactions. Moreover, in Jordan, the notion of a paradigm shift is not without controversy. Many Jordanian parents of a more traditional bent are uncomfortable with the changing role of the teacher to that of a learning facilitator.

It is essential that online learning be combined with classroom instruction that encourages interaction, participation, and investigation as the primary approach toward the subject's content. To fully realize their transformative potential, online and blended approaches should not simply apply top-down, teacher-centered methods with new technology. In educational systems like the one in Jordan, the risk of misusing virtual teaching and learning platforms is high. Educators across the nation will need extensive technical training and meaningful experience in order to be able to effectively implement a connectivist-based approach in the classroom, school, or university. Simultaneously, the advantages of the

teacher's new role in supporting and facilitating the learning process of students, as opposed to spoon-feeding them information, will have to be explained to parents. Moreover, both students and educators will also need to be equipped with the tools needed to utilize and benefit from online and blended learning. This includes not only functional devices (such as tablets or laptops) and reliable and affordable internet connectivity but also space within the household for the student to move beyond passive listening to becoming an active participant in discussions. Such issues require close attention.

These are all real challenges, and potential drawbacks, to a rapid and comprehensive implementation of blended learning. Yet there are compelling reasons to see blended learning as a tangible way to help close the skill and knowledge gaps between Jordan's educational and productive sectors. The multidimensional aspect of connectivism would allow the country's overstretched educational system to expand its educational resources and infrastructure to new virtual networks of learners. It remains to be seen, however, if Jordan will be able to adopt the mindset that would enable constituencies and stakeholders—students, teachers, parents, and government officials—to break with the outmoded passive-learning paradigm.

One positive development was the 2017 establishment of the National Center for Curriculum Development as an autonomous body that operates free of ideological interference of the sort that hinders reform and the overdue paradigm shift in education. The center seeks to bring about a reformatory leap in the educational sector in Jordan through consistent development of an educational system that is responsive to the rapidly changing world of education even as it reflects the specificity of the Jordanian context. The recently curated and designed schoolbooks and curriculums, the enhancement of blended learning and connectivism, the implementation of "authentic assessments," and the ongoing training of teachers on mastering the newly adopted transformative learning andragogies are all steps in the right direction.

Egyptian and Transregional Experiments: From STEM to STEAM to STREAM

National leaders, when they turn their attention to education, often focus on systems that produce employable graduates, both to satisfy short-term needs for job creation and to provide a long-term basis for economic development. Nor are these leaders alone. Parents, too, often steer their children toward careers that not only seem more prestigious but that are also likely to provide them with economic security.

Such needs should be met. But if they become the sole focus of educational reform, they risk producing the form but not the substance of education. And for all their focus on science, engineering, and technical education, it is not clear if the educational systems in the Arab region are producing graduates who are competitive internationally. Countries are learning the hard way that more is needed. But what? And what can countries under severe fiscal pressure—and therefore unable to provide students and teachers with access to advanced technology—do to promote education?

Egypt has seen some experimentation in this regard. In one sense, it looks very different from the Qatari variety. Both were sparked by a national imperative to prepare students for the job market, but the Egyptian experience took place in a more fiscally constrained environment with a far larger population and through more of a grassroots effort. In the first decade of this century, the Egyptian Ministry of Education and Technical Education began contemplating ways to reform its outdated teaching system. The idea was to cultivate leadership and scientific inquiry through innovative project-based learning that would allow students to make positive contributions to Egyptian society, principally as scientists. This was no small task. Egypt has the largest educational system in the Middle East, with 55,000 schools. Moreover, the country's 25 million students in K–12 are expected to rise to 34 million by 2030,[30] alongside almost 1 million teachers.[31]

The Egyptian government considered educational reform a priority and, after reviewing the available options, settled on a teaching approach called STEM education. In addition to attaining knowledge in the hard sciences, the goal is for students to develop skills such as literacy in digital information and communications technology, teamwork, resilience, self-confidence, negotiation, and self-expression and ultimately to emerge primed for a lifetime of learning.[32]

The United States Agency for International Development (USAID) funded STEM, and the first STEM school was opened in Cairo in 2011. The plan was to establish five STEM schools in Egypt between 2011 and 2015, which would then serve as models for sustainable STEM education to be replicated throughout the country.[33] A sum of $25 million was invested in the establishment of the schools, which required infrastructure, high-tech fabrication labs, and laptops instead of physical textbooks for students. More financial and technical assistance for the project came when several entities joined USAID in forming the Educational Consortium for the Advancement of STEM Education in Egypt. By 2022, there were nineteen STEM schools in Egypt.

