

Innovations in Education

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Powerful lessons in the digital age

Technology is not the silver bullet that solves all problems, but it helps, says **Amy Kazmin**

In the past two decades, the world has entered ever more children into school with the aim of giving them the skills to lead productive lives.

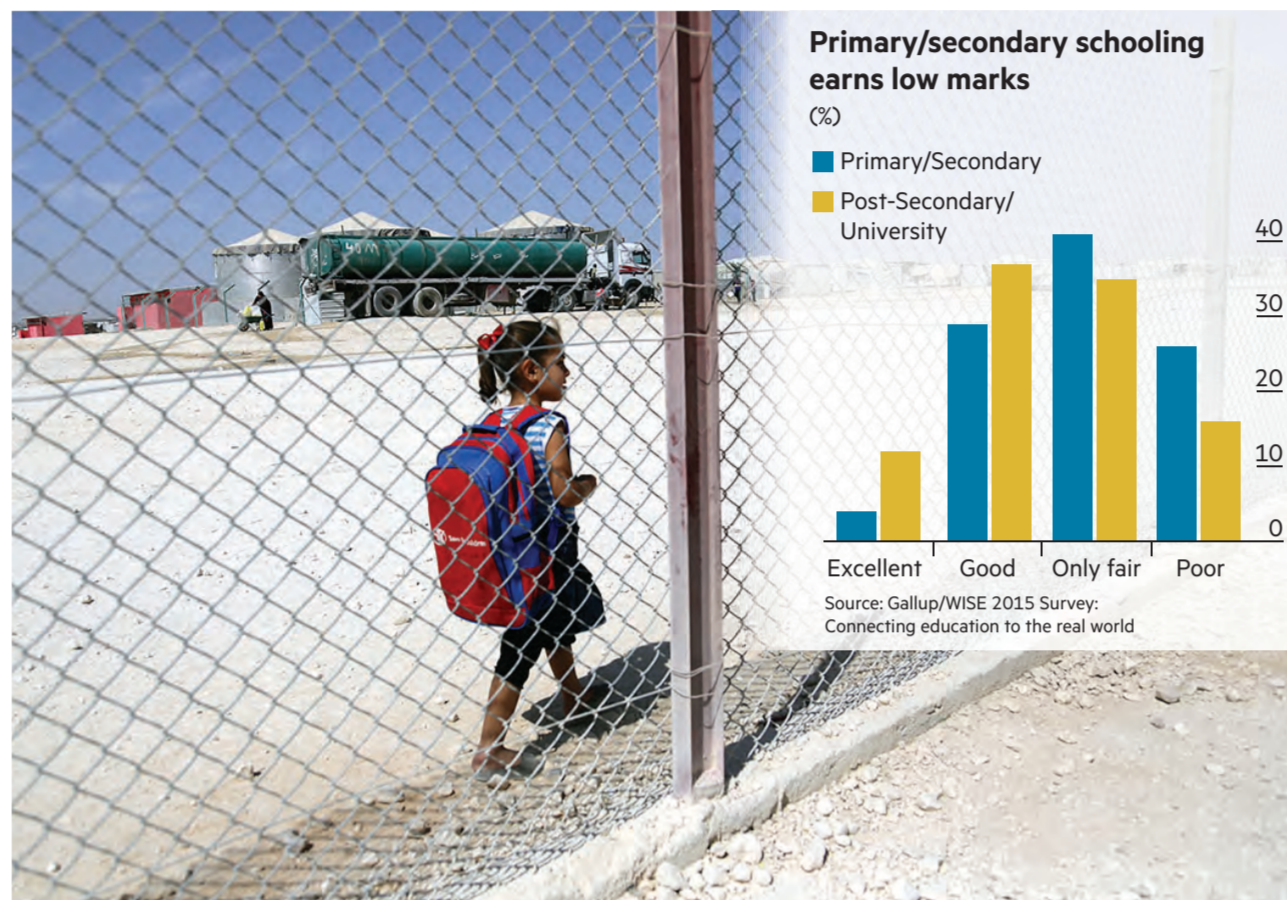
Some 91 per cent of children in emerging economies are in primary school, up from 83 per cent in 2000. The number of kids not in class has fallen to 57m from 100m worldwide in 2000. Secondary school enrolment has also jumped. Yet effectiveness remains a challenge for education the world over.

This is why global attention is turning to the next big educational challenge: ensuring that pupils are equipped to participate in the workforce in an era of rapid technological change.

"The issue of quality is increasingly on the list of international policymakers," said Maryanna Abdo, emerging markets education director at Parthenon-EY, a consultancy. "There is a recognition that your economies cannot survive and thrive without educated populations."

At present, many school systems are hindered by stretched financial resources, poorly-trained teachers, unimaginative curriculums, and outdated pedagogical approaches that often focus on rote learning.

Filling children's heads with facts, rather than developing critical-thinking abilities, is too often a priority. Such drawbacks are reflected in pupils' low levels of learning, and high dropout



Mixed results: more refugees are going to class (see page 2) but schooling worldwide receives poor marks — Save the Children

rates. Globally, fewer than 80 per cent of primary school students even complete six years of education. Parthenon-EY estimates that 250m children now in school will leave without basic literacy and numeracy skills. In India, the Pratham Education Foundation reckons that more than half of fifth-year students cannot read a simple story from a year-two textbook fluently. About 75

per cent of third-year students cannot do simple, two-digit subtraction.

It is not only developing countries that face educational challenges. The US and many European countries are wrestling with the needs of disadvantaged children — whether poorer pupils or newly-arrived refugees (pages 2 and 5). In the digital era, technology is seen as a powerful tool to bridge some of the gaps

in education. Around the world, as this report shows, charities, social enterprises and governments are experimenting to see which techniques can improve learning by children — as well as by adults.

The US-based Literacy Bridge initiative has developed a Talking Book Program, using audio computers to give illiterate farmers in Ghana information

on health and best practices in agriculture. Indian billionaire Nandan Nilekani has created EkStep, or One Step, which is hoping to tackle some of India's educational challenges with an integrated digital platform that can tailor content for children's individual needs.

The tool is intended for use by a range of "caring adults," whether family members, NGO workers, or schoolteachers who lack the time to provide enough individual attention to detect and rectify weak areas in pupils' performance.

Yet experts warn that the adoption of new technology must be accompanied by innovative thinking about what education means, what skills are required and how students should be taught (see articles on pages 4 and 5).

"Technology is not going to be the silver bullet that solves all problems," says Debasish Mitter, India country director of the Michael & Susan Dell Foundation, an American non-profit group. "It's not enough to say we have put a TV in the classroom that plays great videos. The objective has to be how does tech blend in and support how a child learns."

Mr Mitter also argues that innovations in teacher training, pedagogical methods, and other aspects of education must be studied rigorously to ensure that ideas which seem captivating in theory have the desired impact on the ground.

