A helping hack

Can technology make the world a better place?

This enticing proposition is being put to the test in Jordan by training refugees from Syria.

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Photo: Jonas Opperskalski

Fatema Hammami does not look like the usual western idea of a computer geek: the 26-year-old Syrian wears a hijab in the office and a baggy coat down to her ankles. But computers are her life – her new life. Without her work in a unique IT project, her family of nine could not survive. Five years ago Hammami fled Aleppo in Syria with her mother and seven brothers and sisters to neighbouring Jordan. One of her brothers works as a graphic designer, but Hammami earns twice as much as him. "It is still difficult," she says, "but thanks to my salary our situation is stable now."

The United Nations has registered 656,000 Syrian refugees in Jordan. The Jordanian government estimates there may be as many as 1.3 million. That would mean one in five of the kingdom's population is a refugee – which is like Germany taking in 17 million people, or Britain or France taking in 13 million. Jordan is a small country with few natural resources and it cannot cope with such an influx. It is chronically dependent on development aid; the public sector is bloated and the

private sector hampered by corruption and nepotism. International aid groups and local non-governmental organisations (NGOs) alleviate the greatest need but, according to Amnesty International, 80% of Syrians in Jordan are living below the poverty line.

This situation has alerted the tech scene, which has promised countless times to make the world a better place. But what may seem do-able in San Francisco or Berlin, where the life is reasonably good even without the latest taxi app, has yet to be achieved in the harsh reality of the Middle East's dusty refugee camps.

ReBootKamp trainees competing to learn programming

'Hacking a Better Future'

On a winter's morning in February, the King Hussein Business Park in the north-west of Amman, Jordan's capital, is still dozing, the sunlight is still weak and few people are out and about. With its green spaces, and banks and coffee shops dotted between office buildings, the business park looks like a university campus. It is in fact the heart of the country's hi-tech sector: international concerns such as Cisco and Microsoft have offices here, along with several Jordanian IT firms and a startup incubator. This morning 31 young men and women are gazing at laptops in a hall in one building. There is a kitchenette, multi-coloured bean bags and table football, but the young people don't take their eyes off their screens.

These men and women are being trained as software developers in an intensive 18-week course. The project is called ReBootKamp, or RBK, and its motto is

"Hacking a Better Future". This is where Hammami was trained and where she now works as a mentor. The concept originated in the USA, where coding "boot camps" have proved popular for years. The emphasis is on teaching the kind of programming skills that industry needs. There is no time for theory. Critics carp at a lack of depth compared with a university course in computer science, but most of the boot-camp graduates find well-paid jobs as software developers. The RBK in Amman is the first time the concept has been transplanted to the Arab world and it has a special purpose: many of the participants are refugees, including 15 Syrians, two Iraqis and two Yemenis.

The idea to export the concept from Silicon Valley to the Middle East was the brainchild of Hugh Bosely, a 55-year-old American. Wearing a corduroy jacket and woollen cap, Bosely sits to one side and watches his trainees. They call him Mr Hugh here, with a mixture of respect and familiarity.

He had been an architect in San Francisco for 25 years when a Syrian friend arrived on his doorstep one day in 2013. She had organised protests against the Assad regime in her home country, and had been arrested, tortured and raped. "She turned up with a broken back and feet that no longer bore any resemblance to human feet," says Bosely. "I spent the next year and a half putting her back together again. In the process, I learned a lot about this part of the world."

Hugh Bosely is bringing about change with the ReBootKamp project in Jordan

Fatema Hammami earns twice as much in computing as her brother does as a graphic designer

'We want to turn consumers into producers' – Nadine Tuhaimer

He began to get involved in 2014, visiting the Zaatari refugee camp in northern Jordan, the country's fourth largest "town" with 80,000 inhabitants. "I spotted all the intellectual potential lying dormant in the camps, thought of the big demand for software developers and put two and two together." He called his contacts in Silicon Valley, persuaded Hack Reactor, one of the US boot camp pioneers, to join in and raised $50,000 (£40,000) from investors. In May 2016 he launched a trial with 40 participants, selected from hundreds of applicants. Only 17 completed the course. Four never turned up and others dropped out. It is a tough programme: officially, participants have 13 teaching periods a day, but they are often still working on their assignments until late at night.

The Information and Communications Technology Association of Jordan has complained for years about high unemployment among the 6,000 people a year who graduate in IT from universities there. But the problem seems to lie more in their training than lack of demand. Three-quarters of IT firms in Jordan report problems finding suitable applicants. Criticisms include lack of technical skills, poor command of English and applicants not being team players. ReBootKamp fills this gap: the teaching is in English and the trainees work in changing groups. That may well be why all 17 of the initial graduates found jobs.

One of them is Rana Kelani, a 30-year-old from Hama in the west of Syria. She previously scraped a living from temporary jobs. Now she is working as a web developer for a Jordanian startup called ArabiaWeather, which produces forecasts

and apps for the Arab world. Kelani earns 700 Jordanian dinars a month (€935 or £800). It is a modest sum by western standards, but twice what she earned before. "RBK has changed my life," says Kelani. It is no empty phrase. She is the only one of six siblings to have found a job in Amman.