Education scholars at the American University in Cairo (AUC), a nonprofit higher education institution, added arts ("A") to STEM, which became STEAM, for their own students. Whereas the emphasis on math and the sciences in STEM geared students toward the job market, STEAM included a focus on values, social responsibility, and citizenship. The

nonscientific disciplines ensured that the country's culture and values were reflected in any educational reforms. Indeed, given the importance of community and empathetic support from stakeholders, a core principle of STEAM education is to ensure that it is embedded in, rather than divorced from, its cultural context.

Even STEAM, both the educational package and the acronym, can be further tweaked, as countries or educational institutions localize innovative ideas borrowed from abroad. For example, in STREAM, which has taken root in the United Arab Emirates and Saudi Arabia, the "R" refers to "reading."[34] In Malaysia, the "R" in STREAM refers to "religion."[35] For American roboticist Holly Yanco, of the University of Massachusetts, Lowell, and Kristen Stubbs, of the Robotics Institute at Carnegie Mellon University, the "R" stands for "robotics."[36] Indiana's Purdue University has retained the STEAM acronym, but made the "A" stand for "agriculture."[37]

Another STEAM-related project that AUC embarked upon consisted of offering the Arabic-language STEAM Massive Open Online Course (MOOC) in cooperation with Edraak. MOOCs are freely accessible online courses, and Edraak, an online portal established by Queen Rania of Jordan for the promotion of knowledge in the Arab world, offers educational courses by top-notch universities.[38] The STEAM MOOC was offered twice in 2017, with the first phase reaching over 18,000 participants and the second over 15,000. Currently the MOOC is self-run, and until now, over 64,000 students have joined. Participants hail from all over the world, though most come from Egypt, Jordan, and Saudi Arabia. The age bracket primarily represented is twenty-three to twenty-seven years old, followed by thirty-three to forty years old.

If STEAM-related educational reform in Egypt continues apace, we can expect a series of outcomes.

- Reform will not be dependent on high-tech infrastructure, as this might hinder its implementation. Schools can implement STEM/STEAM education with low-tech infrastructure that is accessible across all age groups and all sectors of society, regardless of their financial status.

- Education standards and indicators will develop according to research-based standards.

- Professional development programs will be designed with a view to preparing teachers to emphasize a student-centered approach revolving around real-life issues. Such programs shift from the concept of one-size-fits-all training to an approach that is tailored to specific circumstances.

- Reform is likely to give rise to a school culture based on dialogue and mutual understanding between students, teachers, administrators, and parents, which will, in turn, allow teachers to co-plan, co-teach, and team-teach in a collaborative atmosphere.

- Reform will likely lead to the development of effective systems of assessment that move away from traditional high-stakes exams to evaluation based on comprehension and performance and that align with the STEM/STEAM/STREAM model and standards.

- The evolution allow reform to combine top-down and bottom-up approaches, so that they complement each other.

- The expansion will localize reform efforts to ensure that the values and main principles of the culture are instilled in students.

Despite the efforts to reform education in Egypt through STEM schools, the schools faced several challenges. For example, even among advocates of change and reform, there remained a residual attachment to older methods of assessing students' abilities. STEM schools, which tout themselves as being "for the gifted and talented,"[39] began by admitting students with high grades in the middle school exit exams. Yet reliance on high grades in exams that were geared toward rote learners clashed with the philosophy of STEM, which emphasizes learning and twenty-first-century skills rather than memorization. In STEM schools themselves, students are assessed via capstone projects that represent 60 percent of their total scores in tenth and eleventh grades and 20 percent of their scores in twelfth grade.[40] There were related challenges to curriculum design, apparent in designing and implementing project-based learning approaches and assessing learning through new methods. This required readiness on the part of teachers to move beyond what their traditional educational programs could provide.

Perhaps predictably, introducing such a paradigm shift in teaching, which entailed going from a rote learning system to one based on inquiry and critical thinking, was met with resistance from students, their parents, and teachers. For any such transformation to succeed, it is essential that teachers change their pedagogical practices to align with the new paradigm. To facilitate such a change, AUC inaugurated a long-term teacher development program called the STEAM Professional Educator Diploma (PED) in 2012.[41] The purpose of STEAM PED, which presents a unique model not found in other Arab countries, is to fill gaps in the Egyptian teacher education system, especially with the spread of STEM-style education in schools across Egypt. Traditionally, future teachers studying education in national universities are prepared to teach one subject in its silo, with limited opportunities to expand to other disciplines in the sciences or humanities. STEAM PED is supposed to remedy this limitation.

PED, which is an eighteen-credit program spanning eighteen to twenty-four months, is recognized by the Supreme Council of Universities. The council, a governing body in Egypt for all higher education institutions, oversees quality and equivalencies of academic degrees based on national and international standards. In terms of content, STEAM PED offers courses under the following titles: alternative assessment; interdisciplinary methods of teaching; utilizing engineering design in STEAM teaching; integrating technology and arts; and, finally, a clinical-practicum course. Each course is offered for twelve weeks. Teachers can choose between courses meant to prepare them for teaching students in early childhood and those geared toward adolescent learners, depending on the grade level of their interest. As for the practicum course, it aims to facilitate the teachers' integration of knowledge and skills in order to enhance their ability to effectively employ reflective, experiential, and pragmatic pedagogical approaches in the classroom.