Or as Julia Gillard, the former Australian prime minister, writes in this report, "education and innovation are inextricably linked" but they do not automatically "form a virtuous circle". "It is important to absorb the lessons of what has not worked . . . to help us find solutions that will."

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Innovations in Education

World must avoid 'expensive distractions'

OPINION

Julia Gillard

Innovations bring hope. Be it a new technology to extract water, to harvest crops, to deliver vaccines or to educate a child, inventiveness and ingenuity spurs human development, growth and prosperity. It is not surprising that when innovations fail, they leave us disappointed.

Education and innovation are inextricably linked; one is not possible without the other. But they do not always form a virtuous circle with enduring benefits. Which is why it is important to absorb the lessons of what has not worked in the past in order to help us find solutions that will.

Perhaps the most widely known education failure of recent years was the One Laptop Per Child programme to distribute low-cost, low-power computers. First heralded as a way to unlock technology and the opportunities

it brings, the project failed to deliver widespread improvements in children's learning.

In Peru, which conducted the largest instance of the One Laptop Per Child programme, the Economist reported that only 13-30 per cent of seven-year olds reached required learning levels, in spite of improved access to hardware and \$225m spent.

On a recent trip to east Africa, I was not surprised to see a classroom full of already dated computers, but I was taken aback by a room full of unused pianos gathering dust. No doubt a gift from a good person or company looking to make a worthy contribution, they were not only a waste of resources but an expensive distraction sapping valuable time of already overworked teachers and administrative staff. Delivering new technologies and learning materials is a good thing. But these examples should teach us to be wary of promises of silver bullets.

The 2015 WISE Education and Job Market Survey results show that education experts rate their country's educational system more highly for teaching core academic subjects, rather than a variety of "real-life" skills, such

as entrepreneurship. Teaching the basics is essential, but our children should be learning broadly and thinking deeply.

We can only innovate for better quality however if we solve the challenge of ensuring children go to school. Through the Millennium Development Goals, the international community promised the world's children universal access to primary school education by 2015. Yet almost 60m children were left behind in this endeavour.

In September, world leaders agreed Global Goals for Sustainable

Julia Gillard: The Global Goal for education is more ambitious than its predecessor — and will cost money



Development, and the ambition is even greater. Goal 4 requires leaders to focus not just on sending children to primary school, but also ensuring that a full 12 years of schooling plus pre-primary education are inclusive, equitable and of good quality. Our sights are now set

on greater access and better quality. Both are vital when we know that about 250m children in developing countries either do not make it to the fourth grade or are failing to reach basic levels of literacy and numeracy by then.

If such educational building blocks are not achieved, how can we expect a reasonable level of human development in these communities?

The debate about how to improve quality in basic education is lively, as it should be. I strongly believe that the debate must be informed by regular and reliable measurements of results. This is particularly important in developing countries. The only way effectively to measure children's progress is through quality assessment. Well-designed tests shine light on barriers to a quality education: if we do not understand what is going wrong, we have no hope of fixing it.

Measuring learning is controversial, no matter where you live. But it is a discussion we must have as part of our efforts to meet the new Global Goals. There are gaps in our knowledge about why children are failing to learn the basics. We need innovative tools that

help us answer such questions.

Expert organisations and think tanks such as the Brookings Institution in Washington DC and the Global Partnership for Education are working towards solutions, and attracting more and more partners in these efforts.

I hope that as we begin the campaign to fulfil the Global Goals, we see an even greater innovation effort focused on how to measure success and how to assess barriers to quality so that we can improve children's learning in poor and developing countries.

In order to understand what works, we will need more money. We know that billions of dollars in new funding is required. Unesco estimates that the funding gap is about \$40bn per year. This gap cannot be filled by traditional donor countries alone. What we need now is engagement and commitment to education by new donor nations, the private sector, foundations and philanthropy. New financing must also leverage increased expenditure on schools by developing countries.

As we look beyond 2015, let us turn our efforts to giving children quality education, rather than unused laptops and dusty pianos.



Indian children taught by Edutel

Case study
Animated learning helps boost success

Growing up outside the small south Indian city of Hubli, Harsha Mahabala played with many poverty-stricken rural children whose parents saw little value in sending their children to free but poor quality state schools.

His parents — owners of a small bakery company — sent him to a private boarding school.

Today, Mr Mahabala, 32, is chief executive officer of Edutel, a Bangalore-based social enterprise using satellite technology to try to give all Indian students access to high-quality education. For the past year, it has beamed classes in science, maths and English — taught live by specialist subject teachers in studios — to primary and secondary pupils in 1,000 state schools in rural Karnataka.

So far, children's learning has improved and exam failure rates have dropped. Karnataka is now expanding the programme to a further 1,000 schools, with plans to scale up to 10,000. Other Indian states are watching closely, with an eye to improving their own struggling rural schools.

"Children can be anywhere, whatever their financial background, but if they have open skies, they should get a good teacher," says Mr Mahabala. "Everybody is coming and visiting us and saying 'let's do a pilot here as well!'"

Edutel — partly-owned by the Michael & Susan Dell Foundation, a US charity — is also beaming its courses into 300 low-cost urban private schools, popular with working-class parents hoping to improve their children's prospects.

Indian school enrolment is at an all-time high, but children still struggle with difficult conditions. In rural schools, teachers must deliver lessons on multiple subjects for children of different grade levels and ages every day.

But Mr Mahabala believes technology can help students overcome any disadvantages. At present, the company, which both designs and delivers lessons, provides all participating schools with five classes a day.

The Karnataka government pays Edutel Rs16,000 (£160) — equivalent to one teacher's salary — per school per month.

Edutel's teachers are a mix of young educators and wizened veterans. Their carefully-scripted verbal explanations are supplemented by strong animated visuals to illustrate concepts in science and maths. "If you have to learn, 'how does a pulley work', for a teacher to draw it on the blackboard and explain it, is very difficult," Mr Mahabala says. "Showing it in animation is much more attractive."

Amy Kazmin

Refugee crises spark push to prevent a 'lost generation'

Emergencies Lobbyists want to make education a priority for displaced children. By *Miranda Green*

Campaigners call it the lost generation: the children of families displaced by war, natural disasters and other catastrophes who are in danger of missing out on an education.

Across the world, the extreme circumstances faced by refugee children are proving a spur to innovation in how to deliver ad hoc education — sometimes in refugee camps, sometimes on the move.

At the same time, campaigners are trying to persuade donors and policy-makers to rethink their response to natural or man-made disasters so that they include education as a routine part of humanitarian aid. Less than 2 per cent of aid is spent on education and NGOs say it often falls between the two main pillars of intervention: crisis plans offering food and shelter, and long-term development.