Last November, Bosely selected another 40 participants to begin a second round. Though RBK is a not-for-profit organisation, Bosely says: "We're not handing out any presents here." He charges course fees of more than €6,500, to be paid later from income. He also charges commission from the companies that employ his graduates. In two years RBK should be self-financing. Until then it all depends on the sponsors. The United Nations supports the project and the Jordanian royal family provides office space in the business park free of charge. Now Bosely is looking for more sponsors so he can set up ReBootKamps in Lebanon and Turkey.

Rapid help: artificial limbs from the 3D printer

Economic self-help

RBK is a Western project. The founder, the method and most of the volunteer helpers come from the USA. But the Jordanian tech scene is also reacting to the refugee crisis. 3Dmena is a Jordanian startup specialising in 3D printing that is based in the same building as RBK. Its founder, Loay Malahmeh, is at a conference in Barcelona so we are led through the little lab by Nadine Tuhaimer, a young computer scientist wearing a hijab and dark lipstick. There's a jumble of plastic

parts and cables, and several 3D printers along the wall.

In 2014 the firm attracted international attention when it produced prototype 3D-printed artificial limbs for refugees. One is still in the lab: a little grey hand bearing the logo of the American comic hero Ben 10. It was developed for a boy from Yemen. The prosthetic – fitted with simple electronics – only cost $75, says Tuhaimer, a fraction of the usual cost.

The firm is not making any artificial limbs at present as the project was only intended to demonstrate the possibilities of 3D printing. Now 3Dmena is advising a Jordanian army hospital on setting up its own 3D printing lab. It also has a stake in Shamal Start, a consortium of several firms and NGOs supported by the European Union that is building a startup incubator in northern Jordan. The idea is to boost the local economy and create jobs for Syrians living in the region. 3Dmena offers 3D printing workshops for young Syrians to produce objects they need, from side arms for spectacles to a spare part for a wheelchair. "We can make producers out of consumers," says Tuhaimer.

3Dmena was one of the first Jordanian firms aimed at refugees, but a trend is now developing in the tech scene. A US 3D printing startup called Mixed Dimensions is planning a student competition to develop technical solutions for refugees' most urgent needs, while Jordanian firms such as Salasil, which develops e-learning apps for school pupils, are trying to persuade the leading relief organisations to use their products in refugee camps.

The biggest aid groups are refocusing on refugees, as could be seen at the No Lost Generation EdTech (educational technology) conference held in Amman in March. Organised by relief organisations such as World Vision and Unicef, the United Nations Children's Emergency Fund, it gathered together private-sector firms, NGOs and state players to explore the opportunities of IT-based educational assistance for refugees and to launch new collaborations. More than $210,000 starting capital was on offer for promising ideas.

The modern side of Amman: the King Hussein Business Park

Vision and reality

At a roundtable discussion on the contribution of the private sector, a local Cisco representative sat next to two Google employees who had flown in from Dublin. The Cisco man promoted his firm's free online programming courses, while the Google envoys outlined plans to develop innovative solutions for NGOs. "We have the tools to help you," said the woman from Google. With deadpan humour, a startup founder from Finland said: "First we want to solve all the conflicts in this region and then we'll deal with the serious problems."

Listening to these young ambassadors of technology with their styled hair, you might wonder why there are still any refugees who have not long since retrained as software developers. But the reality is rather different. Forced from their homes by war, many Syrians have not been to school or university for years. Many do not speak English, so most online courses are beyond them.

Then there are the financial constraints. Many who had to drop out of their studies in Syria are now stuck in badly paid temporary jobs. Relief organisations such as Unicef report a sharp rise in child marriages among Syrians in Jordan, with girls dropping out of school – if they ever went. These are just a few of the problems. But they give some idea of the obstacles barring many Syrians from online courses, educational apps and incubator programmes.

Of course, there are refugees such as Rana Kelani, for whom the new opportunities are life-changing, and products such as e-learning apps or

inexpensive artificial limbs can solve problems in the short term and assist the work of humanitarian organisations. But many of the tech projects are aimed at a young, privileged minority who are quick to learn, speak English and, in the case of young women, have parents who allow their daughters to take up a career. No app or incubator will be enough to reach all the refugees, to ease their distress and enable them to take back control of their lives. Nearly four in 10 Jordanians aged between 15 and 25 are unemployed. In order to integrate hundreds of thousands of Syrians in a labour market that has little to offer its own young citizens, the country must first get its own weak economy into better shape.

Bosely is hoping that one day his graduates will help to bring that about. "Thousands of software engineers like these can boost Jordan's gross domestic product by billions of dollars." Perhaps he is right. But before that happens, the greatest achievement of the tech initiatives is probably to be found elsewhere: in giving people a bit of independence back.