

# FLASHES

A MONTHLY MAGAZINE ON KNOWLEDGE AND DEVELOPMENT  
BY MOHAMMED BIN RASHID AL MAKTOUM FOUNDATION

JUNE 2016  
ISSUE 20

#2016YearOfReading

## Another dimension

The futuristic office 3D-printed in Dubai



### CHANGING THE SUBJECT

Does maths education need a radical rethink?

AED10

### TOUCHDOWN TEACHERS

Championing STEM through American football

### ANIMATION NATION

The Emirati studio making the first Arab manga movie



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## FOREWORD

Dear readers,

It was a delight to attend the launch of 'Reading is Positive Energy', a year-long literary exhibition for all to enjoy.

Housed in a marquee in Dubai's Za'abeel Park, it features an array of Arabic-language books, a cafe, seating and interactive displays.

Air-conditioned, of course, it's the ideal spot in which to while away the hours with a novel and a cup of coffee.

We've planned a varied schedule of workshops, talks and discussions for the months ahead.

The initiative was organised by MBRF in partnership with Dubai Electricity and Water Authority (DEWA) in line with the directive of His Highness Sheikh Khalifa Bin Zayed Al Nahyan, President of the UAE, to promote reading as a vital element of the country's transformation into a knowledge-based economy.

Coinciding with the drafting of a national reading law, it forms part of a wider strategy to unite numerous literacy projects under one umbrella.

The written word underpins all advanced societies and projects such as Reading is Positive Energy support efforts to strengthen Arab culture in the UAE and across the Middle East and North Africa.

Since ancient times, the region has been a hive of innovation and scientific research – some of its oldest cities are renowned for their contributions to such noble endeavours.

I invite you to visit the facility and hope you enjoy this issue of *Flashes*.

---

Jamal Bin Huwaireb  
MD of Mohammed Bin Rashid  
Al Maktoum Foundation



## Futuristic 3D-printed office wows the world

A 3D-printed office is Dubai's latest record-breaking innovation.

Thought to be a world first, the fully functional workspace comes as part of a drive to develop technology that cuts costs and saves time.

The printers – used industrially and also on a smaller scale to make digitally designed, three-dimensional objects

– are rarely found in construction, and the one-storey prototype has attracted media attention from across the globe.

“We implement what we plan and we pursue actions, not theories.

“The rapidly changing world requires us to accelerate our pace of development as history does not recognise plans but achievements,” said

His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai.

Based off Sheikh Zayed Road, near Dubai International Financial Centre, the arc-shaped structure was built in 17 days at a cost of about Dhs 500,000. Plans for the project were announced 12



months ago. In the short term, it will house Dubai Future Foundation, an independent research body launched in April. In addition to providing a workspace it may be used to host exhibitions, workshops and conferences.

The building was made using a special mixture of cement fed into a 6m by 37m by 12m printer following reliability tests carried out in the United Kingdom and China, where a residential development was 3D-printed last year.

Labour costs were halved; one person was employed to monitor the 3D printer, while seven people managed the installation of building components on-site and a team of 10, including electricians, looked after the engineering side.

Studies estimated the technique could cut construction time by 50 to 70 per cent and labour costs by 50 to 80 per cent, said His Excellency Mohammed Al Gergawi, Minister of the UAE Cabinet Affairs & The Future.

He added that the emirate's strategy was for a quarter of new developments to be constructed this way by 2030.

"It's not just a building – it has fully functional offices and staff," he said.

"We believe this is just the beginning. The world will change."



**Above:** His Highness Sheikh Mohammed Bin Rashid Al Maktoum and His Highness Sheikh Hamdan Bin Mohammed Bin Rashid Al Maktoum, third and fourth from right, relax in the centre's minimalist chairs

**Left:** Sheikh Mohammed stands outside the space-age structure



## Arab Media Forum places ethics on the agenda

*Sheikh Mohammed meets the Middle East media's leading lights*

Journalists, broadcasters and social media leaders met in Dubai to help shape the industry's future landscape.

More than 2,000 delegates took part in a jam-packed programme of events including book signings, film screenings, talks, panel discussions and workshops.

Humanitarian concerns were high on the agenda, with speakers advocating accurate, balanced and responsible coverage of conflict, terrorism and migration.

Hussein Kneiber, Paris bureau chief of Al Arabiya News Channel, shared his experience of covering the refugee crisis in the impassioned talk 'Towards Good Media Coverage'.

Asserting that "good media coverage means unbiased reportage", he said journalists covering such important issues had a responsibility to "tell the real story" while at the same time helping to mitigate against refugee suffering during a time of rapid regional change.

Digital technology was also a source of debate, from a panel discussion on its impact on journalism practice to developments in social media such as live video-streaming service Periscope.

While social media is awash with upsetting news, not to mention malicious rumours, it also

offers plenty to smile about, said Sharjah writer Sultan Al Qassimi.

The prolific tweeter, who appeared on *TIME* magazine's 2011 list of the year's '140 Best Twitter Feeds', said such technology was often used for worthy causes, from promoting culture and the arts to protecting the environment.

Speaking at a session titled 'Engaging the Arab World and the West: Using Social Media for Good', he said: "We need to focus on the positive side of social media rather than the negative side."

Many speakers flew in to attend the event including Leila Zergeti, the editor-in-chief of Algeria's *Algomhoreya* newspaper, Lebanese news anchor Saeed Eid and the vice president of Mauritania's Journalists' Association, Uk Kulthoom Mustafa. Mark Toner, deputy spokesperson for the United States State Department, travelled from Washington, DC to deliver a talk titled 'US-Arab Diplomacy: The Way Forward'.

The Arab Media Forum took place at Dubai World Trade Centre on 10 and 11 May. Now in its 15th year, the event is organised by Dubai Press Club, an industry networking group created with the support of His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai. ↗

**Above:** His Highness Sheikh Mohammed Bin Rashid Al Maktoum, centre, takes a keen interest in the event, which he attended with His Highness Sheikh Hamdan Bin Mohammed Bin Rashid Al Maktoum, Crown Prince of Dubai

**Opposite page:** Her Royal Highness Princess Haya Bint Al Hussein spoke at the event, as did Jordan's Deputy Prime Minister, Nasser Judeh



## ARAB JOURNALISM AWARD

In a ceremony concluding the two-day event, held at Dubai World Trade Centre, Sheikh Mohammed paid tribute to some of the Middle East and North Africa's most talented reporters.

The Arab Journalism Award opened with a screening of a short documentary about the life of its founder, Khalfan Al Roumi.

Sheikh Mohammed presented this year's winners with their prizes and his poem *Hope* was recited by popular Iraqi singer Kadhim Al Saher.

## THE WINNERS

**Media Personality of the Year:** Abdul Rahman Al Rashid, former general manager of Al Arabiya News Channel (Saudi Arabia)

**Best Newspaper Column:** Ibrahim Al Arees (Lebanon)

**Smart Journalism Award:** Hespress (Morocco)

**Humanitarian Journalism Award:** Naema Al Saridi; *Almaghrib Today* newspaper (Morocco).

**Specialised Journalism Award:** *Al Khaleej* newspaper team (UAE)

**Sport Journalism Award:** Rida Saleem; *Al Ittihad* newspaper (UAE)

**Cultural Journalism Award:** Mustafa Obada, *Al Ahrām Al Arabi* magazine (Egypt)

**Investigative Reporting Award:** Huda Zakaria and Mohammed Al Mandarawi, *Al Youm al Sabe* newspaper (Egypt)

**Business Journalism Award:** Osama Jalal; KUNA (Kuwait)

**Political Journalism Award:** Dr Abdullah Al Madani; *Al Ittihad* newspaper (UAE)

**Press Interviews Journalism Award:** Faisal Bin Saeed al Alawi, *Al Watan* newspaper (Oman)

**Photojournalism Award:** Mohammed Turkman, Reuters (Palestine)

**Outstanding Cartoon Works Award:** Muwafaq Rushdi, for work shown on Sky News Arabia

**Young Journalist Award:** Abeer Isa, Kul *Al Usra* magazine (UAE); Ayat Al Habbal, *Al Masri Al Youm* newspaper (Egypt); Haleema Abrouk, *Akhbar Al Youm* newspaper (Morocco)



## Chill out with a good book this summer

*Reading is Positive Energy offers a relaxing way to broaden the mind*

Dubai residents seeking respite from the summer heat have a new space in which to chill out.

Named 'Reading is Positive Energy', the marquee is split into zones offering a tranquil environment filled with Arabic-language titles suited to people of all ages.

But there's more to the scheme than meets the eye. MBRF has paired up with Dubai Electricity and Water Authority (DEWA) to promote a love of literature, with interactive exhibits and a host of activities planned for the year ahead.

Speaking at the launch, His Excellency Jamal Bin Huwaireb, managing director of MBRF, said: "Today we offer the our community the Reading is Positive Energy exhibition to spread a culture of reading throughout society by offering a distinct set of events that are specially designed to stimulate a love of reading in both the young and adults.

"We believe that the exhibition will help create a knowledge-based generation that is aware of all the developments taking place around them."

### INNOVATIVE DISPLAY

The exhibition is housed in an air-conditioned tent spread across 1,000 square metres. Located by gate 2 of Dubai's Za'abeel Park, it features a display of literature by Emirati authors and

publishers. At some point, this will be replaced by works from across the Arab world.

Used and rare books are also on show, and activities will include workshops and competitions. Meanwhile, the 'Smart Reading Corner' showcases the latest devices including e-readers, tablets and audio guides – all available to make the written word accessible to people in any place and at any time.

The 'Emirati Majlis' area was set up to host visiting authors for book signings and readers. At the 'Coffee and a Book' corner, visitors can also enjoy light refreshments.

### FUN FOR YOUNG ONES

Children are amply catered for with the 'Knowledge World' corner, where they're being treated to storytelling sessions – and parents and nannies are welcome to join in.

Another feature, the 'Reading Sensory Wall', helps youngsters to write their own stories using their sight, touch and hearing.

Several schools have planned class trips to the exhibition, making it an ideal place in which to promote MBRF's 'Arab Reading Challenge'.

This ambitious initiative, which got underway early this year, aims to foster a love of books across the Middle East and North Africa, with

**Above:** His Excellency Saeed Mohammed Al Tayer, managing director and CEO of DEWA, cuts the ribbon as His Excellency Jamal Bin Huwaireb, managing director of MBRF, stands to his left

**Opposite page:** Youngsters attending the launch check out the children's books on show



certificates and prizes offered to children and adults when they complete a set number of titles.

Pupils who attend the tent are being encouraged to read, summarise, analyse and discuss the works they consume; a variety of games is also provided to sharpen their focus and analytical skills.

Finally, the 'Today's Children Read for Yesterday's Children' programme pairs little ones with teenagers and young adults. As the kids read to their older counterparts, they gain confidence and the reassurance from those they look up to that books are as cool as any computer game.

His Excellency Marwan Al Sawaleh, Undersecretary of Ministry of Education, commended the initiative, the strategic cooperation and concerted efforts of federal, and local, government organisations in the UAE, adding that the department would support the initiative by organising educational trips for the students to the exhibition. †



### A SERIOUS OBJECTIVE

Reading is Positive Energy isn't only for recreation; it fits into the UAE-wide strategy of developing a knowledge-based economy. Bin Huwareb highlighted work to introduce the UAE National Reading Law, which will form part of the far-reaching National Policy for Reading. Key government agencies would be involved, he added, and their individual responsibilities made clear.

Another aspect of the policy is the National Reading Strategy, backed by a Dhs100 million fund, adopted by His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai.

Bin Huwareb added: "The strategy carries through to 2026 and includes 30 main national initiatives sectors, including education, health, culture, social development and the media and content industries.

"Additionally, as part of the new initiatives, every year a month will be dedicated to reading. There is no doubt that these significant steps in the development of knowledge and reading in the UAE reflect the country's transition to a new phase of development based on the diffusion and transfer, and production, of knowledge.

"Efforts are on to create a generation capable of accommodating other cultures and expressing their culture in a civilised manner by making reading an

integral part of their daily lives." His Excellency Saeed Mohammed Al Tayer, MD and CEO of DEWA, said: "It is our pleasure to cooperate in this vital project with the Mohammed Bin Rashid Al Maktoum Foundation, the leading organisation for disseminating, transferring and localising knowledge. The foundation launches several initiatives to contribute to building a knowledge-based society to support the vision of His Highness Sheikh Mohammed Bin Rashid Al Maktoum, to further reinforce Dubai's position as a global city with a strong knowledge-based economy."

Positive societal change could be achieved by "raising a cultured generation of readers who contribute to enhancing the country's cultural development", he added.

"His Highness Sheikh Mohammed Bin Rashid Al Maktoum once observed that 'A reading society embraces civilised values, is flexible and adaptable and has the intellectual capacity to drive development to take a role in our multicultural world'.

"These words summarise the vision of our wise leadership to build a reading society in the UAE." Al Tayer added: "Our combined efforts will bear great results for future generations and will create a role model for an Emirati reader, thinker and innovator. This will contribute to building a brighter future for generations to come."

## Nobel Museum Exhibition set to go on tour

### *MBRF signs agreement to take project to other Middle Eastern countries*

MBRF, the organiser of the 'Nobel Museum Exhibition', has signed a memorandum of understanding with Nobel to host the exhibition in a number of UAE emirates as well as other countries in the Arab world and beyond.

His Excellency Jamal Bin Huwaireb, managing director of MBRF, said consultations are taking place with authorities in several cities of the UAE, as well as Arab and Islamic nations, to determine the next destination for the Nobel Museum Exhibition. He added that the Nobel Museum Exhibition in

other cities will be organised under the same theme of the annual session in Dubai and will be managed by the authorities in those cities, in collaboration with MBRF.

He also pointed out that the third edition of the exhibition in February 2017 will focus on physics.

The second edition of the Nobel Museum Exhibition came to a close on 30 May. Held at Children's City at Dubai Creek Park, the event, which explored the legacy of the many Nobel laureates in medicine or physics, attracted

thousands of visitors of all ages. It was the second year of the initiative, which highlighted major milestones in the history of medicine and physics in an accessible and interactive way.

The Nobel Prize Series 2016 event enabled students, teachers and members of the public to meet several Nobel laureates and hear them speak at panel sessions and lectures. These were intended to encourage young people to embrace creativity and innovation and, in particular, to consider pursuing careers in scientific research. †

## Algeria plans ahead for a post-oil economy



**Left:** Randa Abu al-Hassan of the United Nations Development Programme speaks at the event in Algiers

Participants included Dr Hajjar's representative, Noureddine Al Ghawali, and UNDP's deputy resident representative in the country, Randa Abu al-Hassan.

As they discussed the study's merits and methodology, they stressed the need to focus on knowledge skills, especially fluency in written and spoken Arabic, and said the index could have a direct impact on unemployment.

Abu al-Hassan insisted the index represented a major leap forward in the regional development of a knowledge-based economy, from monitoring and analysing progress to the building of key tools to diagnosing development issues. It also supported the creation of strategies to spread knowledge and achieve sustainable human development in all communities, she added.

Noureddine Al Ghawali said Algeria's Ministry of Higher Education welcomed the index's contribution towards measuring regional knowledge levels and said such projects highlighted regional achievements in the knowledge arena.