The program activities and structure apply principles from sociocultural theories of learning and are open to teachers of all grades and disciplines. As teachers progress through the courses, their instructors ensure that planning for project- and problem-based learning is consistent with the cognitive development stages the teachers will encounter when working with students of various ages. This ensures that the STEAM disciplines are presented in a holistic manner, with not only "no child left behind" but also "no discipline left behind."

It should be noted that activities during the program emphasize collaborative group work among teachers as they brainstorm, discuss, and plan interdisciplinary and transdisciplinary STEAM units. Through this setting, teachers represent their subject disciplines and try to identify how they can be integrated with others. This experience anticipates roles the teachers will fill when they return to their schools to co-plan, co-teach, or team-teach. It also provides for reflective practices where teachers question, review, assess, and replan for impactful learning opportunities for themselves as well as current and future students.

Yet STEAM PED itself faces conceptual challenges. Two disciplines—engineering and technology—raise questions in terms of implementation. Historically, they have not been taught in high schools and their introduction has, consequently, caused some confusion. Engineering is focused on applying thinking skills based on scientific results to resolve problems in the physical world and makes great contributions on that level. Technology is not just about hardware and software but also about how to modify the natural world to meet human wants and needs. When designing materials for STEAM curriculums, all disciplines should be part of the integrated experience students will need in resolving real-life problems.

MOOCs also have their challenges. The main difficulty in designing the STEAM MOOC was the limited online course material in Arabic, whether texts or videos. Despite the flexibility and number of people who can join MOOCs, completion rates were low (5–10 percent), owing to the demanding work involved. Another drawback was related to the recognition of certificates issued by the course providers. These certificates are not always recognized by local and international governmental bodies.[42]

Egypt's experience with educational reform brings to the fore several points. Teachers need to be provided with professional development programs, such as those of STEAM PED, if they are to become agents of change. Yet more work is required to convince accrediting bodies of the merits of such programs and the advisability of recognizing them.

Teachers cannot work in a vacuum. To support teachers in adopting the state-of-the-art measures that connect student learning to everyday practices and integrate disciplines, various stakeholders—including school principals, administrators, and parents—need to be on the same page.

With the expansion of online learning around the world having turned into the silver lining of the coronavirus pandemic, universities and educational institutions are more amenable than before to adopting new teaching methods. A move toward carefully designed online and blended programs would constitute a step in the right education.

Localizing and contextualizing educational reform is imperative. Even if educational systems are within the same region, they can and should go their own way, given myriad differences from one country and culture to another. Reform that overlooks local values, cultural contexts, and real-life problems needlessly hinders its own success. For change to take root, reform must forever remain attuned to the mores and specificities of its host society.

Experimentation From the Grassroots

Political will in support of education from a country's leadership is desperately needed, but top-down reform cannot be a substitute for grassroots initiatives. The education sector in the Arab world, more than at any time before, needs transformative educational reform that responds to the aspirations of Arab societies, not governments. It must honor these societies' histories but without narrowly binding them to it. It must also help them to construct their postcolonial identities and join in the global dialogue that allows for the production of knowledge rather than just its consumption. And indeed, some of the most vital experiments today are taking place on a small scale, building on local efforts.

The necessary reform cannot be conceived and implemented without reformers adopting a system approach that takes into consideration the complexity and interconnectedness of the educational process and engages stakeholders in a participatory activity of leadership that aims to change mental models, break professional habits, and impact practices. In this reform model, key stakeholders are actively engaged in leading reform from where they each are positioned within the system (schools, community, policy, funding agencies, and universities). A central function of their leadership role is to facilitate implementation

of qualitatively impactful innovation that can trigger renewal, whether they start at the classroom, school, community, district, or ministry level. These innovative initiatives can come from a visionary funder, whether a person or an institution, or from a creative teacher, principal, parent, or student. They can also come from a dedicated bureaucrat, a policymaker in a ministry, or a researcher with an insightful discovery on how to best teach and educate. In the context of a stagnant environment like the educational sector in the Arab world, such initiatives must be considered the sector's most precious asset. A systems approach to reform will build on these assets and ensure that they are encouraged, nurtured, and supported, not by depending on any single factor (such as a visionary minister) but by encouraging experimentation in a nonhierarchical way.