After years of decline, the number of children without access to education has been on the rise again over the past four years. The Ebola outbreak in west Africa, for example, forced 5m children out of school — a little-noticed side-effect of the crisis. Nearly 60m children currently have no schooling, and half of them are displaced from their homes or living in fragile, conflict-hit states.

Temporary solutions often turn into permanent ways of life — an entire childhood might be spent in camps, or parked in host communities — and NGOs are trying to adapt. The crisis in Europe sparked by mass migration from Syria across and around the Mediterranean has brought further complications.

"The most pressing problem is the Syrian refugee population in neighbouring countries, and on the route into Europe," says Gemma Parkin of Save the Children UK. The NGO sets up games and educational activities in what it calls "child-friendly spaces" at Italian ports where coastguards bring in survivors of boat crossings from north Africa.

This emergency reception is backed by mobile early-years units along migrant routes in the Balkans, and tented children's centres at major transit cities. Teaching staff and child psychologists "try and re-engage children with the concept of learning as soon as possible", says Mrs Parkin.

Gordon Brown, the former British prime minister and now UN special envoy for global education, is pushing for better funding for emergency education. His wife, Sarah Brown (pictured right), describes

how diplomacy works with small-scale schemes to force change in agencies and charities.

Her own organisation, Theirworld, can, she says, push innovative interventions and influence the big aid donors. Some of this work involves sophisticated, high-level lobbying backed by powerful popular campaigns — the global #upforschool petition, for example.

"Based on my view from inside government looking out, there are moments in which small groups of very powerful people can make a decision that really affects millions of lives," says Mrs Brown. During those pivotal moments and for those powerful people, education must be an aid priority.

This lobbying work draws on research from around the world. Based on schemes in Latin America, Theirworld has pushed for a simple change to absorb more children — double-shift schooling. Now established in Jordan, Lebanon, and in Nigeria where families have fled Boko Haram insurgents, the system is becoming an accepted way for host countries to adapt to refugees' needs.

But the barriers between refugee children and school attendance make some of these solutions unrealistic. Boys can find themselves working too young, or even recruited into militant groups. But girls face worse — once displaced from their homes, NGOs say they are more likely to be trafficked or forced into early marriage. After that, frequent pregnancies and family responsibilities make it almost impossible for young women to resume schooling.

According to Mrs Brown, smaller organisations working with global businesses or groups on the ground can experiment and keep the development world responsive: "The major NGOs cannot invest in R&D because of how they are funded — they can't take risks and cannot afford to fail because people have given their donations. They have to spend money in the safest way."

She cites the Wedding Busters of Pakistan — groups of young women and girls who lend one another support and speak out if a family discusses early marriage. The scheme is funded by the Global Business Coalition for Education — Sarah Brown is executive chair. The organisation is run with ITA, a local education charity.

But for Justin Forsyth, Save the Children's chief executive, private sector know-how is needed just as much as corporate cash. He wants "to harness technology, so refugee children have access to wifi and can grab knowledge themselves".

There are signs of fresh thinking. This year's OpenIDEO "refugee



Catching up: Bayan, aged five, attends class at Zaatari refugee camp in Jordan — Save the Children

'These children are Syria's future — it's our job to equip them with skills'

When Jordan's Zaatari refugee camp was set up in 2012 to provide temporary shelter for Syrians fleeing civil war, the humanitarian plan included a need to build schools.

But, according to Save the Children's Mohamad Al Asmar, who has worked in Jordan for the past three years, there was no discussion about what to offer younger children. So his NGO approached donors with a scheme to provide three to five-year-olds with safe spaces to play and learn. Now Mr Al Asmar says 2,000 children graduate every term from the Save the Children kindergartens, to begin elementary school well prepared.

"This may not seem like a large number, but it's a big investment in Syria's future," he says. "These young children need normality, and who knows, they might be the generation

that will be running the country after it opens up."

Places are limited because young children need a generous staff ratio and healthy snacks — "It's very expensive," Mr Al Asmar explains.

In past refugee crises, the youngest children have tended to miss out on education. This persuaded Bulgari, the Italian luxury jeweller, to fund three Zaatari kindergartens.

Unusual partnerships such as that with Bulgari, Mr Al Asmar believes, are the future of refugee education, because of ever-changing needs and high dropout rates. Arsenal football club's charitable foundation has built a pitch and sports centre in the camp, which attracts boys to activities and keeps them engaged.

This informal approach is key with the older age-group: teenagers who

have witnessed violence may drop out of school. A rebellious and sometimes fatalistic attitude can make them difficult to lure back into the classroom.

For pupils aged 6-13, camp schools operate a shift system: boys learn in the morning, girls in the afternoon. But art therapy and other psychological support, as well as academic catch-up lessons, are available out of hours in family centres.

Zaatari, with 80,000 occupants, is evolving into a near-permanent home for tens of thousands of displaced Syrians. Mr Al Asmar hopes the children will find a livelihood and opportunities to study — he wants universities to send scouts to find academically-gifted refugee children. But for now, he adds: "This is Syria's future, and our job is to equip them with the skills they will need." MG

Ideas Box The peripatetic classroom

Technology and design are providing some of the most exciting approaches to the problem of educating the increasing numbers of children displaced by war or other crises.

Designed by Philippe Starck for the French charity Bibliotheques Sans Frontieres, the Ideas Box is a portable media centre with its own power source, that fits neatly on two pallets. It can be assembled, its developers claim, in 20 minutes.

Brightly coloured containers, robust enough for extreme settings, open to create a 1,000 sq ft space filled with desks (the reconfigured boxes), computers, e-readers, screens and even paper books and basic processors such as Raspberry Pi.

Content is customised depending on the destination.

"It's like a circus arriving in a village," says Mr Starck. "All of sudden these people come with colourful suitcases... and in every suitcase there is wonder, stories and images. And it's fun — there is a carnival atmosphere."

So far, the Ideas Box has been used by Congolese refugee children in the African Great Lakes, and at a camp in Jordan sheltering refugees from Syria.

But the charity plans to expand these projects. The box is also deployed in Australia's Aboriginal areas and in urban neighbourhoods where educational attainment is low in Paris and New York. MG

education challenge", a global competition to find and test innovative projects, put Africa at the fore.

Two separate schemes, one in Ethiopia and one in Kampala, use sport to tempt children into informal education. Another in Chad gave refugee women from Darfur training to help young children with trauma.

But two more focus on the problem all NGOs and campaigners agree is crucial: teacher training. One is designed so that teachers can help refugee children make the transition to formal school, and another, tested in the vast Kakuma camp in Kenya, is pioneering a mobile mentoring scheme by Columbia University's Teachers College.

Refugee populations often include teachers — and that is positive, says Sarah Brown. But she warns: "If you are going to introduce all these innovations, they have the training and support. It always comes back to the teachers."