The workshop's second session, moderated by Dr Sayed Ahmed Bin Zarwan from the University of Minnesota, in the United States, explored the possibility of linking universities with the economic environments in which they operated and flagged up the vital role of scientific research. †

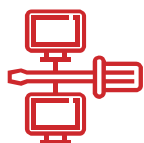
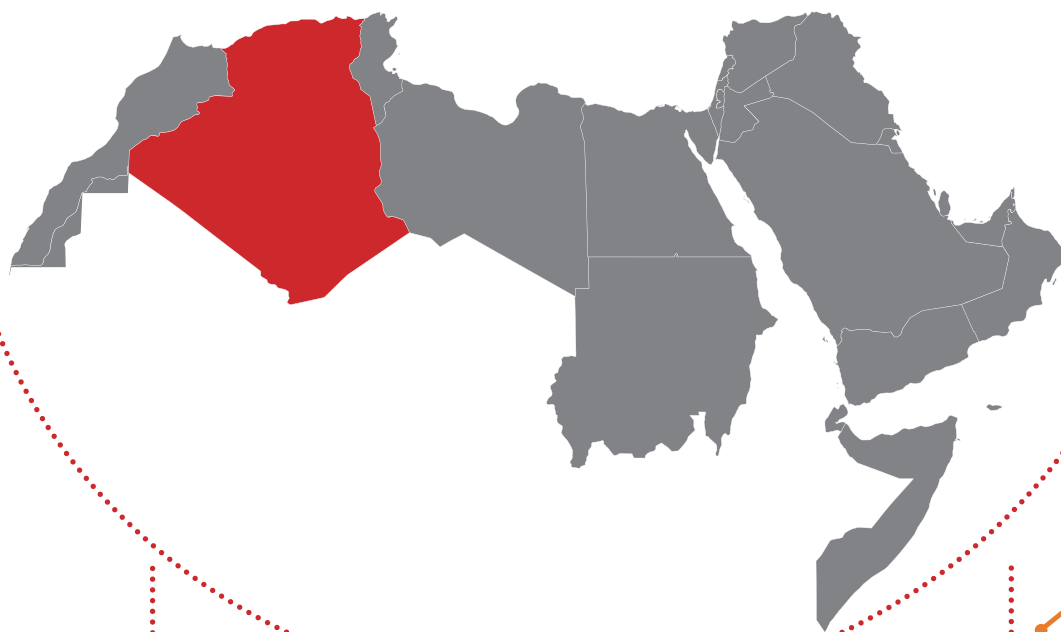
Universities should do more to prepare students for life in a post-oil economy, delegates heard as the Arab Knowledge Index arrived in Algeria.

A workshop organised by MBRF and the United Nations Development Programme (UNDP) called for degree courses to be more closely linked to labour requirements and for a greater emphasis to be placed on technical education and training.

The event was the latest in a series of events held across the Middle East and North Africa to highlight the findings of the survey, conducted jointly by MBRF and UNDP in Algiers.

It was held under the patronage of His Excellency Dr Tahir Hajjar, Algeria's Minister for Education and Scientific Research.

# ARAB KNOWLEDGE INDEX 2015: ALGERIA



**54%**

TECHNICAL  
VOCATIONAL  
EDUCATION  
AND TRAINING

**59%**

Labour supply



**65%**

Labour demand



**25%**

Entrepreneurship



**56%**

PRE-UNIVERSITY  
EDUCATION



**57%**

Enabling  
environments



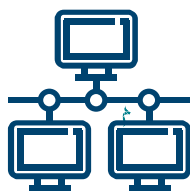
**61%**

Knowledge  
capital



**44%**

General  
developmental  
context



**25%**

INFORMATION AND  
COMMUNICATIONS  
TECHNOLOGY INDEX



**22%**

Direct indicators



**28%**

Indirect indicators



**44%**

HIGHER  
EDUCATION



**54%**

Higher  
education  
inputs



**30%**

Higher  
education  
outputs



**22%**

RESEARCH AND  
INNOVATION



**17%**

Innovation



**12%**

Research and  
development



**39%**

Political, economic,  
social environment  
and infrastructure



**31%**

ECONOMY



**29%**

Organisational  
performance  
and human  
resources



**26%**

Competitiveness  
and creative  
development of the  
economic structure

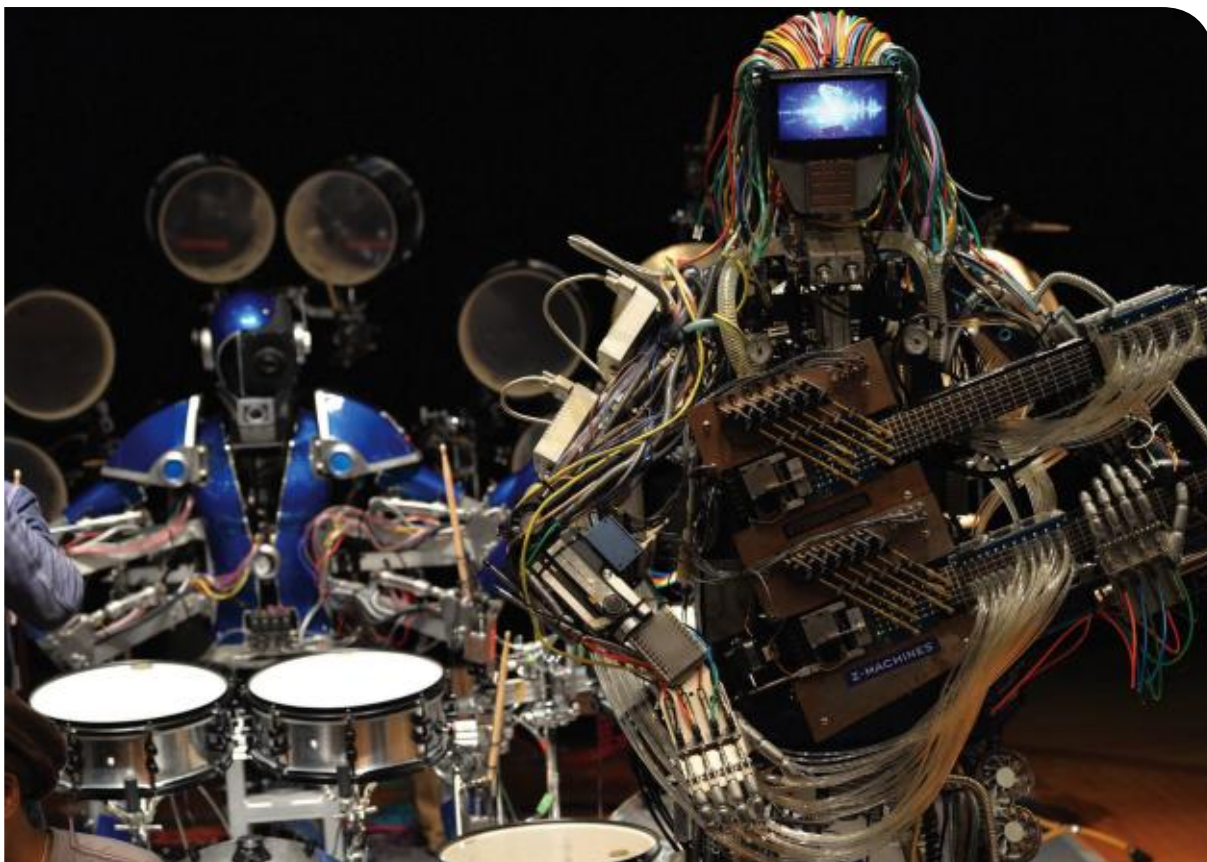


**42%**

Economy-related  
information  
technology



Photos: Getty images



# The invention convention

*Amateur crafters, engineers and computer programmers are meeting fellow hobbyists and presenting their creations to the world*

Thousands of would-be inventors met in San Mateo, California, this May for Maker Faire.

Dubbed “the greatest show (and tell) on Earth”, the family-friendly festival is part science convention, part county fair and at the same time something altogether different.

The annual event, launched 11 years ago, attracts a diverse cross-section of society – united by a desire to show off homemade items, from handicrafts to ingenious electronic devices of staggering complexity.

Visitors include tech enthusiasts, teachers, engineers, schoolchildren and artists, plus a growing number of commercial exhibitors keen to cash in on the craze.

The stereotype of the mad inventor has persisted from the time of Leonardo da Vinci to the present day. Conjuring images of geeks toiling

away in garages, sheds or bedrooms, the idea that one could come up with a winning concept and have it mass produced was once seen as eccentric, but now those once written off as nerds are striding into the limelight.

## A GLOBAL GATHERING

Maker Faire grew out of the ‘maker movement’, a fast-growing global community of would-be inventors pooling their knowledge and resources to take their prototypes to market.

The phenomenon’s rise can be attributed to various factors, including social media, open-source software and the booming trade in budget 3D printers, laser cutters and simple design software.

Online marketplaces offer an easy way to sell goods. Etsy, a hugely popular site offering all

**Above:** Robot musicians Mach and Ashura of robot rock band Z-Machines perform at Maker Faire Tokyo

**Opposite page:** Madcap inventor Doc Emmett Brown (Christopher Lloyd) in *Back to the Future*



**Above:** United States President Barack Obama is introduced to a robotic giraffe by its creator, Lindsay Lawlor, at the White House in Washington, DC

**Below:** Cristina del Valle and Natalia Febo try on 3D-printed prosthetic hands

manner of handcrafted items, is particularly known for its jewellery, homeware and bridal accessories, but the firm has recently observed an increase in the number of electronic and mechanical wares for sale

Dale Dougherty is the chief executive officer of Maker Media, which founded *Make: magazine* in 2005 and Maker Faire the following year. He says: "The maker movement encourages people to discover the maker in themselves and to seek out other makers in their communities."

"Technology is making it easier for all makers to make things and share their projects with others. They are using this technology to create new kinds of products and drive innovation."

#### WHO GOES TO MAKER FAIRES?

Among participants at the recent Bay Area event was designer Kristin Neidlinger. What began as her master's degree project to create wearable technology grew into a fast-growing firm.

Sensoree is pioneering ingenious garments to help people with sensory processing disorders such as autism and ADHD.

The clothes incorporate electronic sensors that detect physiological changes in the body such as heart and breathing rates, transmitting sound, colour and movement in response to the wearer's emotions. For instance, one piece, named AWElectric, develops inflatable 3D-printed goosebumps in response to signs of excitement.

Neidlinger says: "I love 3D printing. It is so versatile, but I want it to be more wearable, flexible and fun," she says.

"In the human body, we need joint material between the bones. If 3D prints are like bones, we need a flexible joint material to be wearable."

Rajee Shah, 15, makes paper items including earrings and pendant lamps from junk mail, old maps and catalogues.

She says: "I started paper crafting three years ago, when I was in eighth grade. It wasn't something I had much experience in; I was just looking on Pinterest for some ideas because I was feeling a little bored."

"When I found out about paper beads I started making a lot of them and found that I enjoyed





Left: A man models a Sensoree Mood Sweater at a fashion show devoted to wearable technology held in San Francisco, California

doing it.” Shah has since set up her own company, To Green and Beyond, to sell goods – and uses the funds to support causes that are close to her heart.

“A lot of people told me that the beads looked really nice and I should sell them. I figured if I was going to keep doing this, I might as well not have a lot of them stacked up at my house – I could sell them and use the money for a good cause.”

#### WHITE HOUSE WHIZZ-KIDS

Even the United States Government has caught on to the craze. In 2014, President Barack Obama hosted the first ever White House Maker Faire, inviting a select group of makers to Capitol Hill to show off their creations.

The date of the event, 18 June, was designated an international “Day of Making” aimed at celebrating makers’ accomplishments using the Twitter hashtag #NationOfMakers. The White House will also mark America’s inaugural National Week of Making, which runs from 17 to 23 June this year.

Maker Faires aren’t the only places where inventors get together. The world’s first autonomous car track day took place. Traditionally, track days invite motorsports enthusiasts to take their cars for a spin on closed courses without the constraints of traffic laws, but this was different.

Held on the last weekend of May in Sacramento, California, it featured robotic ‘drivers’ only; the event’s organiser, Joshua Schachter,

aimed to unite “lots of clever people” with the aim of lowering the cost of developing driverless cars from the millions to the tens of thousands.

Dale Dougherty adds: “Making is local and maker spaces provide access to tools and expertise in the community. We can do more to develop maker spaces in place such as schools, libraries, museums and community centres to provide access to more people, especially our youth.

“We see educators and parents inspired by the maker movement to provide hands-on learning experiences for children. We also expect that new and better ways for makers to collaborate with each other will accelerate, turning new ideas into products and bringing them to market.”

#### MAKERS IN THE MIDDLE EAST

Maker Faire has yet to arrive in the Middle East but it’s clear that the concept has caught on.

In Beirut, digital industry forum ArabNet hosted a talk on the maker movement, and Saudi Arabian start-up GeeksValley.com supplies technically minded makers with all manner of parts, from circuit boards to photovoltaic cells.

Then there’s Stars of Science. This hit television talent show from Dubai-based broadcaster MBC invites young inventors to showcase their creations for the chance to win cash, attracting the audience figures you’d expect of *X Factor*-style singing shows. The Middle East’s answer to Maker Faire is surely just around the corner. 





## Spirited UAE

*Khaled Bin Hamad, founder of creative studio Moving Reflection, hopes to make Japanese-style anime films in Dubai*

“What’s cooler than an Emirati guy wearing kandura, fighting in The Dubai Mall and breaking the shark tank?,” asks Khaled Bin Hamad. He laughs: “That’s awesome by itself.”

Bin Hamad is not, of course, advocating violence against the unsuspecting sharks at the shopping centre’s aquarium. Instead, the 35-year-old managing director of animation studio Moving Reflection Productions is discussing the trailer for his latest project – an anime series called *Empire of N*, potentially the first television programme of its kind made and set in the United Arab Emirates.

“It’s about three teenagers who disappear for three days and come back 15 years older,” he explains. “And they come back different. So the question always remains of what happened during those three days. It’s a mystery mixed with action, mixed with comedy.” He adds: “We just wanted to see a guy wearing a kandura kicking a\*\*.”

It is lunchtime in Business Bay and we’re sitting in Bin Hamad’s tiny office, surrounded by superhero figurines, fantasy novels and Japanese artwork – “the size of my apartment in Japan,” he quips. It was this love of the country’s artistry that prompted Bin Hamad to quit his job in IT eight years ago and move to Kobe, Japan, to learn about the culture and craftsmanship of anime and manga. “I saw *Spirited Away* and thought it was so beautiful to look at – it just took my breath away – but I thought at that time: ‘This is not something I can do – it’s way too good’. But then came along [Japanese television series] *Death Note* and this one was a little bit more realistic.”





And I thought ‘This is what I really want to do’. So I quit my job, I went to Japan and I stayed there for close to three years. I did my Masters in marketing and at the same time I took classes in Japanese, so then at the weekend I could take lessons in animation just so I could understand what they were saying. And when I went back to the UAE I decided I wanted to start my own animation business.

“I had a story and a comic book and I had ideas. I went to a lot of places to push it, but it didn’t go down well and a lot of doors were closing. But I didn’t give up; I thought: ‘I really want to do this so I’m going to keep pursuing it.’”

He adds: “Some of the people at certain stations said: ‘Khaled, you’re thinking 10 years in the future. You should come back after 10 years and pitch this one’. I said ‘No, this is the time, in 10 years it’s going to be irrelevant because something new will have come in. We need to create something new and something special now.’”

Rather than being deterred by the setbacks, Bin Hamad was spurred on to find a way to “legitimise” his dream and founded the animation studio Moving Reflection using the knowledge and skills he had acquired in Japan.

The company specialises in creating infographic-led corporate presentations, advertising, marketing and digital content, working for big names including Emaar and du. However, as Bin Hamad admits, “the business side” of Moving Reflections is mostly to fund



the animation projects “because we want to keep that dream alive and we see its potential with the idea”. Unveiled at this year’s Middle East Film & Comic Con, *Empire of N* will hopefully be the first fruits of this long-held dream. The trailer sparked a great response online, receiving more than 30,000 views within just a few weeks, which “for a channel with zero subscribers” was a big boost for Moving Reflection.

“It was really beautiful, and that was based on word of mouth alone,” he says. “On our page it was just 30,000, but then all the other channels started discussing it and it’s reached closer to 300,000. And people cannot wait to see the full series. If now’s not a time to change, I don’t know when it.” Although the trailer was in English,

the series will be in Arabic – dubbing into other languages is a relatively simple task. The real challenge will be making it stand out from the thousands of series made by long-established creators in Japan and the United States. Bin Hamad believes this is why creating something true to the history and culture of the UAE and the wider Middle East is key.