Among the most pertinent challenges to adopting this reform model is the fact that existing organizational arrangements within educational sectors have become antiquated, formed as they were in previous eras marked in various societies in the region by colonialism and harshly inegalitarian orders. These organizational arrangements tend to be greatly centralized, with roles and functions that are ill-defined, and they are framed within a managerial functionalist paradigm rather than within a professional, participative, educational one informed by research and best educational practices. This is added to the fact that they operate within often oppressive, or at best pseudodemocratic, political systems that tend to be built around the authority of single individuals and in which improvement is rarely the result of a collective effort to work coherently toward a shared vision. In fact, ministries of education in most Arab states are run by politicized bureaucrats who are trained to execute, inspect, and direct rather than to creatively solve problems, innovate, and critically reflect on barriers that need to be removed to encourage and support the effective implementation of improvement initiatives.

As a consequence of such organizational arrangements, evaluation processes, if present, are punitive and fully disconnected from capacity-building for improvement. When actions or initiatives fail, people are punished or replaced instead of identifying and addressing the dysfunctionalities of the system. As a result, there is a focus on searching for existing talent to address shortcomings rather than on building capacity and modifying existing organizational arrangements and norms. This further perpetuates the status quo, as every newcomer soon becomes socialized in the very system that constrains transformative, innovative educational change. Adding to the complexity of this picture, the desperate search for talent itself has become one of the key barriers to improvement, as such the fact that personnel searches mainly target foreign talent. Local talent is rarely appreciated, and foreigners are brought in as if they carry within themselves the panacea of success that their educational systems seem to enjoy.

It is time to adopt a different approach that is more respectful of experimentation and more supportive of initiatives that come from below. Senior officials may feel that this implies a loss of control, but that is exactly the point—and we write to encourage them to see this as a

source of potential improvements rather than a threat. Education can attract idealistic individuals, and an environment in which those who can envision alternative goals and strategies thrive is essential to start walking the path of transformational reform.

The Educators-Led TAMAM Movement

Among the more notable grassroots educational initiatives in the Arab world is TAMAM, which has sought to propagate a culturally responsive, educators-led reform movement that is holistic, participative, and informed by research and best practices. The project's purpose is to disrupt the status quo by bringing the center of gravity back to schools and their communities and by building on the assets and potential capacity of educators to lead school-based improvement.[43]

TAMAM began in 2007 as a grant-funded research and development project that was part of a memorandum of understanding between the Arab Thought Foundation and the American University of Beirut. The word "tamam" means "good" or "perfect" in Arabic, and the project's name reflects its purpose: TAMAM is also an acronym for *al-tatweer al-mustanid ila al-madrasa*, meaning "school-based reform." While the initiative started in Lebanon, its activities initially encompassed nine partner schools, both public and private, distributed evenly throughout three Arab countries—Lebanon, Saudi Arabia, and Jordan. Since then, it has expanded to include seventy schools in six additional countries—Egypt, Kuwait, Oman, Palestine, Qatar, and Sudan. TAMAM includes a network of around 1,000 practitioners, including around thirty-two researchers from twelve different universities, forty-two coaches, twenty-nine interns or volunteers, and numerous policymakers, all collaboratively engaged in designing and implementing impactful school-based improvement.[44]

In response to the shortcomings of educational reform in the Arab world, a group of concerned practitioners established TAMAM. These reform attempts had failed to achieve the intended goals of building the capacity of schools to improve student learning and prepare engaged citizens capable of contributing to the development of their communities. TAMAM invites reformers to adopt a holistic approach that takes into consideration the complexity and interconnectedness of the educational process and engages all stakeholders in participative leadership that changes mental models, breaks professional habits, and impacts practices. It also develops a vision for the school that societies want—a community school with broad-based leadership and a collaborative climate that address holistically all aspects of child development—cognitive, emotional, or social.

TAMAM's goals and strategies challenge the current trend of prescriptive, top-down approaches to school reform. Instead, its school-based transformative reform model is one in which professional development and continuous inquiry play a central role. Reformers are encouraged to trigger and support innovative practices in schools through concurrent capacity building and adjustments to organizational conditions, especially at the school level. This enables school-based educators to successfully initiate, implement, and institutionalize innovative interventions and creative solutions to the impediments that students are facing in their process of learning.

In his book, *Liberating Learning: Educational Change as Social Movement*, Santiago Rincon Gallardo argues that for successful educational reform to be sustainable, it must be conceptualized and led as a social movement.[45] TAMAM subscribes to this view. In the Arab world, such reform allows innovative educators to honor the history, heritage, and cultural identity of educational institutions. An effective educational movement, Rincon Gallardo observes, emerges as a result of the efforts of purposeful actors to assert new values, form relationships and practices rooted in those values,, and mobilize economic, political, and cultural powers to translate these values into actions.