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Innovations in Education

Circle time beats exam coaching

School 21 The east London institution is experimenting with democracy. *Helen Warrell* joins in with morning assembly



Happy clappers: pupils sitting in circles are never isolated, says headmaster Peter Hyman — Daniel Lynch

In Stratford, east London, 75 six and seven year-olds are watching *The Simpsons* in their school assembly. Once the recording has finished, the year threes are asked how things could have been different for the mischievous Bart if he had been more like his studious sister, Lisa, and shown "good behaviour for learning" at school. One pupil rises from her seat on the floor to suggest that, with a more applied attitude, Bart might not have spent the day lounging on the sofa.

For the founders of School 21 — which opened three years ago as a government-funded but autonomous "free school" — this focus on the act of learning is central to its teaching philosophy. The headmaster, Peter Hyman, once an adviser to the former UK prime minister Tony Blair, was determined to set up an institution that prepared students for the 21st century — hence the name.

Located in one of London's most deprived boroughs, the school will eventually take pupils all the way from age 4 to 18 with an emphasis on ensuring high achievement for all, regardless of background. Teachers prioritise the development of listening, speaking, and questioning, and breaking down the barriers between subjects so that children learn skills, rather than narrow facts.

Pupils are taught the value of "craft", and released from the traditional diet of exam coaching to produce exhibitions which combine their studies in history or geography with art or music. Their goal every day is to produce "beautiful work", Mr Hyman enthuses as he bounds around the classrooms on a whistle-stop tour.

"Of course, it's important getting good grades," he concedes. "But if that is seen as equating to a good education, then we're failing whole generations who are

going into a world that's far more exciting, fluid and entrepreneurial, and requires all these different attributes which employers are looking for."

Still in its fledgling phase, the school feels like an experiment in progress. It currently has just four primary year groups, reception to year three, and four in secondary, years seven to 10. Some of the ideologies — such as the notion that each class must produce a public exhibition each term — are borrowed from fellow innovators at High Tech High, a chain of Charter schools in California specialising in new ways to teach science, maths and engineering.

School 21's corridors are filled with past projects: the year nines have brought their cold war studies to life by modelling clay busts of key figures — including Lenin, Thatcher, Gorbachev, and Putin — displayed on a chess board to give a sense of strategic manoeuvring. Younger pupils have made 3D representations of chemical reactions, inspired by ArcelorMittal's *Orbit* sculpture in the nearby Olympic Park.

Other elements of the school credo

are Mr Hyman's own. Pupils always sit in circles. "If the 20th century was about rows, the 21st century is about circles," he explains. "They're about unity, equality and democracy, whereas in a row you can end up isolated on the end, or stuck at the back."

The school has developed a distinctive "oracy" curriculum, aimed at elevating speaking skills to the same level as reading and writing. "We're training every teacher, because talk is learning and that talk aids thinking and it makes students more articulate," Mr Hyman explains.

Within three years of opening, the school is significantly oversubscribed, receiving about 650 applications for the 75 places available in each entry year. Admissions are managed according to how close a prospective pupil lives to the school. But the real test of its methods will be whether pupils are receiving good enough results to progress into higher education or training.

The first GCSE grades will not be out until the end of next year, and SATs — or standardised tests — scores not until

2018. In the meantime, Mr Hyman says the year twos have already performed "excellently" in national tests, achieving well above the national average. He has also received uncharacteristically giddy praise from the UK schools watchdog Ofsted, whose preliminary report last year graded School 21 "outstanding" in every category.

Joe Pardoe, a humanities teacher and head of project-based learning, explains that open discussion on teaching methods has been central to his experience at the school. "Any teacher can come into a lesson any time," he says. "The challenge here is to keep adding new things and innovating, experimenting and changing your approach constantly."

It helps that he is constantly learning himself — giving the example of a joint history and music project he is pursuing with another teacher, which melds studies of both slavery and the blues. "That's what you get when you escape a culture of box-ticking," Mr Pardoe says. "It's not about dictating from the top down... it's about what we all individually can bring."

Crowdsourced videos plug gaps in Arab world

In his home-made video using computer graphics to explain the solar system, Sayed Obaied, an Egyptian student, dodges meteors before he meets a cartoon alien in a spaceship, who introduces the planets.

Mr Obaied, now in his first year at university, made the short film for Nafham, a crowdsourced online educational service which relies on volunteer teachers, students and parents to supply videos explaining lessons to children in Egypt, Saudi Arabia, Syria, Kuwait and Algeria.

"I have benefited from Nafham in understanding my own lessons," says Mr Obaied, who has made some 130 videos in the past three years. "When I explain lessons to others, it helps me retain the information I have learnt."

The brainchild of three young technology professionals, Nafham was launched in 2012 to address dire shortcomings in the Egyptian education system, where 19m pupils are educated in overcrowded and overstretched schools. Poor teaching means most parents resort to private tutors in order for their children to pass their exams. Egypt was recently ranked 139 out of 140 countries for quality of primary education in competitiveness rankings issued by the World Economic Forum.

According to official figures, Egyptian families spend between \$2bn and \$3bn a year on private lessons, often given by the same tutors who teach their children inadequately at school. The cost is a burden on families and a problem that successive governments have promised — but failed — to resolve.

"Since the birth of my son, I have been dreaming of changing the way children are educated

using my experience in technology," says Mostafa Farahat, co-founder. "I needed to address the problem of my son's education and [more generally] the gap in available ideas for online education in the Arab region."

According to its founders, Nafham, which has a staff of seven, covers more than 90 per cent of Egyptian curricula, 65 per cent of Saudi curricula and around 30 per cent of all school subjects in Kuwait, Algeria and Syria.

The website has 500,000 active users every month who clock up 5m page views and 3m lesson views — double last year's figures. Students make up 80-90 per cent of visitors, the rest are teachers and parents.

"We have the biggest educational channel from our region on YouTube with 125,000 subscribers," says Mohamed Habib, co-founder and chief operations officer.

Nafham relies on a group of some 25 teachers to check the accuracy of content provided by contributors. It provides help and advice to its amateur video makers to improve quality, but will often carry more than one video focusing on the same lesson so as not to discourage contributors.

"There are usually alternatives for each video and with time, we see quality improving," says Mr Habib.

Sayed has no doubt that Nafham was good not only for his education, but also for his personal

development. "I have learnt presentation skills, how to film and how to use a computer to alter images," he said. "You can see the difference in quality if you compare my first videos to the later ones. I advise everyone to use the

Nafham website." **Heba Saleh**



Co-founder: Mostafa Farahat

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Innovations in Education

Boom time for private financiers

Funding Investors are stepping in where the state has struggled to meet demand. *Jon Elledge* reports

In November 1975, Nasreen Mahmud Kasuri, a mother in the Punjabi city of Lahore, concerned by the quality of local schools decided to open her own. Forty years later, the Beaconhouse School System is one of the largest private school chains in the world, teaching nearly 250,000 students in nine countries.