He explains: “A lot of Japanese anime does not rely on logic; it’s quite over the top. What we want to create here is kind of a mixture between the American and the Japanese. The action is done a lot better in Japan, but the storylines in America have a lot more detail in and logic to them. So we’re combining both to create something unique. With the artwork, it looks like anime, but there are a lot of Arabic elements to it – even the hero’s nose is an Arabic nose. Even the room at the beginning is like every guy’s room – you see the kanduras, the messy yellow beds – so we

tried to do all that.” Through these tiny details, Bin Hamad hopes to counter the negative stereotypes of the Middle East often seen in the genre in which Arab characters are reduced to either villains or caricatures in “Aladdin shoes”. However, the way to do it needs to be nuanced and not simply to “shove it in front of people”. He says: “The right way to do it is to have a cool, interesting storyline and have the culture as just the background. But, in part because of American media, people actually don’t know how we live – they think we still live in the desert and not that we are humans like everybody else. In Japan it’s the same – they see Dubai and the high buildings yet think we ride camels. They never make the connection about how that one works because that’s how they see it is. But we can change that.”

In order to transform *Empire of N* from a YouTube trailer into a fully fledged TV show, the team will require more funding and sponsorship. Previous UAE forays into this genre have fallen by the wayside due to a lack of cash. But both he and the team remain determined to make their dream come alive.

“We learned so much from the pitfalls in the past and now we are ready. When I first came from Japan I would not have been ready for the animation. Now is the right time, where we can take it and make it something that is amazing and revolutionary. But back then I was alone; now I have such a great team and we are going to evolve. We do have the potential.

“Yes, it is scary sometimes and you doubt yourself every single day when you do it, but it’s all about doing something you love and that makes you wake up every day with a big smile on your face.” †



Top of opposite page: A scene from the trailer of cartoon series *Empire of N*

Left and opposite page: Scenes from a marketing campaign made for Dolphin Energy featuring the gas company’s mascot, Khalid

# GOING OFF ON A TANGENT

*Using computers in the classroom isn't cheating – it's the way we solve real-world problems. Meet the mathematicians who say we should leave tricky equations to technology – and turn this much loathed subject on its head*

Pupils spend years grappling with geometry and puzzling over arithmetic and algebra – yet after all that effort, who honestly uses quadratic equations in daily life? One man has articulated what many of us have long suspected – most of the maths lessons we sat through at school were a waste of time.

Conrad Wolfram is the founder of Computerbasedmath.org, a project that aims to change the subject from one focused on manual calculation towards one in which abstract processes are applied to real-world scenarios. The firm is building a brand-new curriculum in the subject with computation at its heart – and he says the need for a radical rethink has never been more urgent.

“There’s a subject called maths in the real world that’s very important, a subject that drives us, drives the economy forward, is crucial for people’s individual success and their countries’ success,” he says.

“And there’s a subject that’s also called maths in schools and education that is pretty much entirely discrepant from that real-world subject.”

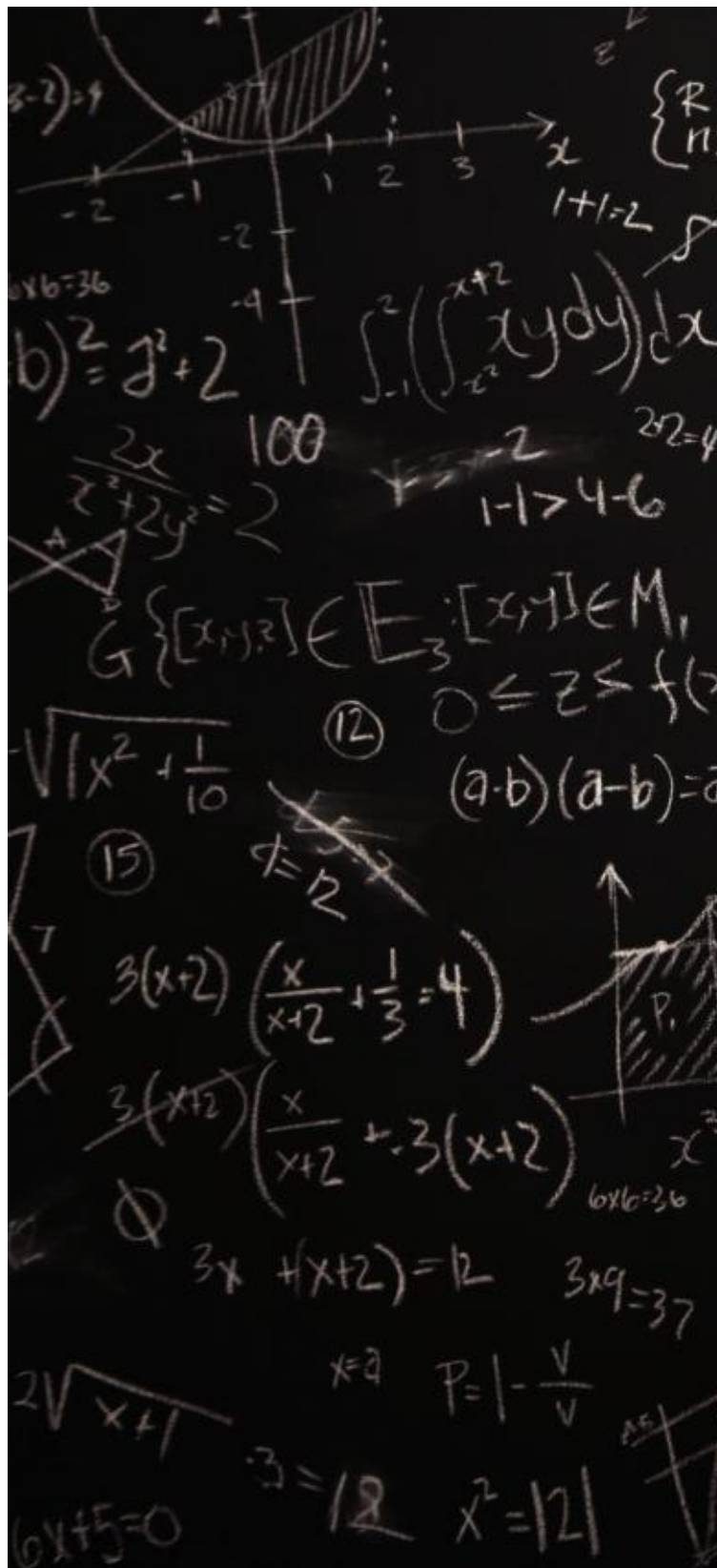
## WHERE DID IT ALL GO WRONG?

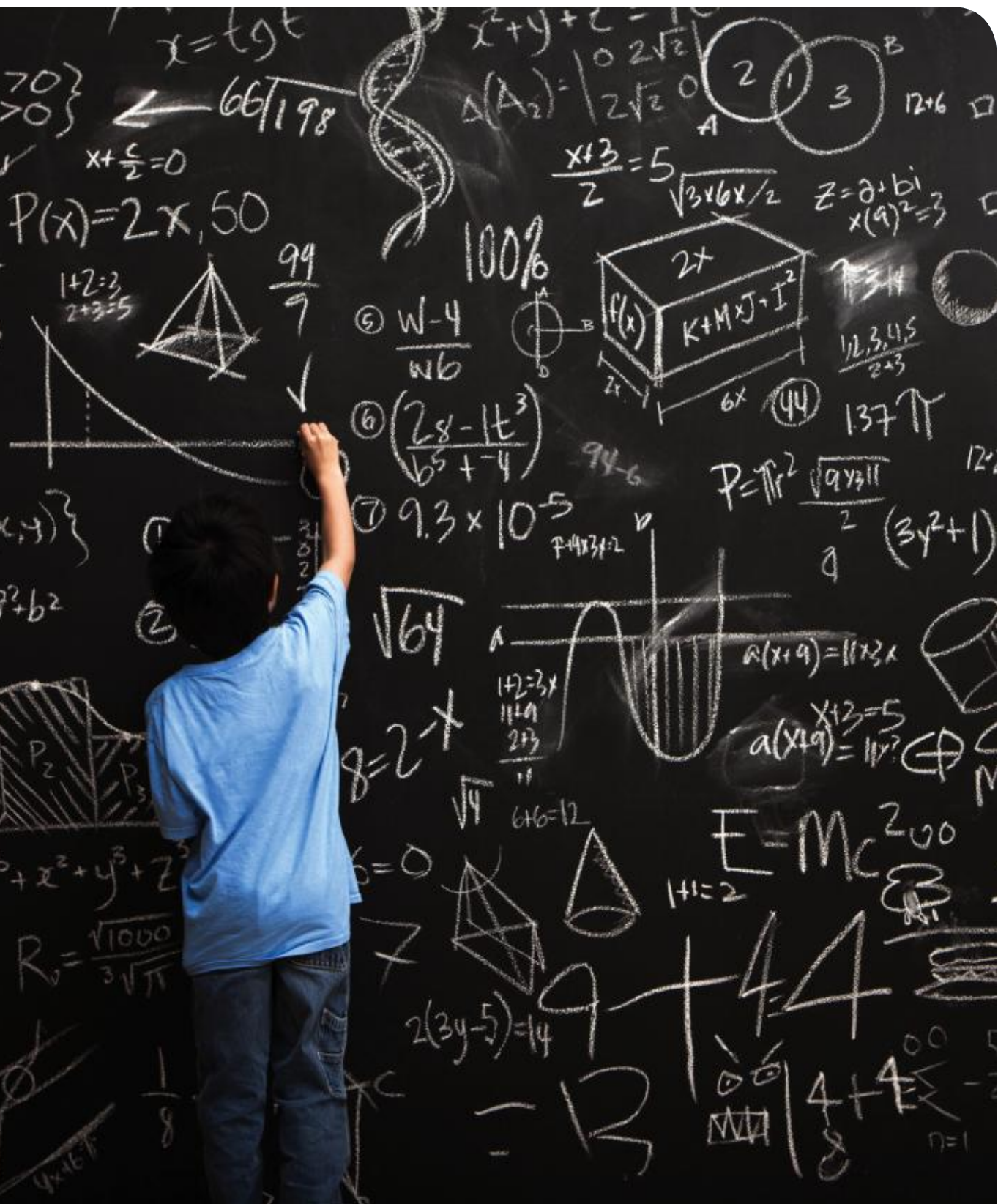
“Maths is a much broader subject than calculating. Now it’s understandable that this has all got intertwined over hundreds of years. There was only one way to do calculating and that was by hand. But in the last few decades that has totally changed. We’ve had the biggest transformation of any ancient subject that I could ever imagine with computers.”

While calculation is a necessary part of maths, it’s a means to an end, not the end itself, Wolfram says. Yet because learning to do it manually takes time, the processes involved came to dominate the subject. He says educators must separate the basics of what they’re trying to do from how it gets done; for instance, a century ago, in order to drive a car one needed to know a lot about its mechanics and how the ignition timing worked. But with automation, the act of travelling from A to B became separate from that of engineering the vehicle or understanding how to service it.

Likewise, technology has “liberated” us from poring over sums with a pencil and paper, enabling us to focus on whatever it is we’re trying to work out in the first place.

While teachers have generally been receptive to CBM in theory, bringing it into the classroom presents numerous







Clockwise from top: Pupils use a modern computer suite; a traditional maths lesson; tech-savvy nursery school pupils and Conrad Wolfram, a mathematician who says current curricula must change



hurdles. "When you approach them and say 'the subject's changed in a way that history didn't, that computers changed the subject', everybody does a double take," Wolfram says.

"At first they say 'Oh gosh, that sounds all wrong' and then they come around to it and they say 'Oh, that makes quite a lot of sense. But how on earth do we do it?', and then you get from that to the problem of assessment because then they go: 'Oh, we'd love to do it and we're interested in using technology for it but in the end my students need to pass their exams.'"

Former maths teacher Alec Titterton spent years working in education policy, devising strategies to boost attainment in "struggling" British schools. During this time, he says, the need for drastic change "became abundantly clear". As he bluntly puts it, kids are being taught the "wrong thing" altogether. Titterton, who now develops content for Computerbasedmath.org, explains that in CBM classes, complex-sounding tasks are broken down into smaller activities, enabling children to understand "the whole problem-solving cycle". "We've got a module called 'How happy are

people in my country?'" in which pupils have to find reliable data, come up with a way of quantifying happiness and write a report on it," he says, stressing that teachers are on hand to help.

"Then we flip the context to 'How digitally literate are the people in my country?' so the students have to quantify what digital literacy is, find data on it, analyse that data and make a report."

"We flip the context of the problem so that the student has a chance to reinforce what they've learned by practising it more independently than they could the first time, and in a new context."

### A MAJOR PROBLEM

Wolfram argues we should focus on figuring out what questions to ask in the first place, not trying to work out the answers with a pencil and paper.

"In traditional maths you start with a very abstract view – 'Here's an equation. You need to learn how to solve it' – and after you've learned all that, if you're very, very lucky, you might apply it to something that seems relevant to your life.

"What we're trying to do is totally the opposite way around. We start with a problem that we think you might have some interest in solving, whatever that may be, and teach maths to help you solve that problem."

Maths can be broken down into four key steps. For instance, if we ask the question: 'should I insure my mobile?', we could analyse data (the cost of doing so, for instance, and the risk of it being lost), use a calculator to solve that problem and work backwards to verify the results, and find out whether they answer the question posed.

Wolfram adds: "Now here's the crazy thing. In maths education, we're spending about perhaps 80 per cent of the time teaching people to do step three by hand. Yet that's the one step computers can do better than any human after years of practice."

Computers have been in classrooms for decades, one might say – what's so different here?

Wolfram adds: "The example I often use, which somebody showed me with great pride, was using a computer to help a student learn how to solve a quadratic equation by hand. It was completely backwards.

"Why don't we get the computer to solve a quadratic or quintic equation or whatever it is and get the pupil to apply that to harder problems, and have the teacher help with that?"

While young children must learn about numbers and basic mental arithmetic, when they move on to manually solving equations, Wolfram says, their schooling has gone awry. The problem is more acute in higher education, where regardless

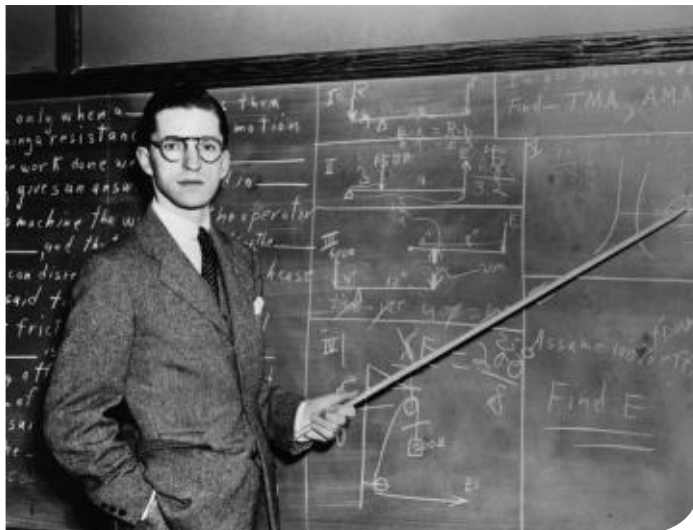
of whether they read engineering, physics or even economics, today's students often need extra coaching to help them apply their knowledge in a more practical way.

Wolfram believes CBM heralds a complete shift in global maths education over the coming decades.

"This isn't some optional extra. And the country that does this first will, in my view, leapfrog others in achieving a new economy even, an improved economy, an improved outlook.

"In fact, I even talk about us moving from the 'knowledge economy' to what we might call a 'computational knowledge economy' where high-level maths is integral to what everyone does."

He adds: "Now, I'm not even sure if we should even brand this as maths. But what I am sure of is that it's the mainstream subject of the future." †



### COMPUTER-BASED MATHS IN PRACTICE

Although in its infancy, CBM has made its way into some classrooms...

#### ESTONIA

In February 2013, Estonia became the world's first country to implement CBM, incorporating it into a project to build a new school statistics course.

Jaak Aaviksoo, who was then its Minister of Education and Research, says: "In the last century, we led the world in connecting classrooms to the internet. Now we want to lead the world in rethinking education in the technology-driven age."

Estonia has blazed a trail in technical educational reform – from age seven, children learn computer programming as a core part of the curriculum – and with leadership from the country's ancient Tartu University a number of schools volunteered for the CBM pilot scheme.

Aaviksoo, a physicist, recently left politics to become rector of Tallinn University of Technology.