Conceptualized as a movement, TAMAM spreads professional values and norms in three key arenas—the professional and pedagogical arena, to ensure mastery in spreading such values and practices; the social arena, to encourage partnerships and build broader societal familiarity with reformist ideas; and the political arena, to remove obstacles to reform, leverage institutional power, and create the policy framework and means to implement institutional change. Most research on social movements shows that they are fueled by autonomy and creativity, require adaptive policies and agile structures to ensure a successful impact, and are built around what is called a critical community to lead and transform them from grassroots initiatives into broader purveyors of public policies.

The TAMAM model for leading reform focuses on the following drivers: the agency of all the stakeholders; their partnerships and collaborative actions as they set goals, design strategies, and implement and institutionalize these goals and strategies in a concerted way; and the innovative dimension of these actions, rooted in an ongoing process of research and development that produces contextually relevant knowledge. The drivers also include an advocacy process in which reformers employ micropolitical strategies to minimize resistance to innovative ideas at all points of the system. They do so by mapping power dynamics and transforming innovations from visions and strategies into policies and favorable organizational arrangements that balance structure with agility to support innovation and self-renewal.

Schoolteachers and administrators, together with scholar-activists, lead this movement and sustain its momentum by continuously broadening the scope of its membership. They build capacity among individuals and teams to lead change at all levels of the educational sector. This involves establishing partnerships among key advocates of the movement, promoting the visibility of views it is advancing, and conducting research to validate and generate policy

recommendations that are grounded in relevant, specific contexts and to address key challenges for reform in the Arab world. As leaders of this movement, scholar-activists conduct collaborative, action research with the heavy involvement of school-based educators. From their research, they identify critical areas of improvement at the school level, both in terms of practice and organizational arrangements, and design interventions to build individual, professional, and institutional capacity for change.

TAMAM is not designed to be a prescriptive model that is mechanically adopted at the national level throughout every country in the region. Rather, it offers a vision and coherent strategy that allow the project's design to travel: building a network of change agents; producing research-based, actionable theories that are grounded in specific sociocultural contexts to inform the design of the movement's innovative interventions and strategies; building capacity for broad-based leadership; and building partnerships and alliances to enhance and sustain the momentum of the movement toward shifting mindsets and breaking cycles of dysfunctionality.

TAMAM's network shares a vision for community schools with teachers as leaders and a profile of the graduate that reflects the aspirations of its members. Members of the network interact through monthly virtual sessions in which they share experiences and receive support from each other as they engage in innovative projects at their schools. They also work with experts on collectively initiating school-based improvements that respond to their needs and priorities. Within this network, country-based hubs have been formed, as have network improvement communities of schools across geographic locations, to tackle problems many schools face and whose root causes go beyond specific schools.

Producing grounded knowledge is done through a research lab that includes educational researchers across the Arab world. The lab uses collaborative action research to monitor the implementation of innovative interventions at all levels in a variety of Arab countries, to critically evaluate the impact of these interventions to generate research-based designs, and to ground each of these designs in the local sociocultural context. This process is aimed at bringing about social amelioration through greater equity and social justice. Additionally, building partnerships with international researchers who work on similar school-based capacity-building approaches in established research universities ensures the continuous exposure of TAMAM researchers to up-to-date best practices and subjects the knowledge produced to scrutiny from the international scholarly community for validation. Most importantly, such partnerships allow knowledge that is produced locally to become part of the global dialogue on reimagining education. Therefore, educational researchers can engage as equal partners in knowledge production, rather than merely as consumers concerned with customizing foreign-produced knowledge for their cultural context.

Building broad-based leadership capacity is the task of a large number of university-based coaches as well as TAMAM's school-based coaches using the initiative's program on leadership capacity building. The program follows a job-embedded design that begins with forming a leadership team at the school level and expanding to the building of coaching

capacity to support those schools in sustaining school improvement. The TAMAM school improvement process allows lead teams to initiate, plan, implement, monitor, and evaluate an innovative improvement project of their choice with a collectively chosen focus that aligns with their school's vision and mission. This process consists of a series of steps that entail selecting a focus, designing an intervention for improvement, planning and implementing the intervention, monitoring its implementation, and then evaluating its impact. It concludes with practitioners reflecting on the impact of the improvement initiative and then taking action in their school to introduce the necessary organizational changes in order to institutionalize this improvement. The last phase in the process sets the stage to initiate a second cycle of improvement, in which more teams are involved in professional learning with the purpose of building school capacity for leading change.

Throughout this process, TAMAM coaches guide and support the lead team's members to acquire competencies, skills, and attitudes needed to increase their commitment to direct and sustain reform and change at their institutions. In addition, TAMAM coaches continuously monitor the lead teams' progress to facilitate their professional learning. They also negotiate with school administrations to provide conditions that can ensure the sustainability of the lead team's engagement in TAMAM while developing their commitment to leading school improvement long after the gradual withdrawal of the coaches. The leadership capacity–building model also encompasses building capacity to promote school-parent partnerships and student leadership. This includes enhancing communication built on mutual respect between parents and teachers and broadening communication between teachers and their students beyond the classroom. It also includes identifying leaders among parents and students who are able and ready to collaboratively engage with teachers in leading innovative school improvement initiatives.