Beaconhouse has a handful of schools in the UK. But the vast majority of its teaching happens in the developing world, in countries such as Malaysia, United Arab Emirates and Indonesia, where demand for private schools is apparently insatiable. The number now operating in Pakistan alone is thought to be well into six figures, notes Kasim Kasuri, Beaconhouse's chief executive and son of its founder.

"Even if they only pay Rs100 a month [62p], most parents would prefer to send their child private."

In the past few years, privately-financed education companies set up shop, hoping to emulate Beaconhouse's success by offering reliable education in countries that have struggled to provide it. Some, such as Dubai-based school chain GEMS, began life as family businesses but have since attracted private equity investment. Others, like the online higher education platform Coursera, were launched by a new generation of venture capital-backed "educators". All believe it is possible to match the financial return demanded by investors with the social return gained from educating the world.

Part of the explanation for this boom is that demand for education is higher than ever before. As a recent report on the sector from the consultancy Parthenon-EY, *Driving grades, driving growth*, notes, there is a strong correlation between the proportion of a country's population educated to degree level and its economic growth rate.

Globalisation is also behind demand for both internationally recognised



Higher education hub: EduCity Iskandar in Johor

Western outposts encouraged in Malaysia

In many emerging economies, demand for private education is driven by consumers. In a few places, however, national or regional governments are buying in western provision, to plug gaps in the existing education system.

Malaysia identified higher education as a strategic economic sector in the 1990s. The government-backed Iskandar Investment Corporation has established EduCity Iskandar, a 350-acre campus in Johor. Teaching on the

campus will be provided by outposts of nearly a dozen educational institutions, including Reading and Southampton universities in the UK.

Malaysia already plays host to 150,000 foreign students. By 2020 it hopes to increase that number to 200,000. The goal is to turn Malaysia into a regional hub for higher education. Dubai's International Academic City hopes to do the same for the Middle East. **JE**

qualifications and English language skills. In India, notes Ashwin Assomull, one of the report's authors, "it's hard to get a job in a business process outsourcing company without a basic degree".

Many developing countries have struggled to keep up with demand. Reports of poor teacher attendance are common. In Pakistan, Mr Kasuri notes, many rural schools exist only on paper. Choosing a private school, even one with only a nominal fee, creates accountability. The sector as a whole has attractive characteristics for investors. Schools come with relatively reliable

revenues: once children are in school, parents will try exceptionally hard to keep them there. And high barriers face new providers at both school and university level, in the form of regulation and the need to create curriculums.

Say's Law of markets seems to hold true in the education sector. The larger the share of a population that completes school, the greater demand will be for university placements. The greater the share of a population that holds a degree, the more likely employers are to demand one. But for some the greatest

appeal might be the warm feeling investors experience when they are helping to change lives. Michael Needley is founding partner of Sovereign Capital, a London-based mid-market private equity house for which education has long been a key sector. In recent years, he notes, "the institutional money that's interested in investing in education has become broader. Wealthy people are now talking about donating."

Some companies – notably Coursera and the Bridge International Academies chain of low-cost private schools in Africa and Asia – have been funded through a combination of traditional venture capital and socially-minded "impact investment".

But where decent schools cost money, they can entrench economic inequality. There is also a tension between the social function of education and the profit motive: in the developed world, weak regulatory regimes have sometimes enabled private colleges to charge high fees for worthless qualifications. However big the private sector, the onus to ensure opportunity and assure quality will fall on the state.

For these reasons, a large private education sector is still often regarded as a mark of state failure, rather than economic vibrancy.

But Katelyn Donnelly, of the Pearson Affordable Learning Fund, which invests in education start-ups, downplays the tension between quality and profit. "Education is a long-term investment, and quality and success in business are linked if you're going to get it right." In other words, it is results that attract parents and pupils. This focus on pleasing the customer can also drive private providers to be innovative, in a way state institutions rarely are. The Parthenon-EY report describes this as the "try fast, fail fast" mentality.

Perhaps the greatest benefit from privately-financed education is that it encourages expansion. Margins in the education business are low: "You only make money when you get to scale," says Mr Assomull. That means good providers will be driven to open more classrooms and spread learning in their drive to win profits. Perhaps Beaconhouse will not be the last school group to teach a quarter of a million children.

Cashing in on the need to succeed proves a lucrative business for some

A deep recession might not be the most advantageous economic backdrop for a company offering student loans. But for Ideal Invest, a Brazilian student loans company that claims to be the biggest in the country's private sector, the doldrums afflicting Latin America's largest economy have been a boon.

The reason? A much larger rival government student loan programme, known as Fies, has scaled back under a federal budget austerity programme. As access to the government programme has been tightened for students, the private sector has become more attractive.

"These changes have been very good for us," says Gabriel Haddad, finance director of Ideal Invest.

The company was founded in 2001 by Oliver Mizne, a young entrepreneur who wanted to use financial markets to increase access to education for Brazil's lower income groups. It followed the opening up of Brazilian higher education to the private sector in 1998. Deregulation led to a proliferation of private universities catering partly to students from the new lower-middle classes. Between 2002 and 2012, the number of students in tertiary education in Brazil doubled to 7m.

To encourage growth, the government strengthened student loan schemes, culminating in Fies. Until the end of last year, deals were offered with favourable terms, such as a heavily subsidised interest rate and practically unrestricted access. Private universities had a field day, attracting new students and financing them through Fies. The number of students who signed up each year rose almost 10-fold between 2010 and 2014 to about 732,000.

"By offering extremely attractive conditions (3.4 per cent annual interest rate; 5.5 years of grace period), the program... lowered students' sensitivity to prices," Credit Suisse said of Fies in a report. The education companies took advantage of this, not only to "post sound growth



Choice: loans for Brazilian students

rates but also to increase margins."

Ideal Invest, meanwhile, started out by offering working capital finance to private universities before, in 2006, moving into student loans under the brand name Pravalor. The company has since set up partnerships with about 200 universities, representing about 50 per cent of private undergraduate students. Since 2006, it has signed up more than 50,000 students through loan programmes worth more than R\$1bn (£167m).

The company offered finance to students who did not qualify for Fies, perhaps because the government option was not available for the course or university. And it offered terms that some found more attractive. These included a shorter repayment period of about 2.5 times the length of study. The student started paying half the tuition fee per month from the start of the course. Often, interest is paid by the education institution.

To enrol in the programme, Ideal Invest demands the participant has a cosignatory for the loan, usually a parent, who earns at least twice the monthly tuition fee. It uses a proprietary credit scoring model that takes into account the student's planned course, the university and his or her academic performance to judge creditworthiness.

Ideal Invest funds the programme by issuing notes for an asset-backed securities programme. Investors include Victoria Capital and EOS Investimentos. The World Bank's private sector investment arm, the International Finance Corporation, also has equity in the company.