He adds: "We believe in the enthusiasm and potential of the internet generation – they are ready for computer-based mathematics.

"It will also give them a competitive advantage in the labour market."

Pupils following the curriculum sit the same exams as their conventionally educated peers, and so far the results have been promising.

Alec Titterton says: "I understand the students did just as well in their traditional assessments, having done computer-based maths, which I think is pretty remarkable, all the more so when you consider they're effectively learning a different subject."

The biggest challenge was helping school staff to grasp and teach new content using unfamiliar techniques.

He says: "There's been a huge change in teachers. They've got to understand how you take a new subject and teach it rather differently, apply technology when they haven't applied it before – all in one – to try to make that work with their students."

Helping educators understand and teach CBM is therefore the main preoccupation right now.

"I think that most of the improvements we've made are in that domain, rather than fundamentally asking 'did we hit the mark with the subject matter?', to which the answer is emphatically 'yes!'"

#### SOUTH AFRICA

The team has paired up with the African Leadership University (ALU), a privately run institution launched in Johannesburg last year. Offering a "real-world university education" with the aim of grooming the next generation of business and political leaders, it offers degrees in business management, computing science, social sciences and applied psychology.

"We're working with them on what they call their 'data and decisions' course, providing some of our content on statistics and probability to enable them to analyse data and make decisions quantitatively based on various projects they do in their first year – they have a common first year before they specialise in the second."

Titterton adds: "It's actually pretty interesting, what they're trying to do there. It's an unusual case, but then what we're trying to do absolutely fits into their overall plan, which is to take universal education and make it relevant both to Africa and [the world] in general, and how people actually need to apply it."

For instance, students have worked with Coca-Cola to explore how it could distribute its products in Africa more effectively, considering the factors and variables involved.

# Bringing 3D printing to the developing world

*Pupils in rural Kenya are using technology to join forces with their peers on the other side of the globe*

When people think of pioneering science, technology, engineering and mathematics education they are likely to picture schools in the United States or Europe. But, as pupils from schools in one area of Kenya have learned, you don't have to attend a top global institution to be at the forefront of innovation.

The American-Kenyan not-for-profit organisation Kenya Connect has teamed up with US-based social enterprise Level Up Village to offer STEM and arts classes in 3D printing, coding, animation and video game design at its purpose-built learning resource centre (LRC) in rural Wamunyu. The state-of-the-art facility boasts the only computers available to students for 100km and stands in stark contrast to conditions available at Kambiti Primary School, one of Kenya Connect's 55 partner schools.

As Kenya Connect executive director Sharon Runge explains in a blog on the Level Up site, pupils at the school have no electricity at home or in class. Although, when she visited, they were familiar with traditional printing using paper, they had no concept of

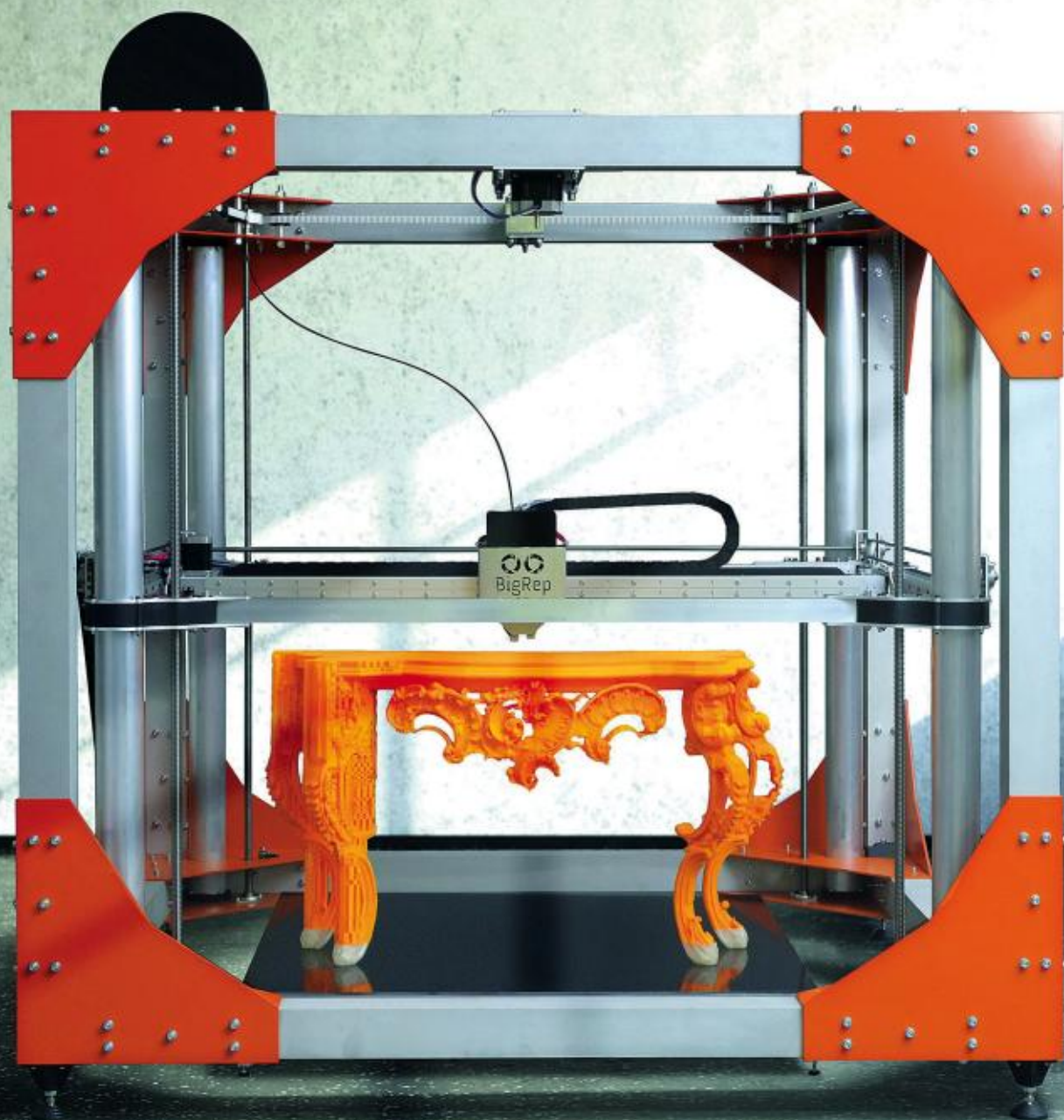
3D printing technology. Soon, however, they were learning to use computer-aided design and a 3D printer to create key chains, chess pieces and even solar lights through a course called 'Global Inventors'.

"For kids around the world, STEM might well be the pathway out of poverty. But children are very unlikely to take a path that is completely unfamiliar to them. Indeed, if there are no real role models in their communities who can demonstrate how an interest in STEM can lead to good jobs, then how can children be expected to take those career paths?" asks Level Up Village co-founder Neesha Rahim.

Under the curriculum, a Kenya Connect staff member was able to illustrate the geometry behind 3D modelling using a box to explain the axes. After this learning phase, the students became more comfortable with computer-aided design and were able to not only design an object but also print it out.

The ability to see their ideas materialise before their very eyes was considered a particular highlight of







**Top-bottom:** After watching a video message from his counterpart at New Canaan Country School, this pupil gets some pointers from Patrick Munguti of Kenya Connect, who explains in detail how the 3D printer works. The student watches with delight as his design emerges from the device

the class. According to Runge, due to a lack of resources, students in rural Kenya rarely have the opportunity to apply what they have learned in class. But the programme allowed them to participate in hands-on project-based learning using today's cutting-edge technology.

As Rahim explains, these advances are democratising the process of innovation and invention and becoming increasingly important for the future workforce.

"Prototyping used to be something only members of the elite, who could afford big factory production costs, could do. That is no longer the case with the advent of low-cost 3D printers. But it's not really the actual printers that are changing the future of education; it's the 3D design software," she says.

"All of a sudden, 3D design is being used in industries from home decor to space travel and architecture to medicine plus robotics to virtual reality and much more.

"It is an important skill the children of today need to know – how to leverage 3D design and how to collaborate, and innovate, with other people. Those sitting right beside them as well as those who are across the globe."

The results of the course have been impressive, Runge says. Students who took part are now more engaged in their education and have a better understanding of maths, especially in terms of calculating volume and area, according to observations from their teachers. But the curriculum is about more than just fostering creativity, building analytical skills and problem-solving.

It has been designed in partnership with schools in the West to provide opportunities for collaboration and to allow institutions the opportunity to give back.

A portion of the tuition fee paid is used to fund the same course and supplies to the global partner organisation, such as Kenya Connect, on the other end of the collaboration.

More than 100 schools in the US, several in Australia and one in the United Kingdom have signed up to the initiative so far and Level Up plans to approach UAE institutions this month.

"We came to the table with a very deeply held conviction that our children needed to connect with students from around the world, not only because it builds perspective but also because we saw that opportunities that blend global connections with project-based learning lead to greater engagement, greater curiosity and a sense of empowerment," recalls Rahim when asked to explain the inspiration behind the initiative.

## KENYA CONNECT AND LEVEL UP

Sean Canavan, global programmes manager for Level Up Village, explains how the two organisations came together

“We were introduced to Kenya Connect by a college student who worked for us and was familiar with the organisation’s work. From there, the relationship took off. Kenya Connect’s model of bringing 21st century technology and skills to rural Kenya is exactly in line with what we do at Level Up Village.

“We offered our first at Kenya Connect in September of 2015 and since then we have run more than a dozen classes with the organisation. Earlier this year, we helped them acquire a 3D printer for their learning resource centre so they could offer our

‘Global Inventors’ 3D printing course together with partner students in the United States.

“We have had great success with partners in Africa because there is a dire need for educational innovation. What our programmes do is make it easy for schools and organisations to move towards a student-centred STEM experience with a strong global exchange component.

“Level Up Village currently has 10 African partners in seven countries, some of which operate in multiple schools. We have several more about

to start with us in the next few months. These include forward-thinking schools such as Gayaza High School in Uganda, which consistently wins national prizes in science and technology competitions.

“Other partners have taken Level Up Village courses to multiple schools. Exponential Education in Ghana is working with several different schools over a large geographic area with courses ranging from ‘Global Doctors’ [biology] and ‘Global Storybook Engineers’ [literacy/design] to ‘Global Inventors’ [3D printing] with students from ages 10 to 16.”

“We saw early on that a symbiotic relationship between donor and recipient could be built via a ‘take a class, give a class’ model that other social impact companies had already proven sustainable.”

Pupils from Kambiti worked with their contemporaries at New Canaan Country School in Connecticut using video messaging for communication. According to Runge, each class exchanged video messages and pupils asked each other questions and shared details about their family backgrounds and hobbies. Students in each country could also design their own projects, then have them edited by their partners on the other side of the world.

“Through this process, the Kenyan students have learned that even though they live in a different part of the world without many resources, they still share much in common with children in other countries. This has helped to seal the geographical gap between students and helped them to bond.

“It has also sent a powerful message that they are just one and the same people coming together to solve problems,” Runge says.

This end result shows just how far Kenya Connect has come since it was founded in 2002 as a non-profit organisation based in Maryland, US, and Wamunyu, Kenya. Where once it fulfilled its mandate to connect children in Kenya with those across the world via pen pal schemes using snail mail, now students can interact with each other globally via 3D design software and video messaging at the organisation’s learning resource centre.



The facility, which was completed in 2012, offered eight-week basic computer classes to more than 500 students and 130 teachers in the local area last year. However, while it may be able to offer STEM classes still unavailable even in many Western classrooms, the organisation’s next challenge is enabling more schools to access its facilities.

Kenya Connect is currently raising funds for a bus to help transport pupils at more distant schools to the LRC, with an eye to giving more students access to opportunities like those offered to Kambiti Primary School. †

Above: The computer suite at Kenya Connect’s learning resource centre

## Giving STEM a sporting chance

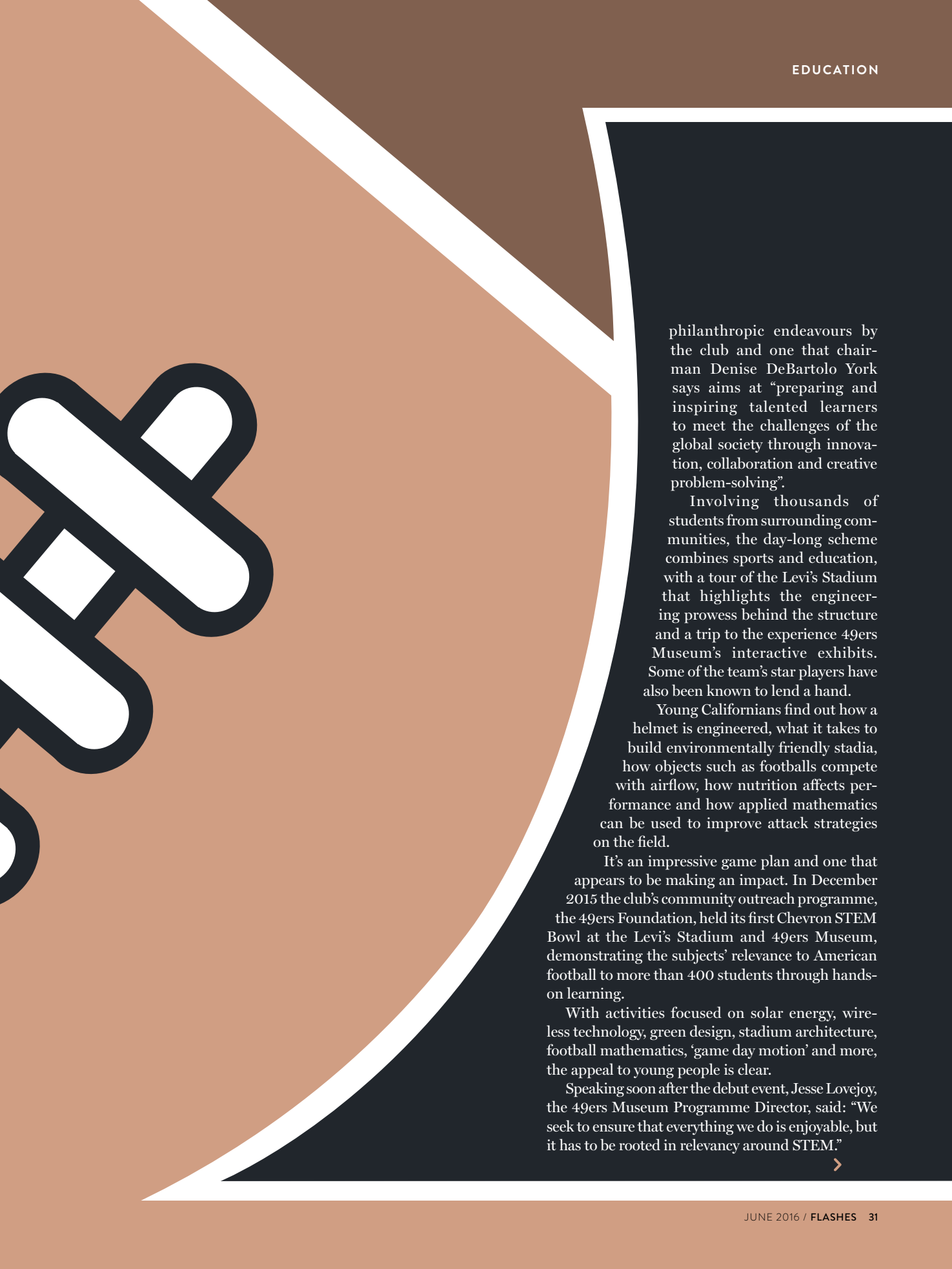
*American football team the San Francisco 49ers have teamed up with energy giant Chevron to offer children an engaging insight into science, technology, engineering and maths. Flashes looks at the club's STEM Education Programme and finds there's more at play than meets the eye*

It seems somewhat natural that American footballers the San Francisco 49ers launched an education initiative focused on science, technology, engineering and mathematics.