Building partnerships with ministries of education and government agencies responsible for school reform and professional development is aimed at influencing policies at the national level and granting to schools local decisionmaking authority, especially when it comes to implementing and sustaining innovative improvement initiatives. This encompasses demanding a form of autonomy for schools that advances a strategic proposal for improvement. To broaden the base of advocacy for the movement and increase its potential to influence policy change, TAMAM also seeks partnerships with policy institutes. Additionally, it partners with professional organizations that already support school-based improvement through capacity building. This helps to create a community of professionals that can sustain the expansion and implementation of a myriad of improvement initiatives and advocate for measures ensuring the effectiveness of their impact.

Over the past fifteen years, the TAMAM project steering team has organized around thirty gatherings for TAMAM network members, during which they came together to share their experiences and learn from each other and from the project steering team. During the coronavirus pandemic, the team held over two dozen webinars and interactive virtual sessions to enhance the professional learning of its members and orient them to seize the opportunities provided by the pandemic to innovate and initiate school-based improvement from wherever

they were located in the educational system. TAMAM's capacity-building activities have included countless coaching sessions and almost 180 training sessions offered to schools participating in TAMAM. These resulted in building the leadership capacity of more than 860 school team members and fifty coaches. With their newly built capacity and the continuous support of TAMAM coaches, school teams took the lead in initiating and implementing 100 school-based improvement initiatives targeting various aspects of the functioning of schools. These ranged from introducing new instructional strategies to new supervisory approaches to building partnerships with parents to promoting students' engagement in learning and their leadership skills. The improvement projects that the lead team members implemented were effective in achieving their improvement goals and resulted in a significant impact on students, teachers, parents, principals, and schools.

Furthermore, as a result of the research and experimentation conducted throughout its years of operation, the project steering team was able to design several training programs, some of which were transformed into online programs offered through the American University of Beirut's Continuing Education Center. These include a leadership capacity–building program, a training program for coaches, a parent-school partnership program, a community-school partnership program, a student leadership program, and a school improvement network program.

TAMAM's project steering team also engaged with regional and international researchers, coaches, and masters' and Ph.D. students to conduct research activities that contributed to the production and dissemination of a knowledge base on school-based improvement grounded in Arab contexts. The research includes studies on domains that inform the design of the TAMAM model, such as school networking, establishing partnerships with parents and the local community, building professional learning networks, contributing to policymaking, and designing scaling-up strategies, among others. Moreover, TAMAM research activities include documenting, describing, and studying the experiences of participating school teams, in addition to examining the supportive and hindering factors to school improvement and the required conditions from schools or ministries to facilitate and sustain school-based improvement. TAMAM is also conducting research on the direct and indirect impact of its capacity-building activities. To date, TAMAM has published two books, thirteen research studies, thirteen articles and blog posts, seven technical reports, two conference papers, seven master's theses, and one Ph.D. dissertation. In addition, TAMAM has systematically documented all its activities in a database that is accessible to educational researchers and practitioners to conduct further studies.

TAMAM's experiences confirm that it is possible to aim for an ambitious vision to reform education despite the historic challenges that Arab educational sectors face. Following a systemic approach that advances concerted initiatives to disrupt the status quo can generate alternative strategies, build adaptive systems, and lay the foundation for sustainability. Yet, a persistent challenge that the project has faced is establishing channels that allow it to influence policy and scale up its activities from a small network of experimental schools to all schools serving all students. One of biggest lessons learned is that leading improvement

requires dealing with anticipated and unanticipated obstacles related to the sociocultural, political, and organizational context that is being disrupted by the changes that educators are trying to advance.

While TAMAM's design is a composite of discoveries on the path traveled by the educators who embarked on it, the movement's experiences have resulted in identifying key characteristics that a reform model must have to ensure its successful use and implementation in different contexts.

- The approach to reform must frame change toward improvement as a journey rooted in collaborative inquiry, where educators, researchers, policymakers, and educational stakeholders together tackle the challenges of educational reform.

- The designs of the capacity-building programs must provide both structure and flexibility, where clear goals and guidelines are set by experts and researchers, yet the planning of improvement initiatives is left to school teams and their coaches, making them well-attuned to contextual conditions and to the urgent needs of schools.

- A deep understanding of the context in which change is initiated is essential for ensuring that improvement is responsive to needs in different contexts.

- Monitoring and data collection are key procedures to examine progress, refine existing designs, and document experiences.

- The core operations of educational research centers should aim at producing actionable knowledge and must enjoy a degree of freedom in terms of the research they conduct and the allocation of the funding they receive.