Joe Leahy



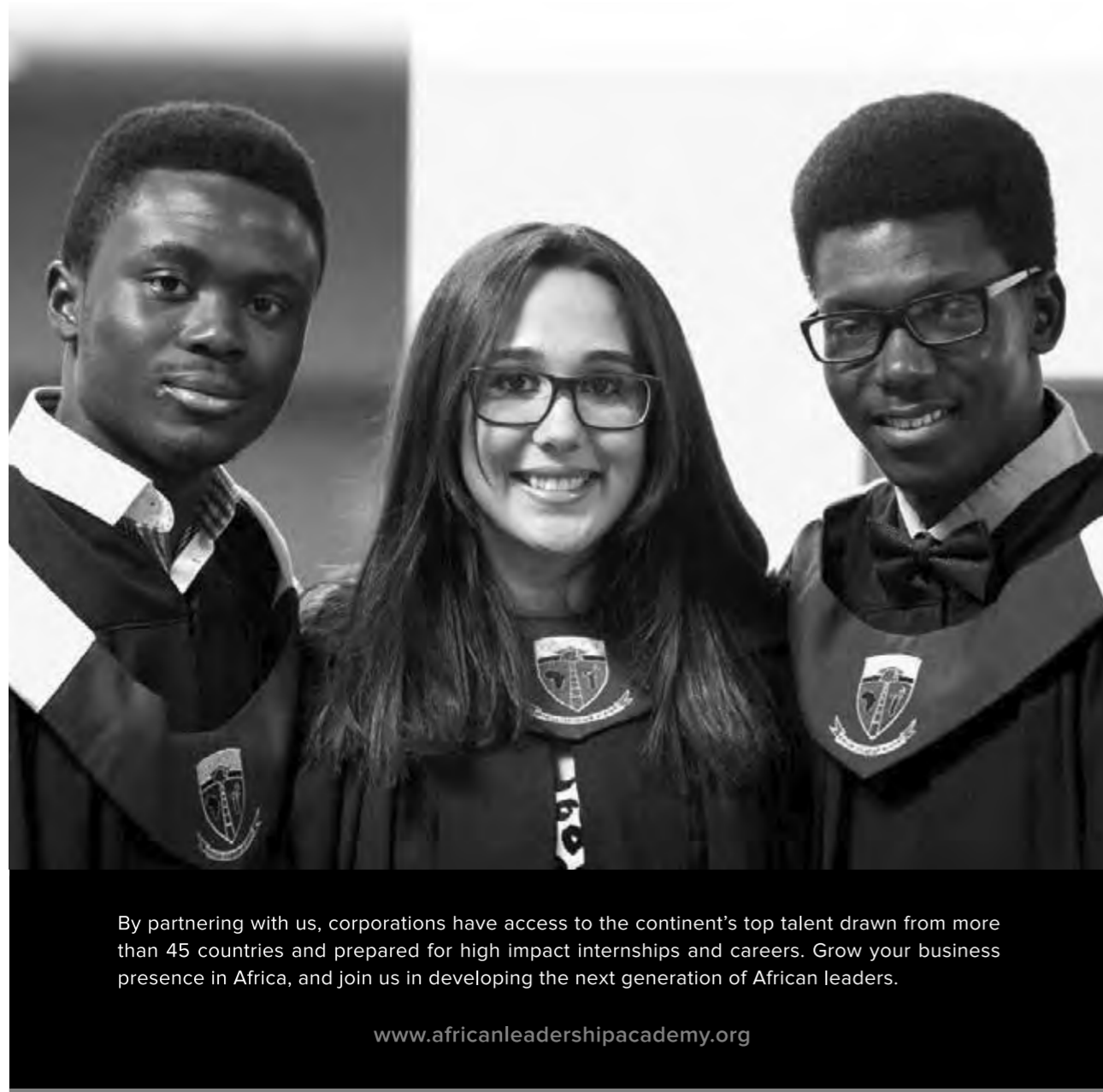
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Asia's success has become more than a numbers game

Numeracy

Experiments focus on either the top or the bottom of the class, reports *Miranda Green*

The west, mesmerised by China's rapid rise to economic superpower, is looking east to tackle a lack of numeracy in class and in the workforce.

Western maths pupils at 15 are more than a year behind peers in leading Chinese cities, Singapore, Japan and South Korea, international comparisons show. Meanwhile schools, colleges and employers are confronted with a stubbornly consistent 15 to 20 per cent of maths under-achievers in every cohort.

"Personalisation" has been the buzzword in western school systems in recent decades: tailoring the pace and content of lessons to the needs of pupils moving at different speeds. But far from helping the bottom quintile, educationalists believe this approach has reinforced the erroneous idea that maths is simply beyond some children – not least in their own heads.

"There is no developmental or cognitive reason why... under-achievers cannot succeed," says Alf Coles, who researches maths teaching at Bristol University. Now, the trend is toward "whole-class" Asian teaching techniques: each stage of a more limited set of topics is reinforced, with a lot of confidence-building repetition and extra attention for the least able.

Researchers in Dr Coles's department describe it as a learning "spiral", looping back to reinforce understanding, rather than traditional western methods of pushing the more able ahead to other topics, while leaving others to repeat what they failed to master earlier.

Dr Coles, observing classes in the Chinese city of Macau this year, noted other unusual features: unlike in elementary and primary schools in the west, maths teachers are specialists teaching only their own subject, with plenty of time set aside for one-to-one support. "From a UK perspective, it can seem [the pupils] are making slow progress," he says. "But there is something really challenging about this – to say it's no longer OK to just let this bottom group get left behind."

In the US, imported textbooks from Singapore now sell in bulk, where once they appealed only to a few far-sighted



Models: maths pupils in Macau are under international scrutiny – Gamma-Rapho/Getty

What is 'Asian maths'?

In Asian classrooms, confident understanding of each stage of maths for the whole group is regarded as more important, and more beneficial to all, than differentiated learning according to ability. "Depth over breadth" is the approach, with more time spent on fewer subjects. Teachers plan lessons in which all pupils progress at the same pace once they have mastered each concept. Stragglers are picked up with extra support, often outside the lesson. **MG**

home educators. At the UK's Ark group of academy schools, run by the hedge fund industry's international education charity, a programme called Maths Mastery has been spun out into a course that can be adopted elsewhere. An independent assessment found a small but positive effect on the five and 11-year-olds it studied: the children made a month's worth of extra progress compared to peers. Further benefits are expected in later years, with a significant increase in the number of pupils enjoying their subject.

A report by the UK's Education Endowment Foundation warns that these methods are "no silver bullet". Some educationalists remain sceptical

about what they see as a fad. Perhaps, doubters ask, it is the use of specialist teachers that really makes the difference in Asian schools. Or the time spent helping pupils in difficulty.