The California team's base at the Levi's Stadium is a mere 10 kilometres from Silicon Valley – a place that, according to legend, played a central role in 49ers top brass deciding to promote the subjects among young people.

Its director of community relations and the 49ers Foundation, Joanne Pasternack, recalls that when surveying the venue site prior to its construction, club executives climbed one of the area's tallest buildings and looked out over the iconic nerve centre for innovation. There and then, they vowed to help create tech leaders of the future.

Six years on, they have done just that. In 2014, the 49ers launched the STEM Education Programme – the latest in a long line of education-based



philanthropic endeavours by the club and one that chairman Denise DeBartolo York says aims at “preparing and inspiring talented learners to meet the challenges of the global society through innovation, collaboration and creative problem-solving”.

Involving thousands of students from surrounding communities, the day-long scheme combines sports and education, with a tour of the Levi's Stadium that highlights the engineering prowess behind the structure and a trip to the experience 49ers Museum's interactive exhibits. Some of the team's star players have also been known to lend a hand.

Young Californians find out how a helmet is engineered, what it takes to build environmentally friendly stadia, how objects such as footballs compete with airflow, how nutrition affects performance and how applied mathematics can be used to improve attack strategies on the field.

It's an impressive game plan and one that appears to be making an impact. In December 2015 the club's community outreach programme, the 49ers Foundation, held its first Chevron STEM Bowl at the Levi's Stadium and 49ers Museum, demonstrating the subjects' relevance to American football to more than 400 students through hands-on learning.

With activities focused on solar energy, wireless technology, green design, stadium architecture, football mathematics, 'game day motion' and more, the appeal to young people is clear.

Speaking soon after the debut event, Jesse Lovejoy, the 49ers Museum Programme Director, said: “We seek to ensure that everything we do is enjoyable, but it has to be rooted in relevancy around STEM.”





stand to benefit. Using sport as its hook, the multinational's STEM Zone initiative aims to pique young people's interest in such subjects and encourage them to consider STEM-related careers – possibly, one would assume, with Chevron.

Given the global dearth of suitably qualified candidates in petrochemicals and the competitive nature of the industry, mining and developing the most gifted individuals makes sense. Indeed, a 2013 Harvard Business Review article identified “getting the attention of the next generation” as a key component in solving the energy industry's acute shortage of talent.

A report published that year by the Georgetown Centre on Education and the Workforce projected that 2.6 million STEM jobs will need to be filled by 2020, a task no doubt compromised to some degree in recent years by US employees' migration to the Gulf Cooperation Council, where energy companies in Saudi Arabia and the United Arab Emirates, for example, have been willing to pay above the odds for top expatriate talent.

Keeping young Americans interested in STEM and emotionally and educationally tied to their locale would certainly have a corporate benefit.

#### MUTUAL GAIN

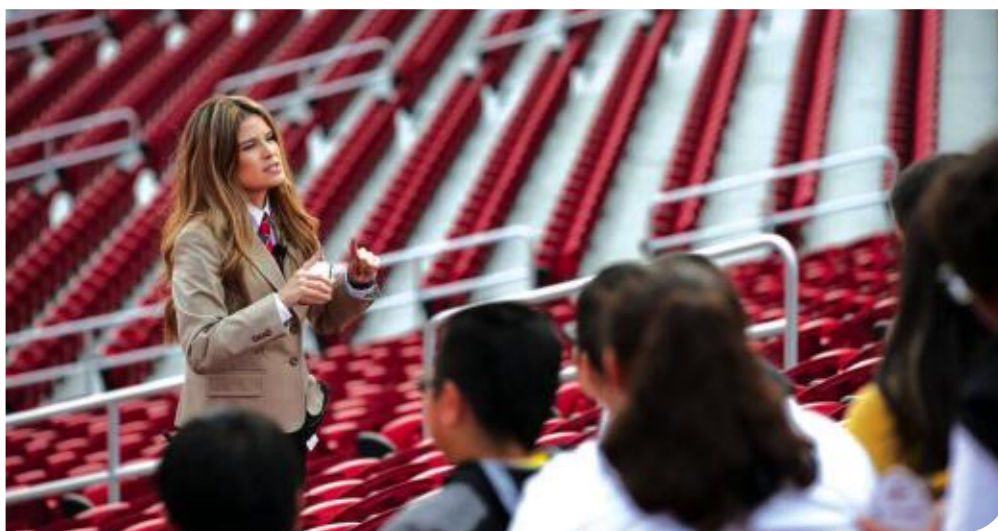
The emotional tie is one that serves the business side of the 49ers very well. Retaining a strong fan base is key for ticket sales, not to mention shirts, game-day refreshments and more. Add to that the fact that the club strives to hire the best possible candidates, from players and coaches to accountants – all of whom benefit from STEM.

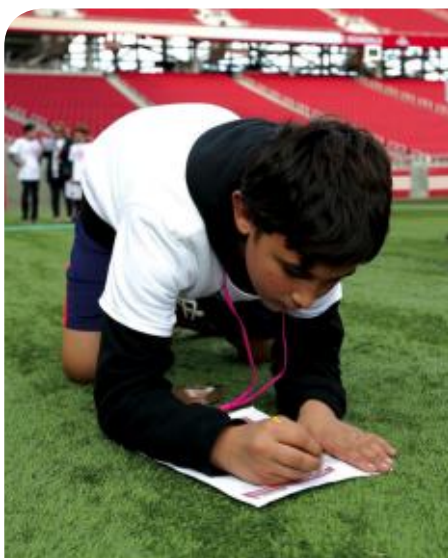
But if you are under the impression this type of initiative is only beneficial on a micro level,

#### STAFFING CRISIS

It's certainly a smart way to help youngsters see the fun side of seemingly serious subjects, and on no small scale. The education programme aims to engage more than 60,000 7th to 12th grade students (ages 12 to 17) per year and, what's more, the 49ers STEM Leadership Institute, in collaboration with the Santa Clara Unified School District, annually puts about 60 high achievers on a six-year programme aimed at developing such skills. But while this impressive work should not be undermined, cynics don't have to look too hard to find cause for eyes to roll. Scratch beneath the surface and you can find evidence for rather less altruistic motives.

As well as helping the team to secure a loyal fan base for the future, garnering a community-minded reputation in the process, corporate partners such as Californian energy giant Chevron





think again. The drive to boost American students into scientific and technical careers is a matter of national importance.

In 2013 – one year before the 49ers programme was launched – it was reported that experts at the Partnership for a New American Economy project said there would be a shortfall of 230,000 qualified advanced-degree STEM workers by 2018.

In the same year, the state of the States' STEM capabilities was thrust into the spotlight by the Organisation for Economic Cooperation and Development, which released the results of a global survey showing that America ranked 21st out of 23 countries in its mathematical ability and 17th out of 19 countries in problem solving.

The issue appears to have been brewing for several years. Following the tech innovation boom in the 1970s, which was born out of the golden years of manufacturing and creativity from the 1950s onwards – itself based on a rich decades-old tradition of research, development and invention – America's competitive edge in STEM-based sectors has been in decline.

In 2012, the senior vice president of IBM's systems and technology group, Rodney C Adkins, penned an impassioned plea for educators to help shape a generation that would “create the next great technology innovations, not just consume them”.

He wrote: “The is such urgency for the US to develop a stronger workforce of experts in science, technology, engineering and math.



After all, according to the US Department of Labour, only 5 per cent of US workers are employed in fields related to science and engineering, yet they are responsible for more than 50 per cent of our sustained economic expansion.

“We need to increase the size of the STEM education pipeline by maintaining an enthusiasm for science, technology, engineering and math throughout high school and college.”

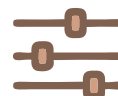
It's a factor not lost on the 49ers. Nor is the need to equip young people for careers in an intensely competitive job market.

Jesse Lovejoy acknowledged as much after last year's STEM Bowl, saying: “We've read the research, we know the direction the job market is going, we know the importance of these skill sets for kids to be able to get into college, let alone succeed in college. The idea is for them to go home today and view STEM in a different and approachable light.”

There is no doubting the perks this type of initiative brings to companies such as Chevron and the San Francisco 49ers, but that should not overshadow the economic, societal and academic benefits they bring.

The educational support and development being afforded young people – delivered in an engaging and inspiring way – is vital not just for the career prospects of many of the initiative's participants but also for America's yearning to re-establish itself as a world leader in STEM. ↑

## FIELD TRIPS



## CUSTOMISABLE CURRICULUM OPTIONS



## LEVI'S STADIUM TOUR



## GUIDED MUSEUM EXPLORATION



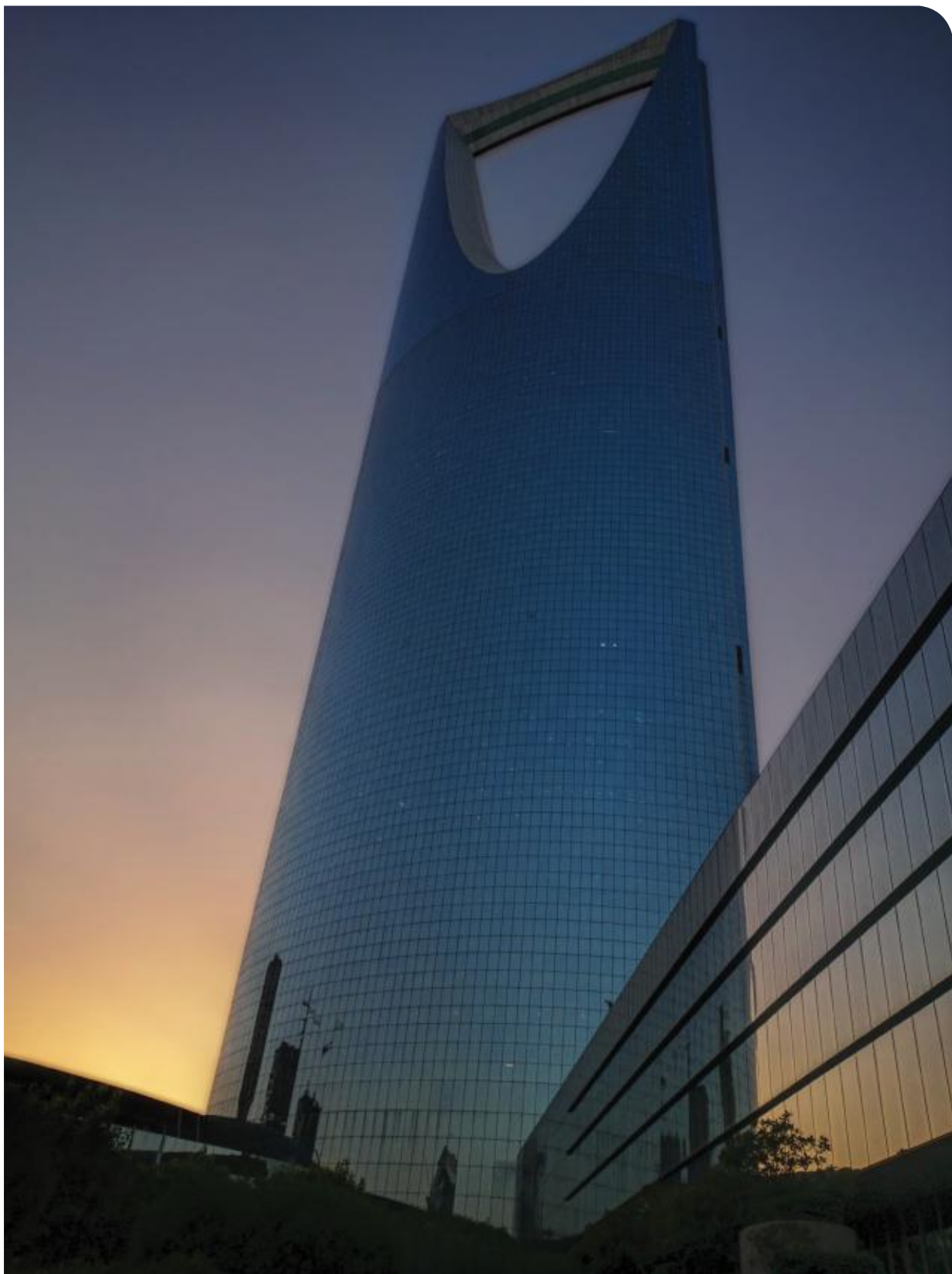
## AGES FIVE AND 12-13



## AGES NINE TO 11



## AGES THREE TO 13



## A NEW MESSAGE

*The announcement of Saudi Arabia's Vision 2030 outlined sweeping reform for the country's economy. But what was also different was the way the government made an effort to engage the kingdom's youthful population through social media...*

"For the older generation it was easier," said Abdulrahman Alkhelaifi, 20. "They'd get out of university and get a government job. Now you need an advanced degree."

"My parents had great opportunities," agreed Aisha al-Shugairi, an 18-year-old who is currently looking for work.

"I thought it would be the same for us."

According to a study by consulting firm BCG, a quarter of young Saudis cited career opportunities among their top three concerns, after the cost of living and affordable housing. And with 19 per cent of Saudi Arabia's population between the ages of 15 and 24 and another 27 per cent 14 or younger, it is clear that the economy and job creation is an important issue, especially in this age of low oil prices. Saudi Arabia relies on oil exports for over 90 per cent of its government revenue, making the Saudi budget, and hence the state itself, exceptionally dependent on this one source of income. That is why the announcement of Vision 2030, a sweeping economic reform plan, was of major importance. His Highness Prince Mohammed Bin Salman Abdulaziz Al Saud, Deputy Crown Prince and Minister of Defence, said in an interview on Al Arabiya: "We have all developed an oil addiction in Saudi Arabia and this is dangerous and has hampered development in many sectors during past years."

### DIVERSIFICATION

The main aim of Vision 2030 is to generate a significant amount of revenue from means other than petroleum. This includes subsidy cuts, tax rises, sales of state assets, a government efficiency drive and efforts to spur private-sector investment. The Deputy Crown Prince has previously said that the reforms will help Saudi Arabia to generate Dhs 367 billion in non-oil revenue by 2030, and create six million jobs in non-oil sectors by 2030 by focusing on manufacturing, mining, tourism and healthcare.

The 30-year-old Deputy Crown Prince is admired by young Saudis for his tech-savvy,

can-do approach, work ethic and his efforts to reach out to them. And in order to reach young people, you need to use social media channels. According to George Bassoum, chief executive of advertising agency Y&R GCC: "Saudi Arabia is one of the most digitally engaged societies in the world."

Years of heavy investment in the telecommunications industry have resulted in a highly digitally active population with broadband penetration reaching 66 per cent and smartphone usage as high as 76 per cent, according to media agency UM. Their figures also point to a very socially active population, with around 8.5 million Facebook users, 10 million on Instagram and around 12 million on Twitter. Roughly 9 per cent of its internet population is on Snapchat and, according to figures from Google, Saudi Arabia has the highest YouTube watch time per capita in the entire world. Moreover, Saudi youth get most of their news from social media and online according to this year's ASDA'A





Burson-Marsteller Arab Youth Survey. The fact has not been lost on Saudi government officials. Before the unveiling of Vision 2030, Twitter was used alongside traditional media to build anticipation and introduce key discussion phrases in the form of hashtags. “A strong and determined country with a connection between the government and the citizen,” one of the slogans read.

This approach has been incredibly successful. Since His Highness Deputy Crown Prince Mohammed Bin Salman announced the sweeping economic reforms on 25 April aimed at reducing the country’s dependence on oil and plans for a Dhs 7.3 trillion sovereign wealth fund, there have been more than 13 million tweets on the Arabic version of the Saudi government’s Vision 2030 Twitter handle @saudivision2030, with users praising efforts to transform the economy. The response on Twitter involved 83 per cent males and 17 per cent females, with 52 per cent of the responses being made through the hashtag “Thank you, Mohammed Bin Salman”. Many also tweeted about the contents of the interview that Deputy Crown Prince Mohammed gave Al-Arabiya, with many talking about the manner in which he was going about boosting the country, investing in its youth, increasing investment opportunities and reducing unemployment.