General Lessons: Why and How Should Governments Reform Education?

As the experiences from the Middle East and North Africa show, the era of focusing on building schools and enrolling students must be followed by one in which learning becomes an individual process, a lifelong enterprise, and a broad social responsibility. Education is a key element in stable and prosperous societies. It can also help shape our collective futures, and for that we need to have a broad debate in which we reimagine how knowledge, education, and learning can best happen in a world of increasing complexity and precarity.

With the multiplication of sources of knowledge, education in the twenty-first century is no longer just about the preparation of students for the job market. It is also about imparting the critical skills needed to adapt to and prosper in a rapidly changing environment with constantly emerging opportunities. In the Arab world, the currently dominant approach of rote learning and the focus on reproducing existing systems of hierarchy are incapable of providing students with these skills. In time, and without a genuine revamp, the failure of education systems will become society-wide failures that generate even greater frustrations among a younger generation and their families, creating greater instability than exists today.

An additional impetus for reform is the significant rollback in educational achievements that is visible today across the Arab region as a result of insecurity and conflict. Millions of children are either out of school or getting little to no formal education whatsoever. The coronavirus pandemic only exacerbated preexisting inequalities in educational achievements and deepened further the gap between and within countries. In war-torn countries even the resources needed to physically rebuild educational facilities are simply unavailable. The scale of the challenges and shortcomings cannot be closed by going back to the same, old-and-tried methods in education. We therefore join the call for a new social contract for education at the regional and national levels. And this contract is one that will help Arab citizens prosper while ensuring that societies build on generations of knowledge, including ancestral and cultural norms.

The Arab world's policy of imparting specific knowledge in a rote learning mode, and hoping to thereby create peaceful generations unable to question authority or uninterested in doing so, has not worked. All the results show that education in the region has been deteriorating for the last few decades. Specifically, the problems have been the following.

- A sense of inequality has grown among students of different schools, widening the gap between the haves and the have nots.
- There has been a rising sense of frustration, failure, and apathy among the young, especially if graduates are unable to find employment.
- Competition and polarization have replaced social cohesion and team-building among citizens.
- A problematic dichotomy has arisen between competence and performance, and this dichotomy has expanded.
- Students have been left with poor civic engagement and problem-solving skills.
- Stagnant educational systems have struggled to grow into environments that allow for flexibility and responsiveness in an exponentially changing world.

- Structures of oppression have been normalized through in-class teaching pedagogies that perpetuate power relations and authoritarian thinking, sidelining critical and creative thinking among students.

The end result is the development of generations of students not only lacking the skills to enter the labor force but also those needed to deal with the changing complexities of life. Instead of developing peaceful citizens, educational systems in the Arab world today are largely developing frustrated generations that are either resorting to violence or, simply, emigrating.

The earlier Carnegie Arab Horizons report touched upon all these concepts. The question today is how to approach reform in a collaborative way with governments and society, demonstrate that new educational paradigms are not designed to undermine religion or social traditions, deal with new frameworks emerging from the coronavirus pandemic, and learn from successful examples both in the Arab world and internationally. Basically, what is needed is a new paradigm for not only how we educate but also where and why.

Educational reform is necessary because it is fundamental to so much of what happens in society—in the cultural, economic, political, and even personal realms. It is difficult for that very reason. If approached as a technical exercise of finding the best textbook or sequence of education, in mathematics let's say, then it will be easy—but it will also offer a meager payoff. If it is approached as an essential social task, it will necessarily have to engage many constituencies, none of them united, including bureaucrats, students, politicians, teachers, employers, and parents. However, it must be approached by engaging all these stakeholders. Change mandated from the top that bypasses the experience of those who are expected to implement it provokes not only resistance but also a lack of coordination. These constituents must be seen as participants rather than obstacles. That is easier said than done, but this complexity also offers opportunity for pockets of innovation, local experiments, and policy entrepreneurship in favorable localized settings. And that is precisely we have been trying to highlight. Teachers, parents, and students have been improvising and adapting to problems as they have arisen. The coronavirus pandemic has magnified preexisting problems with regard to access and inequalities, but it has also forced even more improvisation.

Such an approach should encourage a search for positive deviance. It provides an opportunity for evolution from below rather than imposition from above. We have presented some ideas in the specific examples provided earlier. For instance, the Egyptian case suggests a recentering of the focus away from solely emphasizing STEM toward seeing literacy, broadly understood, as more than a sidelight or building block. International practice suggests that reading, writing, and developing skills in those areas are integral to all phases of learning. Therefore, educational reform should embrace an interdisciplinary approach to learning that factors in a more holistic and integral understanding of the complex interactions between governance, economics, culture, and social development. And there is much that we have not fully explored but that offers profound opportunities for innovation. These include

newer fields such as green education, or older ones such as philosophy or religion, which should be incorporated into a holistic approach to curriculum development. In a cynical age, education is still a field where optimism and idealism are powerful motivators.