Conrad Wolfram, founder of computerbasedmath.org, has a deeper worry – that national tests and international rankings are measuring skills soon-to-be obsolete in the digital age. "Quadratic equations and long division are not of much use in today's workplace," he wrote in the FT last month.

Nathalie Sinclair, a researcher in maths education at Simon Fraser university in Canada, also worries about the content: an emphasis on numbers in elementary schools and on algebra in secondary schools has, she argues, left out the need for spatial reasoning, required for professions ranging from engineering to computing. "From the sandpit to Minecraft, they come to school with these abilities and then we squish it out of them."

Other maths pioneers have decided to concentrate on the upper end of the ability range. Kings College London Mathematics School, inspired by Russian specialist schools, challenges 16 to 19-year-olds selected for "enthusiasm as well as attainment". In its first round of public exams this year, 97 per cent of pupils achieved an A grade.

Professor Alison Wolf, an academic at the university sponsoring the school, says both students and teachers benefit from finding their maths "tribe" – to quote a parent. All this begs the question of how far western schools can progress without a change in wider cultural attitudes.

Innovations in Education

‘Somebody always says it will not work here’

Interview Pioneer Brett Wigdortz tells *Miranda Green* how he defies low expectations in trying to improve the life chances of poorer children

For a crusader, Brett Wigdortz is on the mild-mannered side. But the chief executive of Teach First is still, after 13 years at the helm, fired up by his organisation's mission: to improve the life chances of children from poor backgrounds by putting first-rate teachers into their schools.

“Everyone in Britain has to see educational disadvantage as a crisis,” he demands. Only a third of 16-year-olds from the UK's most deprived households achieve the minimum five grades at C or above regarded as the international benchmark for success in public exams (GCSEs). Mr Wigdortz describes the particular and general failures of the system to help them do better as “huge tragedies”.

“This is an individual tragedy for the young people involved and a national tragedy that we are losing 40 to 50 per cent of our kids, who aren't really going to be employable.”

Mr Wigdortz has been motivated since 2001 by how the decks are stacked against poor pupils. The then McKinsey consultant was put on a pro bono project on how to break the link between poverty in London and low attainment at school. He came up with the idea of creating a social enterprise to raise the quality and prestige of teaching in the most challenging state schools.

Six months' leave from the consultancy to turn his plan into reality turned into a long-term commitment, dual citizenship for the New Jersey-born Mr Wigdortz, and a place among the most respected educational pioneers in the world.

Teach First began recruiting top-performing graduates from the most prestigious universities to teach in London's low-income areas. Each young teacher undertook to spend two years in



Tackling a tragedy: Brett Wigdortz in his central London office — Charlie Bibby

the most difficult classrooms in the country, in exchange for a tempting menu of mentoring, support and contacts with the elite employers who sponsored the organisation.

This September, the programme reached the last outlying schools in England and Wales to become nationwide. It is the largest graduate recruiter in the UK and “Teach Firsters” have taught more than 1m pupils.

Through partners at Teach for All, co-founded by Mr Wigdortz and the head of the US scheme Teach for America seven years ago, this same approach is targeting educational inequalities across the world.

Global comparisons sometimes leave him amused at the fatalism that can

afflict even the most reform-minded partner. “I've been in over 20 countries, and in every one someone in government or somewhere says: ‘You don't understand, this place is unique — very different — and here are the reasons why it won't work . . .’ Everyone has their own excuses.”

Examples of pedagogical brilliance around the world stand out. On a recent trip to India he watched a young Teach for India graduate in Mumbai hold the attention of 106 pupils in a dirt-floor room, tailoring simultaneous lessons for several ability groups. “One of the best lessons I've ever seen.”

But Teach First's approach, based on high-quality teaching and defying low expectations, can only scale up to meet

He is often left amused by the fatalism that can afflict even the most reform-minded partner

the world's education challenges, he says, if governments lose their obsession with “structures and systems” and instead focus on recruiting, training and supporting the right people.

In countries that consistently score well in international education rankings — Finland and Singapore, for example — teaching is a prestige occupation. And while money has not been poured into large salaries, these champion systems lavish spending on professional development to prevent the exodus that is hitting the profession elsewhere.

“If governments just focused on getting the best teachers and the best leaders, then these people themselves could innovate,” argues Mr Wigdortz. As a social entrepreneur, Mr Wigdortz

happily embraced endorsement and grants from government ministers — but he guards his organisation's independence carefully. Politicians, however well-intentioned, are captive to a short-term mindset, he says.

“Ministers move on every few months,” he complains, adding that in more authoritarian, centralised states such as China and Singapore, it is easier for schools to avoid being buffeted by change. In democracies, he believes those facing voters must strive for cross-party agreement. “If you look at the best education systems, one political party on their own can't do it.”

“There is no perfect system,” says Mr Wigdortz, “and education has historically not been good at sharing best practice.” But learning from other systems could be crucial in the next few years, because so many problems are common to all — and interventions come too late for some children.

The shortage of teachers in maths and science subjects is a global crisis. “Is there a technological solution we haven't looked at yet?” he wonders.

Other nations with recruitment and retention problems could learn from at least one Teach First innovation — the organisation has changed the tone of its advertising after psychological research by the UK government found applicants responded better to the idea of taking on a tough challenge, rather than to appeals to their social conscience. And money, he warns, may become a barrier for some top graduates now that private sector salaries, kept in check since the financial crash in 2008, are rising.

In general, Teach First's recruits get their rewards from the work and the children, he says — 63 per cent stay for at least three years and the majority stay involved in education. This is in spite of Teach Firsters who emerge from the first tough few months with hair-raising anecdotes.

As for the man at the vanguard of this movement, he seems wary of the idea that only an American faced with class-bound English schools could have done it. But he admits that a reformer needs “naïve optimism” that can infect others.

“Maybe sometimes being a bit of an outsider and being a bit naive helps people to see what is possible.

Children are ‘digitally adrift’ even in wealthy countries

Technology

Even pupils in rich countries go astray with computers, finds *Miranda Green*

“Technology is the only way to dramatically expand access to knowledge,” according to Andreas Schleicher, director for education and skills at the OECD, the club of developed nations.

But his own organisation this year confused educationalists the world over with a report revealing complex failures in the global effort to make technology an aid to learning.

In some wealthy countries, children with good literacy skills were not necessarily confident and effective users of the internet. Elsewhere, a lack of basic reading skills was preventing children getting the most from online learning. Frequent computer use at school even led to 15-year-olds doing worse in test scores than their peers — a finding that gave a boost to families and schools that ration or ban screentime.

Technology and imaginative design can provide new solutions to the problem of education in remote parts of the world — particularly for students in crisis-hit areas or developing nations. But some in the developed world see children, even in education systems with good test scores and a high level of investment in technology, unable to navigate the web effectively.

Too many pupils are, in Mr Schleicher's words, “digitally adrift”.