### OPTIMISM

French social media monitor SemioCast described this level of outreach in a state-sponsored debate as exceptional, with the discussion reaching 46 per cent of the 7.4 million active Twitter users

in the Kingdom. Many of Saudi Arabia’s most influential social media users threw their weight behind Vision 2030. Women’s health campaigner Samia al-Amoudi, who has 97,000 followers, tweeted “Vision 2030 is the beginning of a new era.” Omar Hussein, a young comedian popular on YouTube and with 1.5 million followers on Twitter, released a video on YouTube that promised to explain Vision 2030 in three minutes. It has been viewed more than a quarter of a million times. “The people are happy with the positive steps towards reform and change that address their concerns and worries of the future. The inclusion of a wide variety of young people in the programme is worthy of praise and a sign it will succeed,” said Islamic preacher Salman al-Ouda.

There were also congratulatory tweets from further afield, among them UAE leaders. “An ambitious and historic programme from the King of Decisiveness,” His Highness Sheikh Mohamed Bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, tweeted, using a popular nickname for His Highness King Salman Bin Abdulaziz.

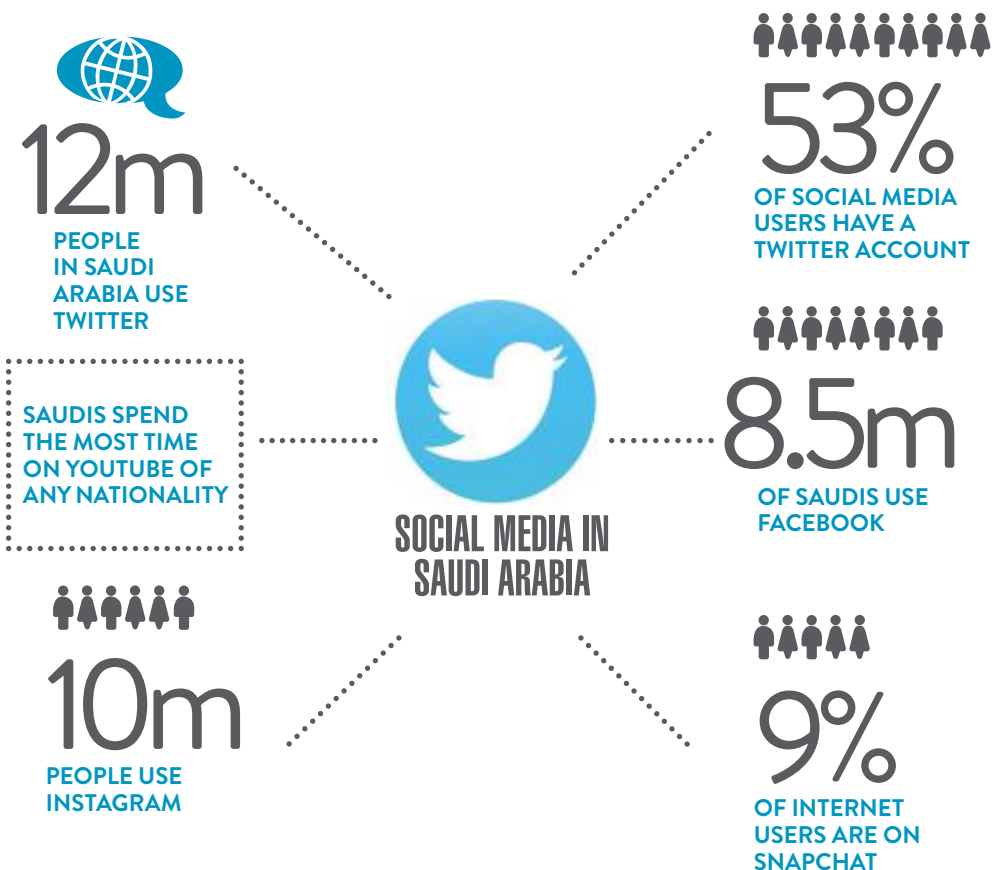
“We are overjoyed with Vision 2030. This is a joy based on a new future, and optimism, for our region,” His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, tweeted to his 5.85 million followers.

When it comes to economic plans and diversifying from oil, these two leaders are well versed on the subject. The UAE, despite being the world’s

sixth-largest oil exporter with Dhs 511 billion of hydrocarbon revenues in 2013, relies on the sector for less than 30 per cent of its fiscal earnings. According to UAE Plan 2021, the contribution of the non-oil sector is expected to reach 80 per cent in 2021 through intensive investment in the industrial and tourism sectors, air and maritime transportation, import and re-export, as well as through supporting activities based on the knowledge economy. Dubai has been particularly successful in this regard according to a report issued by the Dubai Economic Council. In 1981, the oil and gas sector used to account for 55 per cent of GDP, but since then it has taken a steep downward trend to reach less than two per cent in 2014. The UAE is evidence that economic reform and diversification can succeed. Saudi Arabia's Vision 2030 is a bold undertaking but by engaging the Kingdom's youth through social media, it has tremendous support. This was made clear by leading journalist Mohammed Alehaidib, who tweeted to his 164,000 followers: "Deputy Crown Prince Mohammed Bin Salman has a profound and transparent vision; he cares about Saudi citizens." ﷲ



Photos: Getty images



Publishing a book is an achievement at any age. Doing so at primary school is enough to make any child glow with pride, especially if it's then read by strangers who live thousands of miles away.

That's just what happened in Abu Dhabi when youngsters aged eight to 12 wrote and illustrated short stories which were then published on iTunes – and downloaded more than 3,000 times.

Kiwa Slam is a two-day workshop that helps kids tap into creativity using language, art and technology. For those unfamiliar with the term, a 'slam' is typically a literary contest in which writers recite their entries and are judged by members of the audience. Although the Kiwa initiative is more collaborative in nature, the children, aged eight to 12, were split into small groups and encouraged to work as teams.

Pupils from Abdulla Bin Otaiba Primary School, Asayel Primary School and Hamdan Bin Zayed School took part in a series of two-day workshops, producing a total of 24 titles.

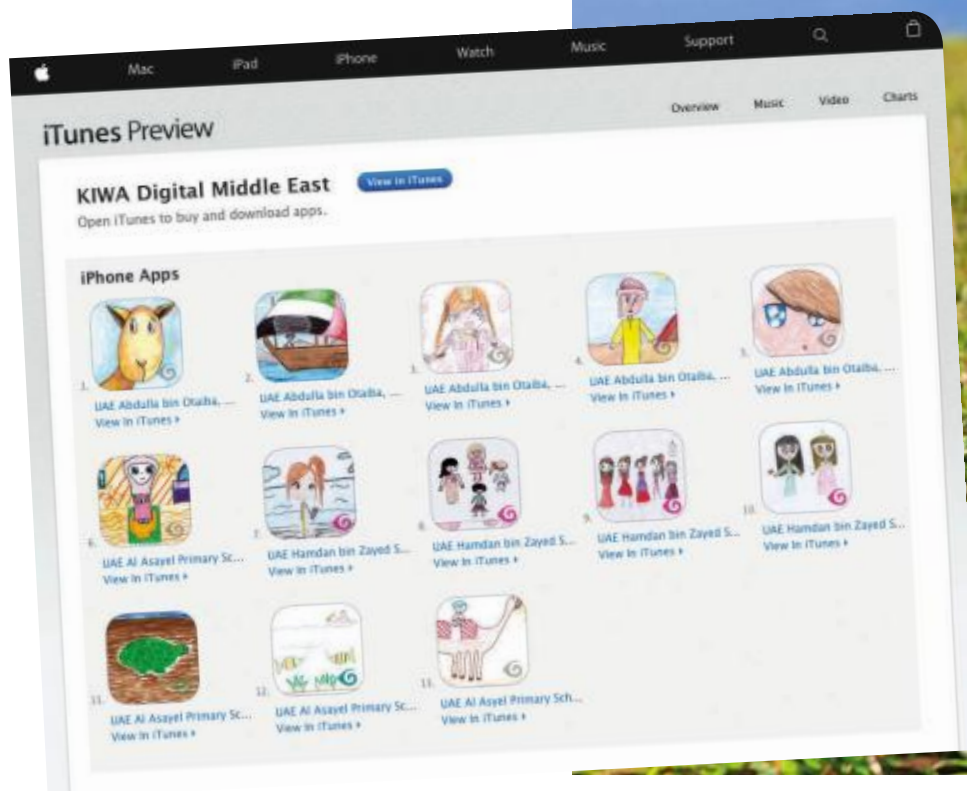
### CULTURAL PRESERVATION

The project is run by Kiwa Middle East, a publisher of "experiential digital books" that is increasingly involved in education. Its chief executive, Rhonda Kite, has been involved in similar workshops among indigenous communities in



## WEB WUNDERKINDS

*Pupils are publishing their own e-books via a project to preserve ancient traditions through digital technology*





Photos: Getty images



**Top:** Maori children in New Zealand use a tablet computer

**Top right:** A scene from the animated e-book *Where is Asma?*, a story about a game of hide-and-seek that goes wrong – written by pupils at Hamdan Bin Zayed School, Abu Dhabi



New Zealand, Australia and Alaska. Whether transmitting the legends of Inuit elders to a digital generation or revitalising European folklore, Kite, who is of Maori heritage, believes many disparate peoples share a rich tradition of storytelling.

Passionate about preserving cultural traditions as well as her native language, she used her 20 years of expertise in television production to develop unique processes that bring traditional tales to life in compelling digital formats.

The eight books produced at Hamdan Bin Zayed School were all the more impressive for being trilingual. Each was narrated in Arabic, English and Mandarin Chinese, a compulsory subject at the all-girls government primary school.

Working in groups of four the pupils, aged 11 and 12, brainstormed ideas, sketched out plots and were helped to convert their narratives into script form. This entailed cutting the text down to meet stringent word counts.

They also drew pictures to accompany their words, but with a maximum of five images allowed per book they had to be selective and consider which ones would have the greatest impact.

The pupils were recorded as they read their work aloud in all three languages and also searched the internet for sound effects to add a special finishing touch.

“They looked for camel noises,” says Kite.

“I didn’t realise camels made so many kinds of noises, but they could tell the difference – and they just had to have the right ones.”

### BRIDGING CONTINENTS

When children realise their work is being seen in far-flung countries, this sends an important message that their way of life is of value. Kite says she’s inspired by the democratising effect that developments in digital publishing can provide. “The first thing we noticed is that the books are being

downloaded more from overseas than they are here and for children this is always a really beautiful surprise,” she says.

“When we first went live with the Hamdan Bin Zayed books, about half of the downloads were from the United States and I think 5 per cent were from Australia.

“This tells us that there are people out there who are looking for Arabic-language content and coming across these children’s books.”

In Australia, the company works with the Victorian Aboriginal Corporation of Languages, members of which value digital technology as a key part of their language revival strategy.

### A PIONEERING PROJECT

Kiwa has also collaborated with a number of Maori iwi organisations in New Zealand on projects as diverse as the retelling of ancient legends and stories narrated by children in collaboration with their elders.

“The Kiwa Slam is our way of empowering students to become their own cultural representatives – the storytellers of their generation – as well as an innovative way to introduce kids to digital publishing,” Kite says.

“The students engage quickly and become immersed in the process. In our experience, this simple exercise is enough to take quiet, shy children and turn them into some of the biggest and most vocal champions of their heritage.

“And for parents, teachers and our team, the magic of watching a child’s joy at seeing their work made permanent in an experiential mobile application is unbeatable.”

The way Kiwa Slam came about is quite a story in itself. Kite was in the United States for a conference run by the Association of Alaska School Boards (AASB) when she got talking to members of the organisation’s Consortium for



Digital Learning (CDL). Its programme coordinator, Steve Nelson, says: "For a long time in Alaska there's been a move to preserve and revitalise the indigenous native Alaskan languages and a lot of folks are solidly behind those efforts, either in general or as part of the educational system at their school.

"We invited Rhonda to come and speak at the AASB conference and she did, but she also came with an idea: 'Why don't we produce a book in 48 hours with students and some advisors and we'll turn it around, we'll incorporate some languages in there and it will be a way for generations to work together to produce a product?'"

He adds: "We travelled to Chevak that same month."

That November, 15 high school pupils gathered in Anchorage for the inaugural Kiwa Slam. They were split into four teams, each representing a different school district, and tasked with creating a 20-page illustrated book in just 48 hours using the theme "We are Alaska" as inspiration.

With assistance from seven adult supervisors, each group created a storyline linked to a myth or legend from their community.

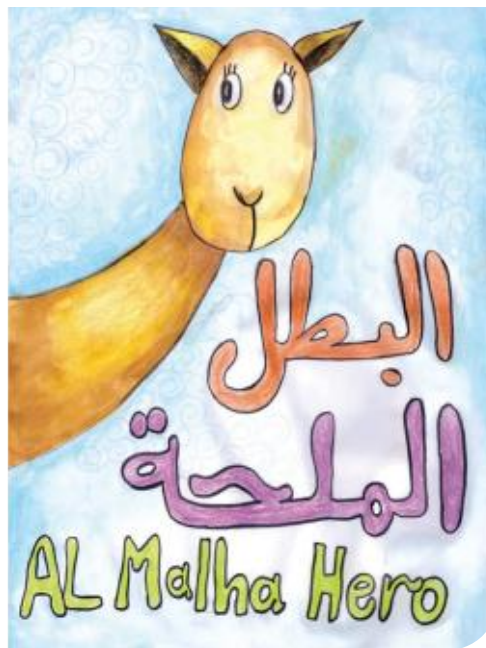
Each team was allotted five pages to illustrate and told to write no more than 100 words. They also had to record audio of themselves narrating the story.

Chevak High School pupil Mary Pingayak took part in the slam.

She says: "We did 'We are Alaska' on traditional values and how we are as a people and what we do.

"My little brothers and sisters like to read that story every single day and they press on the words and they copy what they're saying."

Her classmate Kyla Fermoye says: "I think



**Left:** An interactive e-book about a falcon produced by pupils at Abdulla Bin Otaiba Primary School and Al Malha Hero by pupils of Hamdan Bin Zayed School

that's kinda cool, especially since it's for the kids," while fellow participant Matt Atcherian adds: "It feels pretty good passing our stories from our elders and from our ancestors so that we can be able to pass it on from generation to generation."

The three teenagers live in the village of Chevak, in Kashunamiut School District, and speak the area's Cup'ik language. The finished files were sent to New Zealand and the resultant book, *We are Alaska: Student Voices from Our Communities*, was assembled overnight and published on the iTunes App Store.

Dr Robert Whicker, the director of CDL, says the event was the first Cup'ik-language book slam in the world.