Signposts Toward an Ideal Educational System

We close with a set of recommendations—not a blueprint for an ideal education system, but a set of signposts that can help guide those responsible for developing one.

For national leaders, there is a need to redouble the commitment to educational reform and to shift tone but also to sit back. Education needs to be a priority not merely when voicing platitudes but also when it comes to budgets and decisionmaking as well. Rhetorical commitments must be married to material ones. But this needs to be justified not in terms that make it sound as if the goal is a society of obedient writers of computer codes but rather terms that fully embrace the full set of citizenship skills and train people to engage with both technical skills and with society and each other. And leaders need to relax their grip a bit, allowing pockets of innovation and loosening up the very centralized nature of governmental educational structures.

International actors, for their part, can support experimentation. Their role is not to further international transfers but to foster transnational linkages. In an earlier generation, international actors were expected to provide funds, expertise, and models. This represented a movement of resources, ideas, and techniques from the Global North to South. Such an approach is no longer appropriate. Resources are still needed in much of the Middle East and North Africa, of course, but some countries hardly qualify as parts of the Global South, in terms of fiscal capabilities at least. Nor is there a successful global model that can be moved from one region to another—or even from one part of the Arab world to another. Reformers need to build supportive networks, not hierarchies. Indeed, as we have observed, those networks already exist (especially as students and graduates travel), but they need to be more consciously developed so that they do not simply focus on technical matters or the recruitment of teachers in a manner that siphons off the more qualified to the wealthiest countries. Networks should also support cross-fertilization, not a mechanical transfer, of ideas, pedagogical innovations, and strategies of engagement.

The responsibility for the design of educational facilities, approaches, and pedagogies still falls on the shoulders of educational leaders—officials and scholars. But these leaders also have to share it. There is a need for spaces that encourage reform, collaboration, and

partnerships. There is also a need to forge linkages to community organizations as well as political linkages to agencies not part of the formal educational hierarchy. This should not only take place at the top of the state; it should also take place at the local level, in order to anchor the system more in the concerns of direct stakeholders. Rather than deliver answers, scholars and officials should facilitate society-wide discussions of why and where we educate.

And teachers have to be encouraged to practice what they should be preaching and make learning a lifelong process. Credentialing and some continuous training are necessary, but they can also become bureaucratic. The most effective step here would be for those supporting teachers to stop speaking of "teacher training"—as if there are fixed sets of techniques to master—and start thinking and talking in terms of "professional development," with teachers as active participants in innovation and reform.

Finally, broader publics, including parents and students, should view educational institutions less as places of delivery and more as locales in which they are to be active participants. Parents will likely never lose their concern for their children's economic futures. Many students will continue to regard schools as important social sites, not just as educational ones. Such outlooks are inevitable; they are also healthy for as long as they lead to a sense that students are responsible stewards rather than demanding consumers.

But how should these stakeholders come together to negotiate a way forward? Perhaps one underappreciated factor that has blocked reform has been the silos in which discussions have taken place. National leaders communicate the need to compete, educational officials can speak in ways that are overly bureaucratical, and experts can speak in terms that are unintelligible. This often leads to dialogues that revolve around platitudes rather than focusing on practicalities.

We close then with procedural suggestions designed to prompt the necessary interaction. Our emphasis has generally been bottom-up in this report—bringing local experimentation to regional attention—but the task must be to bring the top-down and bottom-up approaches into dialogue. The former must move beyond regarding education as either too technical for political dialogue or a magic bullet that will resolve economic challenges such as unemployment. The latter must discover locally appropriate ways to move from individual experimentation to broad-based reform. National dialogues—the formal ways of bringing together officials, specialists, teachers, parents, and students—can provide an atmosphere to showcase innovation and move education from being a technical enterprise to one that is a broad, joint social responsibility.

And national dialogues must be supplemented by regional ones. We do not suggest simply gathering Education Ministry officials together. Such meetings occur and should continue. But they have to be supplemented by broader and more public forums, again with the aim of ensuring wider participation and attention. There are common problems and regional particularities (for instance, the balance between Arabic and English in education), and the systems are linked at the grassroots level in various ways. Teachers and students move

across national borders; educational degrees and certificates are valid beyond their country of origin; regional labor markets ensure that training in one country affects which skills workers bring to another country.[46] The point of such regional dialogues, however, would not be to reach a single regional model, curriculum, or set of standards. There is likely to be tremendous variety in national needs. Instead, the purpose would be to make national borders as porous to good ideas and innovation as they are to workers, information, investors, and cultural production. In broad terms, the path forward is clear. But the steps to adopt will always be in the process of discovery. All those involved need to use this not as an excuse for stasis but as an impetus to action.

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