Some tech commentators believe the teaching world and technologists are at loggerheads. The utopian dream of digital education has been stymied, they argue, by policymakers and innovators taking different directions: the former want to buy in solutions that reinforce the way education has always been done; the latter want to disrupt and overturn education in a riot of personalised learning and invention.

“Our technology-enamoured society has led to an over-focus on creating new technologies for schools, and insufficient attention being paid to developing wholly new models of schooling,” says Austin Dannhaus, a strategist at the San Francisco design studio Free Range.

Jim Knight, a former UK schools minister and now chief education adviser at TES, an education resource company,



Five innovations around the world

TeachPitch, UK

A cloud-based library that helps teachers worldwide find and share the best online resources.

eduTechnoz, Canada

Curriculum-based games for children aged three to seven learning Arabic. Invented by an IT professional whose five-year-old was not enjoying his homework.

Nafham, Egypt

Crowd-sourced educational video content for school curricula through a website, app or smart TV (see page 3).

The Talking Book Program, USA

Farming communities in rural Ghana share information via a small portable audio computer.

Videobooks for Deaf Children, Argentina

Video stories told in sign language, with a voiceover and subtitles for hearing families to share.

example, were introduced into most UK schools in the past decade through a government procurement agency, now abolished.

“Whiteboards proliferated across the system,” says Sir Kevan Collins, chief executive of the Education Endowment Foundation (EEF) in London, which researches effective new classroom tools and practice. “To this day we have no idea whether they improved things.”

Imaginative use of technology can come to the rescue, and dramatically improve access to learning in remote, rural areas — even when the equipment is hardly cutting edge. For example, remote lessons pop up on screen in front of classes in Montevideo, led by teachers in north London through education videoconferences company RNLC.

And individual schemes hold out the promise that technology can improve the basic skills the OECD maintains are the bedrock of both tech and offline success. The Education Endowment Foundation is to fund a study of computer games designed by Oxford university researchers to boost mental arithmetic in primary age children.

“Technology tends to work where it supplements the teaching, not replaces it,” says Sir Kevan, whose foundation believes schemes are most effective when they help pupils practise and reinforce skills. One low-cost reading accelerator game added five months to progress — and the pupils enjoyed it.

Another EEF study is looking at a Harvard university scheme to encourage parental involvement — schools use SMS text messages to give families open-ended questions that encourage reluctant teenagers to discuss their lessons. But students, says Mr Knight, need more: the opportunity to be proficient technologists themselves.

Israel, and South Korea traditionally led the way in teaching computer science. But now the core curriculum in UK schools includes basic processing and coding — a move applauded by both the tech industry and the “maker movement” of digital experimenters. Basic coding and processing are now required of even five and six-year-olds.

“Education is always going to be a human business,” says Jim Knight. “These things will only ever be tools. The competition of the future is not with China but between people and robots — we, the humans, need the competitive edge.”

HIGHER EDUCATION MEETS INNOVATION IN TUNIS

First “English speaking” university in French-speaking Tunisian educational system, South Mediterranean University leads the region in innovative fusion of curricula and culture.

By Dr. Mahmoud Triki

With human capital as the main determinant of the level of competitiveness of companies and countries, higher education has emerged as the most essential component for a sustained economic development.

Universities and their ability to innovate and adapt curricula to the creative disruptions in our economies are faced with two principal challenges and opportunities:

— Keeping pace with technological advances, integrating the technological breakthroughs in their programs and enabling executives to upgrade their skills;

— Offering their students and other partners (professors, corporate sponsors, and civil society institutions), a “global education” which enables them to succeed in a globalized economy.

Universities today must become aware that the education sector has been transformed from public service provided mostly by governments to a strategic sector driven by the rules of competition.

A great number of universities in developed countries have thus reviewed their development strategies and internationalized their programs. Some have opened campuses abroad; others among public institutions have privatized certain parts of their programs, while many have signed partnership agreements with universities in different parts of the world.

In most developing countries, however, the education sector continues to be managed by governments and suffers from the burden of administrative rules.

However, some of these countries have been able to adapt and to consider the opportunity offered by the new world economic order.

Since 2000, Tunisia, the small North African nation that had surprisingly kick-started much of the change in Arab nations governed in non-democratic ways, has introduced forward-thinking legislation to promote the development of private universities and provide financial and fiscal incentives. Today, the country counts more than 60 private universities, some of which are setting new standards in higher education.

The Tunisian objective is to make the country an educational destination of reference. In this framework, at South Mediterranean University (SMU), the university I founded in 2002, we wanted to position our institution and Tunisia as an active operator in what I like to call “The International Market of Knowledge”. We have federated behind our “English speaking” university — the first in the French speaking Tunisian educational system — a number of progressive and value-based corporations and business leaders as “financial partners,” and scholars and professionals as “technical partners. Contrary to the conventional rules by which universities offer programs traditionally targeting students and develop purely academic programs (mostly undergraduate then graduate), the Mediterranean School of Business (MSB) at SMU initiated its first program by organizing a world-class Executive MBA program. Using its newness, and

the emergence of a re-born nation with democratic aspirations and excellence as our guide, MSB at SMU has invited professors from top ranked business schools and signed partnership agreements with prominent universities including the University of Maryland, Babson College, and the University of South Carolina. It was after the graduation of three classes of Executive MBAs that SMU launched its undergraduate program targeting talented high school students from North African countries.

Some critics opposed the idea of creating an English-speaking university in a French-speaking educational system. Others warned that starting with Executive Education might lead to the perception of SMU as a vocational training institution and not as a university of learning and independent critical thinking. In the end, almost all were surprised that our Executive MBA at SMU would surpass the great demand for a global education. Another advantage of our strategy resides in the fact that our EMBA alumni are the employers of SMU future graduates.

Today, the Executive MBA and the Masters in Business Management at SMU are accredited by the London-based AMBA, and counts an alumni network of around 500 executives from 28 nationalities. The success of this program and the network of high-profile partners have greatly facilitated the introduction of the undergraduate and graduate programs of the Mediterranean School of Business at SMU. It has also facilitated the new development of an engineering school at SMU (The Mediterranean Institute of Technology — Med-Tech) which is now offering programs in Information Technologies and Renewable Energies. And lastly, with the development of the Languages and Cultures Institute (LCI) SMU has added a deeper achievement in the Humanities to our initial business orientation.

With the SMU schools combining education in “Management,” “Engineering,” “Languages and Cultures,” and the collective network of partners, SMU constitutes a platform for the training of internationally-minded entrepreneurs with a North African experience. The focus of our teaching and research activities revolves the specificities of our fusion of African and Arabic cultures. Considering Tunisia's strategic location as the bridge between two continents, SMU aims at being an educational catalyst between developing and developed countries and the meeting point for African students and emerging business leaders as well as students and researchers from Europe and North America enticed by the innovative growth and extraordinary promise of today's Africa.



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