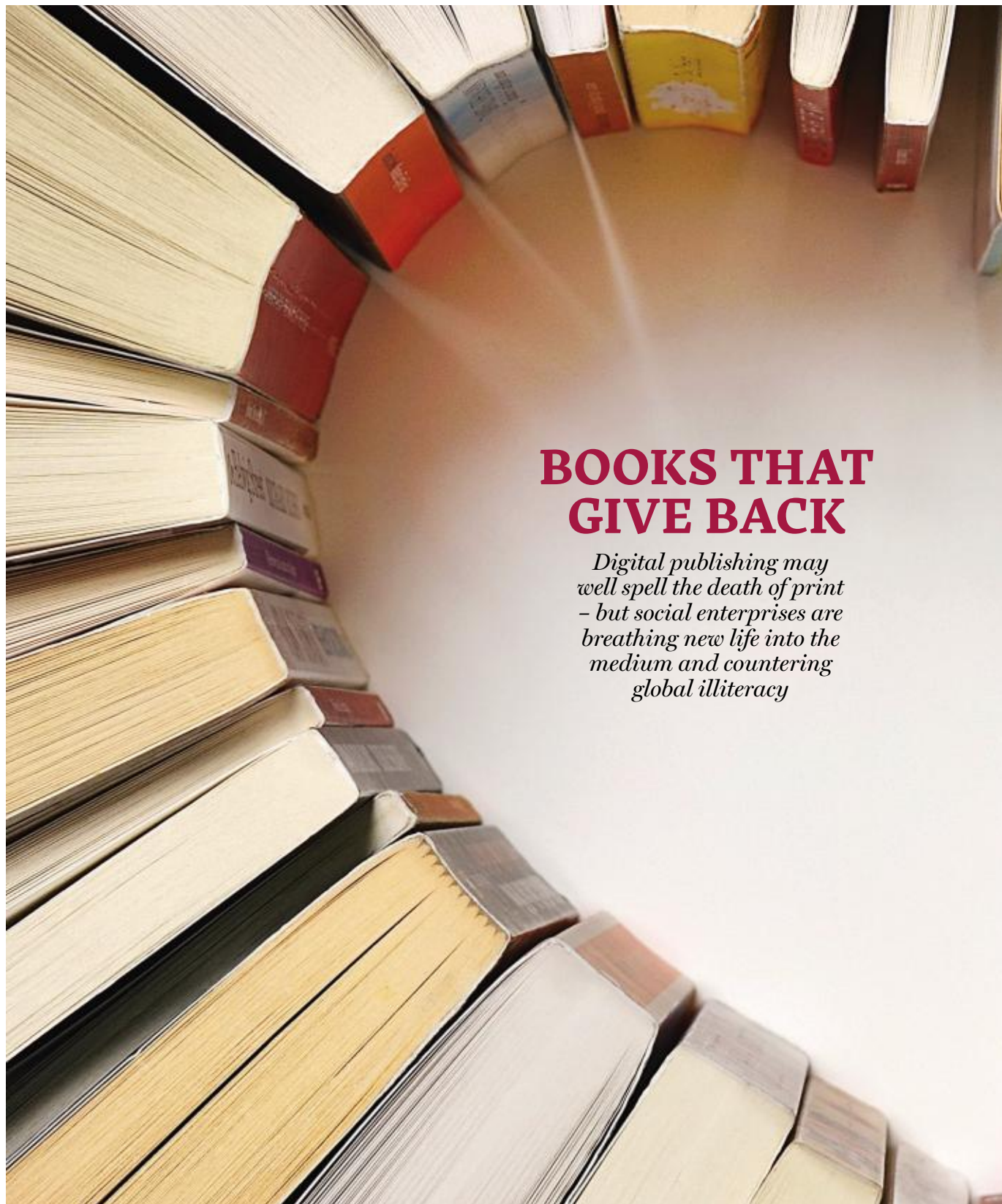
"After the first two book slams we were able to travel back to Chevak together and it was really cool to see their excitement and hear them speak Cup'ik words as we demonstrated the book," he says.

"The kids who participated in the Slam game gained instant credibility and were viewed as rock stars."

James 'Apala' Ayaluk, the chief of the Cup'ik tribe, is also full of praise for the project. He says: "Traditionally, everything was done by word-of-mouth and by listening, and observing.

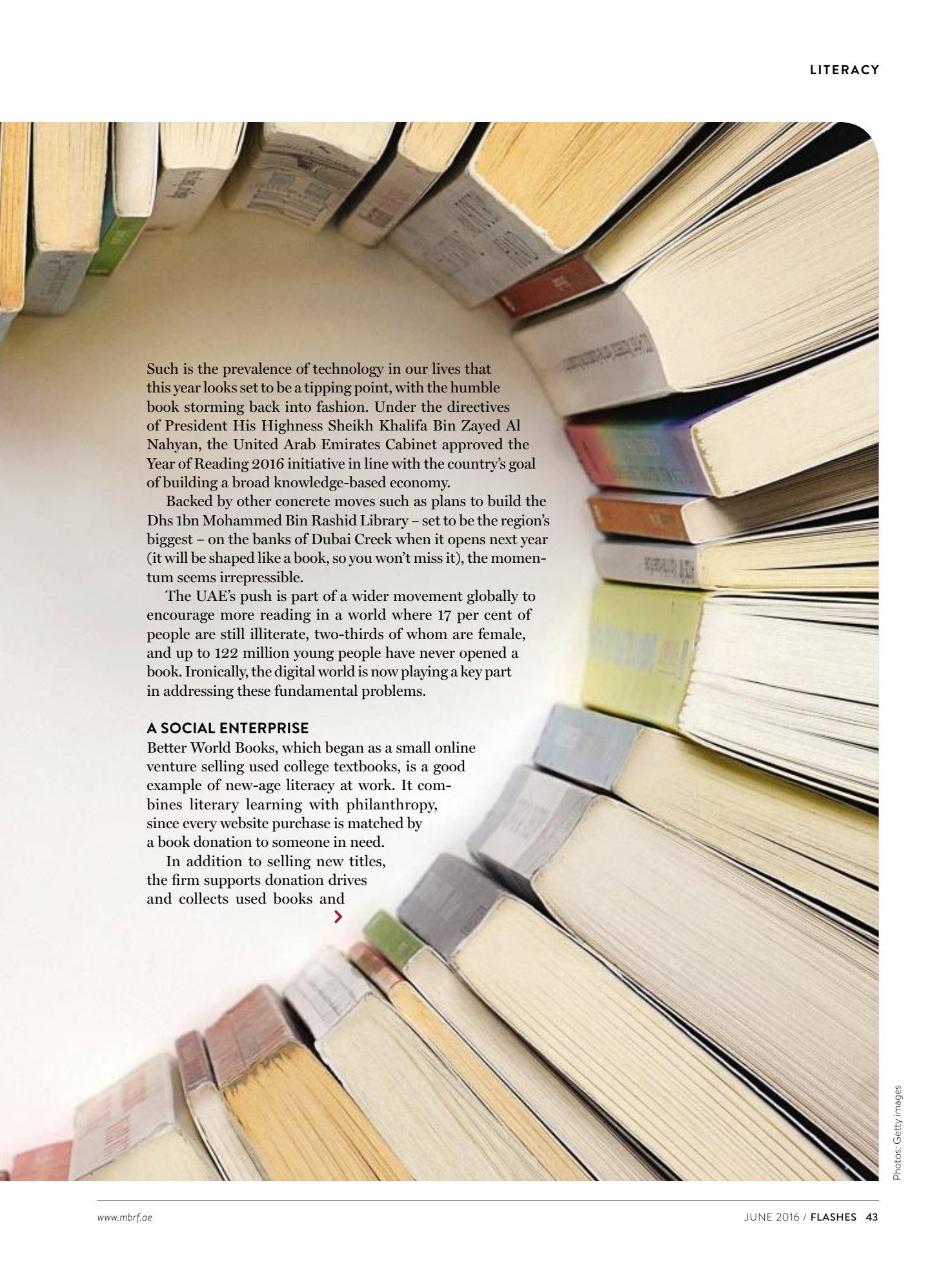
"We can do all of those three through modern technology – it's just today's way of learning."

*The books written in Abu Dhabi are free to download and can be found by searching for 'Kiwa Digital Middle East' at [www.apple.com/itunes](http://www.apple.com/itunes)*



## BOOKS THAT GIVE BACK

*Digital publishing may  
well spell the death of print  
– but social enterprises are  
breathing new life into the  
medium and countering  
global illiteracy*



Such is the prevalence of technology in our lives that this year looks set to be a tipping point, with the humble book storming back into fashion. Under the directives of President His Highness Sheikh Khalifa Bin Zayed Al Nahyan, the United Arab Emirates Cabinet approved the Year of Reading 2016 initiative in line with the country's goal of building a broad knowledge-based economy.

Backed by other concrete moves such as plans to build the Dhs Ibn Mohammed Bin Rashid Library – set to be the region's biggest – on the banks of Dubai Creek when it opens next year (it will be shaped like a book, so you won't miss it), the momentum seems irrepressible.

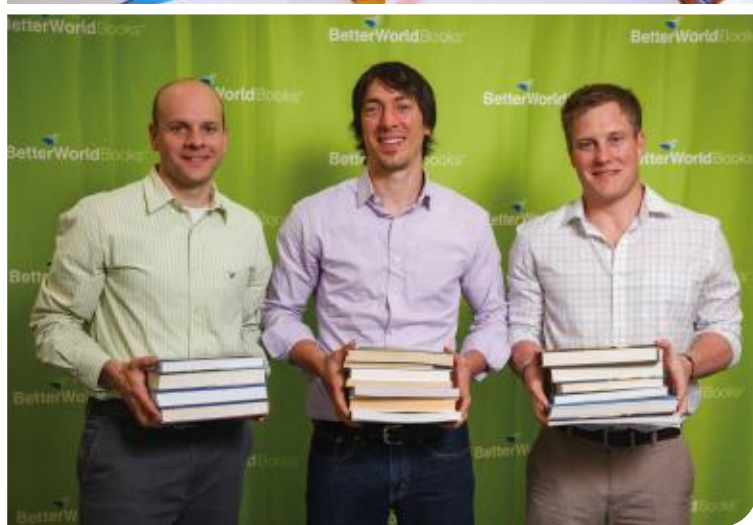
The UAE's push is part of a wider movement globally to encourage more reading in a world where 17 per cent of people are still illiterate, two-thirds of whom are female, and up to 122 million young people have never opened a book. Ironically, the digital world is now playing a key part in addressing these fundamental problems.

#### **A SOCIAL ENTERPRISE**

Better World Books, which began as a small online venture selling used college textbooks, is a good example of new-age literacy at work. It combines literary learning with philanthropy, since every website purchase is matched by a book donation to someone in need.

In addition to selling new titles, the firm supports donation drives and collects used books and





textbooks through a network of more than 2,300 college campuses and partnerships with more than 3,000 libraries across the United States. So far, it has donated in excess of 20 million books, raised more than Dhs 84.5m in funding for literacy and libraries and seen more than 234 million books reused or recycled.

Better World Books resonates with consumers globally, and not just because it ships books you don't need to people in need free of charge; it's what the organisation terms 'the triple bottom line' by focusing on profit, people and the planet (winning two Waste-Wise gold awards for paper reduction and climate change from the United States Environmental Protection Agency).

Partner organisation Books for Africa has delivered 34 million books in its 28-year history and shipped 2.4 million books last year alone. In 1988, founder Tom Warth visited the town library in Jinja, Uganda, and was dismayed to see sparse shelves in dire need of quality books. He returned recently with executive director Pat Plonski.

"We are all proud of what has been accomplished, yet aware of how much work is left to be done in combating the African book famine," says Warth.

### THE PRIMACY OF PRINT

Erin Yates, Books for Africa's database and development coordinator, says demand for each project varies, although the organisation has seen a particular spike in science books for all ages across schools and colleges. This would concur with research from Naomi Baron, a linguistics professor at American University in Washington, DC, whose survey of 300 students worldwide found 92 per cent still opt for physical books for "serious reading".

Paradoxically, both organisations are essentially reacting to the throwaway consumer, albeit one with a conscience. In an increasingly Kindle-led world, though, is there a real threat that the digital sphere will kill off the paper book, at least in the volumes on which charities such as Better

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**Left:** Better World Books' founders, Christopher Fuchs, Xavier Helgesen and Jeff Kurtzman



World Books and Books for Africa depend? Increasingly, across Africa technology is making major inroads, opening up the prospects for more direct e-book business as tablet prices fall and e-reader devices become more accessible (perhaps a site for second-hand devices will be the next big thing).

While traditionalists have been quick to seize on quarterly fluctuations in e-book sales, established publishers' market share is in decline, while sales of independently published e-books continue to grow. The overall trend remains clear; more of us are reading on our tablets and even smartphones.

Yet the UAE's huge investment in the written word comes at a time when many Western countries,

ravaged by budget cuts, are closing public libraries. Catch a flight from the UAE to Africa and reading is unlikely to be chief among the residents' concerns and one imagines access to reading resources is even more variable. We may live in a digital world, but much depends on where you live.

Perhaps we need to stop pitting print against digital and recognise the merits of each. Tim Waterstone, the founder of the UK's Waterstones chain of bookstores, believes books are so rooted in all our cultures that they'll still be around in 40 years' time. If that is the case, then Better World Books and Books for Africa should still be flourishing – and thousands of children in the developing world will have cause for celebration. †

### MORE READING INITIATIVES

Books for Africa isn't Better World Books' only partner. It also works with these American organisations...

### ROOM TO READ

Founded in 2000 in the belief that world change starts with literate children, Room to Read's innovative model focuses on deep, systemic transformation within schools in low-income countries during two of the most critical periods in a child's education – early primary school for literacy acquisition and secondary school for girls' education. Based in San Francisco, it works in collaboration with local communities, partner organisations and governments to develop literacy skills and a habit of reading among youngsters by the age of 12 and ensure girls can complete secondary school with the skills necessary to negotiate key life decisions. Room to Read has benefited 10 million youngsters across 17,500 communities in Asia and Africa and aims to reach a further five million by 2020. Learn more at [www.roomtoread.org](http://www.roomtoread.org)

### NATIONAL CENTRE FOR FAMILIES LEARNING (NCFL)

Based in Louisville, Kentucky, the National Centre for Families Learning has helped more than a million families make educational and economic progress since its foundation in 1989. Its pioneering family literacy programmes harness the strength of parent-child bonds to help those who are most at risk of failing economically, emotionally and socially. It builds success by strengthening participants' confidence, increasing their abilities and broadening their outlook. The results have an impact on a personal level as well as a national one. NCFL is supported by more than 150,000 teachers and thousands of volunteers who build relationships that support learning, from teacher to pupil and, most importantly, from parent to child. Learn more at [www.familieslearning.org](http://www.familieslearning.org)



Photos: Getty Images



## FROM SMALL SHOOTS...

*A conservation scheme is helping kids stay in school, study science and safeguard their families' future*

An educational initiative in rural India is equipping communities to meet the threat of climate change head-on by engaging children in conservation.

Every Child a Scientist (ECAS) teaches pupils aged nine to 16 the importance of biodiversity – the variety of plant and animal life in any given habitat. Its aims are twofold – to help youngsters become ambassadors for sustainable farming practices among their peers and to stimulate an interest in the study of science.

The scheme is run by the MS Swaminathan Research Foundation (MSSRF), a non-profit, non-governmental trust that develops strategies for economic growth in poor rural areas. Based in Chennai, it helps communities all over India to preserve the habitats of plants and animals whose fate is tied to their own.

### AGRICULTURAL AMBASSADORS

ECAS takes place in Wayanad District, a part of Kerala that falls within the Western Ghats mountain range. Many are members of the area's Panthalam tribe; most are from "socially and economically weaker" parts of society.

MSSRF's principal scientist, Girigan Gopi, says: "We give more priority to tribal children as they are most backwards in terms of economic parameters and education. The drop-out rate among them is exceptionally high.

"This programme is designed in such a manner that it will generate a pro-environmental attitude, create confidence and leadership skills among children, instigate curiosity to learn about nature and make learning a joyful experience."

He adds: "Young people are the future of a country. It is very important for the new generations to learn about biodiversity and climate change and to enable them to take part in addressing these threats, and come up with local solutions."

The ECAS programme aims to motivate children to study science by helping them understand current environmental issues such as climate change and pollution in relation to how it affects their surroundings. Participants are exposed to





**Left:** A shoot of rice, a crop that is vulnerable to the effects of climate change. Scientists are engineering varieties that are better able to withstand salt to mitigate against this threat

**Above right:** Children explore flora and fauna in the woods



various conservation methods to inculcate in them a desire to protect their environment.

By enhancing their knowledge of flora, fauna, habitats, ecosystems, natural resources and threats to biodiversity, the scheme helps them understand how intervention can counteract the destruction of threatened species at a local level.

Upon completion of the scheme, students are considered members of the Biodiversity Conservation Corps, tasked with spreading the word among their communities and peers. For instance, one team made a documentary about butterflies.

Gopi says: "As students of ECAS, they are keen to generate awareness among other students and the local community about biodiversity conservation and sustainable use of natural resources."

Many of them form "biodiversity conservation corps", he adds.

"They are also involved in generating greater awareness of biodiversity conservation, sustainable agriculture and integrated natural resource management." A summer holiday scheme with a difference ran from 4 April to 16 May this year.

Aimed at children aged 10 to 16 and called Venalkoottu, its blend of art and science offered a very different learning experience. Topics explored included astronomy and climate science as well as agriculture, biodiversity and other environmental issues.

Children were encouraged to explore their surroundings, observe nature and try their hand at farming while keeping logs on the various butterflies, reptiles and birds they encountered along the way. The scheme aimed to boost youngsters' observation and research skills, as well as leadership, communication and creativity.

#### HELPING CHILDREN TO THRIVE IN CLASS

School drop-out rates are high among the Panthalam pupils in Wayanad, a situation MSSRF aims to address by boosting pupils' confidence. Concerned, members of the ECAS team visited the area to take stock of the scale of the problem.

They identified nine youngsters aged from 10 to 15 who had stopped going to school for various reasons; some suffered from low self-esteem



**Left:** Pupils are visited at school and encouraged to get an education

**Below:** A purple sunbird, an endangered species, takes nectar from a bottle brush flower in Wayanad

while others received little encouragement from parents who were themselves illiterate or, in some cases, suffered from alcoholism. The children and their families received professional counselling and ECAS staff managed to persuade the children to return to class, conducting follow-ups to ensure they continued their studies. One of them now works as lab technician.

Koori, whose teenage son Anu took part in ECAS, says: "Thanks to the foundation, he got a job and a good education and doesn't have to do labouring work."

"He also developed his personality. Now he is more sociable and is not shy any more. I am very proud of him."

### MAKING CAREER DREAMS A REALITY

Other pupils are inspired to further their studies with the dream of becoming scientists themselves. Gopi says: "ECAS is formulated to supplement mainstream science curriculum and place an emphasis on life science."

"Students who are enrolled on the programme can be attracted towards a science-led career; our experience show that many participants perform well in their science subjects. Many pursue higher studies as well."

He adds: "At the same time, those who are pursuing their education in non-science subjects have expressed their affinity towards environmental conservation activities."

Former ECAS participant Prasad, whose



experience helped him land a job, says: "If MSSRF was not here to extend timely help, my fate would definitely have been different. Immediately after joining the ECAS programme, I recognised my hidden interest in identifying plant species."

"The days I worked in the MSSRF nursery and farm for daily wages were not a mere means for income but were really an opportunity for me to learn more about biodiversity conservation. It helped me to realise the valuable knowledge that my community possesses, especially in the area of biodiversity conservation and utilisation."

"Now I wish to become a good scientist who stands for the preservation of this traditional knowledge, ultimately for the conservation and sustainable utilisation of biodiversity." †



## MONA HATOUM

# FUNNY PECULIAR

*Subversive and dark yet with a dry sense of humour, Mona Hatoum's work speaks of a strange, disjointed world in which nothing is quite as it seems. We look back at the Beirut-born artist's influential career...*

Mona Hatoum says she believes life is largely down to chance. Now in her sixties, she has won international acclaim with her disturbing, mould-breaking oeuvre encompassing performance, video, sculpture and installation. Yet it all could have turned out rather differently.

Born in Beirut in 1952, she dreamt of becoming an artist from childhood, but her Palestinian parents had other ideas. Having fled their home in Haifa, near Nazareth, in 1948, they reasoned – with remarkable prescience – that a professional career would stand her in good stead should catastrophe strike again. By way of compromise, Hatoum studied graphic design and landed a secure but stultifying role in advertising – her ambition might have been shelved for good but for a dramatic twist of fate.

In 1975, she was visiting London when the Lebanese civil war broke out, plunging the country into 25 years of chaos. Unable to travel home, she was naturally worried about her family, yet being away from their watchful gaze gave her a great sense of possibility.

“I’d come from a place where everyone gossips about you, where people are always sticking their nose in your affairs,” she says. Yet this new-found freedom was dampened by the loneliness of living in a large foreign city not known for the warmth of its inhabitants. Making friends was hard.

“I was on my own, and having to work evenings and weekends to make ends meet; I suffered from colds all the time,” she says. “Sometimes I felt that if I dropped dead, no one would come to look for me.”

She was also unnerved by the seemingly Orwellian levels of surveillance.

“My first impression was the control of the individual, cameras pointing at you all the time,” she says.

“That’s why these things came into my work right from the beginning.”

Hatoum enrolled at art college in London, first Byam Shaw and later the equally prestigious Slade. There, she became active in the women’s right movement, among other causes, and she describes this period in





her life as a time of political awakening. Embodying the feminist rallying cry that ‘the personal is political’, she used her own body as a metaphor for social and political control. In her performance piece *Under Siege* (1982), she spent hours smothered in mud and trapped inside a transparent cubicle, repeatedly trying to climb out only to slide back down its walls as gallery visitors looked on.

### UNSETTLING INSTALLATIONS

The Nineties marked a dramatic shift in Hatoum’s work; upon landing a well-paid teaching post in Cardiff, Wales, she embarked on a series of increasingly ambitious installations.

A number of these were staged to look like rooms, with furniture, appliances and so on, appearing upon first glance to represent the average suburban living space. But upon further investigation something was always off-kilter; seemingly innocuous objects took on an air of peril. For instance, a wheelchair had daggers for handles while a prayer mat was embedded with nails. *Incommunicado* (1993) is a child’s cot strung with cheese wire where its mattress should be, while in *Homebound* (2000), kitchen utensils are linked by a live wire through which runs an audible electrical current.

Simultaneously evoking domestic drudgery and an atmosphere of dread, Hatoum’s work transformed the home from a place of sanctuary into somewhere decidedly unnerving.

In 2000, the Palestinian culture critic Edward Said explored her work in the essay *The Art of Displacement: Mona Hatoum’s Logic of Irreconcilables*, in which he said: “Domesticity is transformed into a series of menacing and radically inhospitable objects whose new and presumably non-domestic use is waiting to be



**Top:** *Homebound* 2000, Utensils, furniture, electrical wire, light bulbs, dimmer, amplifier and speakers

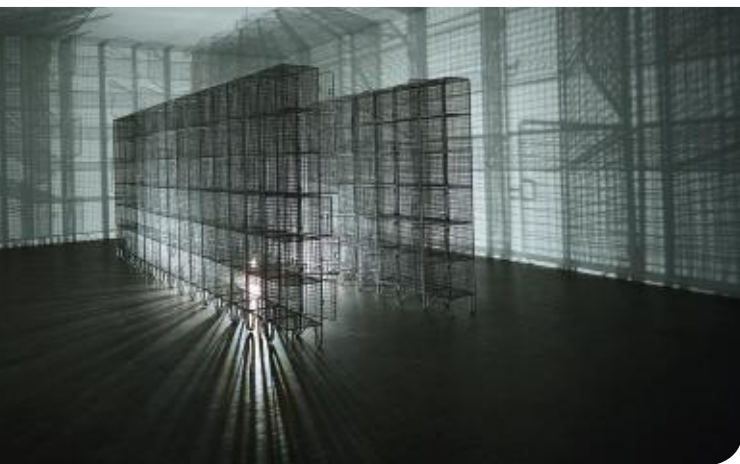
**Top right:** *Light Sentence* 1992, 36 wire mesh compartments, motor, light bulb

**Left:** *Grater Divide* 2002, mild steel

defined. An abiding locale is no longer possible in the world of Mona Hatoum’s art which, like the strangely awry rooms she introduces us into, articulates so fundamental a dislocation as to assault not only one’s memory of what once was, but how logical and possible, how close and yet so distant from the original abode, this new elaboration of familiar space and objects really is.

“Familiarity and strangeness are locked together in the oddest way, adjacent and irreconcilable at the same time. For not only does one feel that one cannot return to the way things were, but there also is a sense of just how acceptable and ‘normal’ these oddly distorted objects have become, just because they remain very close to what they have left behind.”

Other works explored her Palestinian heritage more directly. *Present Tense* (1996) is made of 2,200 cubes of traditional olive oil soap from Nablus, in the West Bank, in which lines of tiny red glass beads pushed into the surface trace outlines of territories that were meant to be returned to Palestinian control under the 1993 Oslo Peace Accord. A more recent installation, *Twelve Windows* (2012-13), comprised 12 pieces



of embroidery made by Palestinian women living in Lebanese refugee camps. Intended to represent windows, the fabric squares are suspended on intersecting steel cables, each reflecting a different region.

Said added: “No one has put the Palestinian experience in visual terms so austere and yet so playfully, so compellingly and at the same moment so allusively.”

### INTERNATIONAL RECOGNITION

The year 2016 is shaping up well for Hatoum. London’s Tate Modern is staging the first comprehensive British survey of her work; following on from a show at Centre Pompidou, Paris, last summer, it features about 100 pieces dating from the 1980s to the present.

She is also due to become the 10th recipient of Japan’s Hiroshima Art Prize, an accolade previously awarded to Pritzker-winning architect Daniel Libeskind, fellow artist Yoko Ono and fashion designer Yoji Yamamoto. Established in 1989 by the Japanese city and presented every three years, the award recognises the achievements of artists whose work has “contributed to the peace of all humanity”.

Over the coming months, Hatoum will produce works for the show that will address Hiroshima’s haunting legacy.

Its judges cited her exploration of social contradictions, such as the suffering of alienated people or political oppression, based on her own complicated circumstances as a Palestinian exile.

Upon accepting the award, she said: “I accept the prize with the deepest gratitude. I am greatly honoured and humbled to be associated with the ideals of world peace for all humanity that the spirit of Hiroshima stand for.

“Hiroshima’s experience brings to mind a very sad and low point in human history. However, the resilience and rebuilding of the city after its total annihilation embodies the spirit of hope that inspires us all.”

*Mona Hatoum runs at Tate Modern, London, England, until 21 August. To learn more, visit [tate.org.uk](http://tate.org.uk) or follow @tate #MonaHatoum*

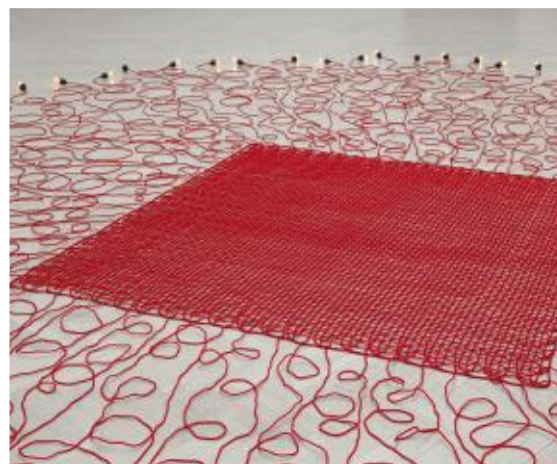
CLARRIE WALLIS, THE CURATOR OF MONA HATOUM AT TATE MODERN, LONDON, DISCUSSES TWO OF HER FAVOURITE PIECES FROM THE SHOW...



Agostino Osio, courtesy of Fondazione Querini Stampalia

### HOT SPOT III 2013

♦ “What is particularly important about Mona is how she is able to transcend local issues and create something that is universal. And this is really what this work is about. Mona talks about it being an idea of a world that is continually in conflict and unrest and the idea that it’s a global situation, so it’s not really about the local, it’s about the universal. The term ‘hot spot’ refers to a place of military or civil unrest. Using delicate red neon to outline the contours of the continents, the sculpture presents the entire globe as a danger zone – what Mona describes as a ‘world continually caught up in conflict and unrest.’”



Stefan Rohrer

### UNDERCURRENT (RED) 2008

♦ “Here Mona has worked with electrical cables to create an extraordinary floor work which feels like it has a life of its own. It feels like it’s breathing and pulsating, so it feels like a very fitting and dramatic end to the exhibition (it’s in the last room) and is very much in keeping with the ideas that have come before.”

## OVER THE RAINBOW

*Take a trip across the spectrum as we see how our ancestors coloured the world...*

Glance around a gallery, fashion store or even your own home and you'll spot items of every imaginable hue. But that wasn't always the case. Throughout history, the use of paint, dye and ink has been governed by geography, wealth and local knowledge, influencing the names, usage and meanings we assign to different shades.

### PREHISTORY

Cave dwellers had a limited palette with which to decorate their homes, relying on the so-called earth pigments of red and yellow ochre plus chalk and either burnt bones or charcoal for black. Prehistoric humans travelled far and wide to top up their art supplies; at almost every site of prehistoric paintings, from South Africa to Australia, trails lead to haematite deposits where evidence of mining activity can be found. In Lascaux, south-west France, a region renowned for its Palaeolithic cave paintings, it's thought people may have travelled 25 miles in search of the iron-rich ore.

### ANTIQUITY

The use of colour in Egyptian artwork was highly symbolic and strictly regulated. Painters primarily used a palette of red, green, blue, yellow, white and black and manufacturing colours became a serious business from about 4000 BC. A number of pigments were discovered during the height of Egyptian civilisation, the most famous of which was Egyptian blue. First made



around 3000 BC from calcium copper silicate, it is considered to be the first synthetic pigment.

Lapis lazuli has been mined since 7000BC in parts of Iran, Afghanistan and Pakistan. The mineral was later crushed by the Egyptians, who prized its intensity and durability, and it was also used in jewellery.

The Egyptians used a number of other minerals, notably blue azurite and green malachite and two forms of arsenic; yellow orpiment was imported from Syria, while for orangey-red shades they used realgar, the name of which is derived from the Arabic term for arsenic, 'rahj al-Ḍḍr', literally 'dust of the cave'. Among the artefacts found in Tutankhamun's tomb was a small paintbox containing powdered orpiment, ochre and malachite.

Yet another innovation was the use of kermes. This vivid red dye, obtained from the crushed bodies of female scale insect, was used on fabric and manuscripts; its name is derived from the Arabic word qirmiz, which is also related to 'crimson'.

The Greeks inherited the Egyptians' vibrant colour palette but soon developed an entirely new set of pigments. Chrysocolla was initially used to fix precious metals to surfaces (its name means 'gold glue'), yet this greenish-blue mineral soon acquired decorative properties in its own right.

Sepia was obtained from the cuttlefish or octopuses found in the Adriatic and Mediterranean seas. These creatures squirt dark ink as a defensive measure and the sacs containing the liquid were removed.

### THE MIDDLE AGES

Indian yellow was first made in a region close to the present-day borders of Bangladesh and Nepal. It was produced by feeding cows nothing but mango leaves, causing their urine to become bright yellow. This was collected, mixed with a solidifying agent



**Top left:** Egyptian scroll featuring malachite, orpiment, iron and calcium copper silicate  
**Left:** Cochineal made from crushed beetles



and formed into lumps, ready for sale. It was a popular ingredient in watercolour paint until the Indian government banned its manufacture on the grounds of animal cruelty.

Italians of the Middle Ages and Renaissance made many significant contributions to colour chemistry. Their most important contribution to colour technology, made in the 14th and 15th centuries, was a method for producing the brilliant-blue pigment ultramarine. Its name comes from the Latin *ultramarinus*, literally 'beyond the sea', because it was extracted from rocks containing lapis lazuli that had been imported from Afghanistan.

These minerals occur in close proximity, and the blue blocks were ground into a fine powder so the latter could be extracted. Ultramarine was so expensive that its use was reserved for

depicting the clothes of religious figures such as the Virgin Mary.

#### THE MODERN AGE

Cobalt ore has been used since the Bronze Age to impart a rich blue colour to glass and glazed ceramics. Smelting the ore released highly toxic and volatile arsenic oxide. And in medieval times, superstitious Saxons blamed the resultant deaths and illness on malevolent forces.

In 1735, the ores were found to be reducible to a new metal – the first discovered since ancient times – and therefore the element was named kobold after a mythical German spirit believed to haunt mines and caves.

Cobalt oxide produced an intense purple-blue glass, the world's first true violet pigment. It was ground up and used to brighten white laundry until

the 19th century. Scientific research into colourants gathered momentum towards the close of the 1800s, spurred on by growing demand for textile dyes as the Industrial Revolution gathered pace. New colours and chemically enhanced versions of established shades sprang up with regularity.

The synthetic shade chrome orange was used extensively in Frederic Leighton's 1895 painting *Flaming June*, which features a sleeping woman wearing a flowing flame-coloured gown.

Among the pigments discovered in the 20th century, the most important is titanium. Although it was discovered in 1821, mass production of brilliant-white paint only began in the early 1920s. Prior to that, only creamy shades were available – hard to imagine in the modern world, in which stark white walls are de rigueur. †

# FLASHES

A MONTHLY MAGAZINE ON KNOWLEDGE AND DEVELOPMENT  
BY MOHAMMED BIN RASHID AL MAKTOUM FOUNDATION



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# 2016



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