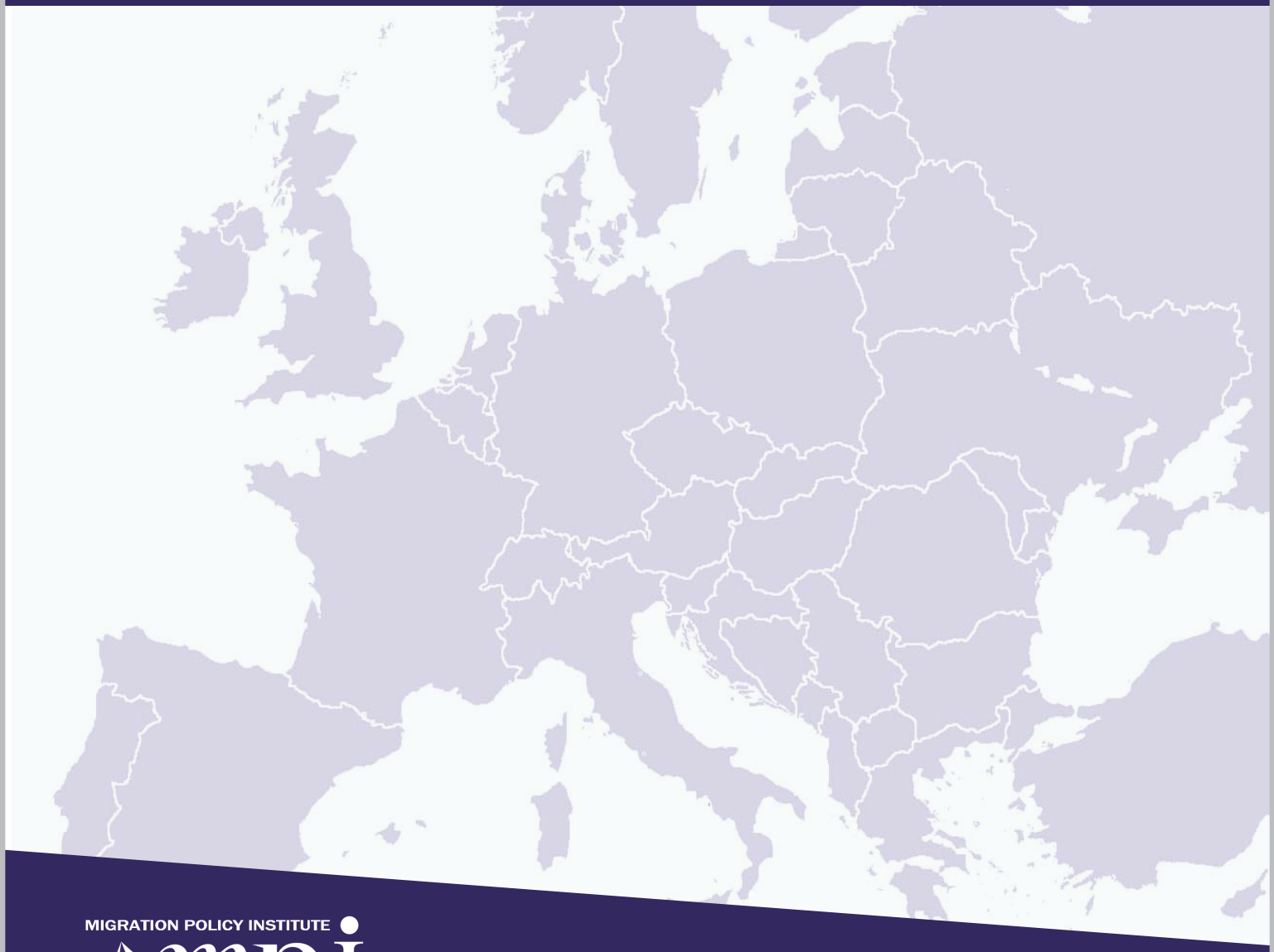
TECH JOBS FOR REFUGEES

ASSESSING THE POTENTIAL OF CODING SCHOOLS FOR REFUGEE INTEGRATION IN GERMANY

Integration Futures Working Group



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October 2018

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ACKNOWLEDGMENTS

This research was commissioned for a meeting of the Integration Futures Working Group held in Barcelona, Spain in September 2017. The theme of the meeting was 'Economic and Social Integration in a Changing World of Work', and this report was among those that informed the working group's discussions. It builds on earlier research supported by the German Federal Ministry of the Interior and published in 2017 by betterplace lab as *Digital Routes to Integration: How Civic Tech Innovations Are Supporting Refugees in Germany*. The author thanks the coding-school staff and alumni and other interviewed professionals for sharing their insights, Meghan Benton of the Migration Policy Institute (MPI) for her input in developing the research design, and Olivia Judson for comments on an earlier draft.

The Integration Futures Working Group is a MPI Europe initiative that brings together senior policymakers, experts, civil-society officials, and private-sector leaders to stimulate new thinking on integration policy. It is supported by the Robert Bosch Foundation.

For more on the Integration Futures Working Group, visit: www.migrationpolicy.org/programs/integration-futures-working-group.

Cover Design: Danielle Tinker, MPI
Layout: Sara Staedicke, MPI

Suggested citation: Mason, Ben. 2018. *Tech Jobs for Refugees: Assessing the potential of coding schools for refugee integration in Germany.* Brussels: Migration Policy Institute Europe.

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EXECUTIVE SUMMARY

The sheer scale and speed of refugee arrivals to Germany between 2015 and 2016 created significant challenges for reception, social, and employment services. With many traditional service providers overwhelmed by this sharp increase in demand, new actors and new programmes emerged to help newcomers find their footing in German society. It became a time of intensive experimentation and innovation. One promising ideas to come out of the refugee and migration crisis in Germany was a set of coding schools that offer courses on software development for refugees. With Germany facing an ageing population and fast-growing skills shortages in the information technology (IT) sector, civil-society organisations, policymakers, and many refugees themselves have been captivated by the prospect of tech jobs offering a rapid pathway to full economic integration.

Since 2015, a number of refugee coding schools have been launched—five in Germany alone, and at least another 11 in other countries. These include Devugees (a social enterprise, and the only coding school to have succeeded in becoming a certified provider of vocational training in Germany); the ReDI School of Digital Integration (a civil-society organisation that has received extensive media attention and boasts more than 350 graduates); and CodeDoor (a nonprofit organisation that focuses on supporting self-guided learning and is expanding to serve other disadvantaged groups).

Civil-society organisations, policymakers, and many refugees themselves have been captivated by the prospect of tech jobs offering a rapid pathway to full economic integration.

There are several reasons coding jobs—in theory at least—lend themselves to the specific situation, skills, and needs of refugees. Tech jobs have higher salaries and are associated with a higher social status than many of the lower-skilled jobs accessible to newcomers. Many tech jobs also lack some of the barriers to entry of other high-skilled fields in Germany: the working language is often English, and many employers value competence and ability more than official qualifications (a rarity in Germany's qualification-driven labour market). Finally, software-development skills are highly portable, making them ideal for refugees who choose to return to their home countries or move elsewhere.

Many of these benefits are borne out by interviews with coding-school staff, refugee alumni, and professionals from the IT sector conducted to inform this research.[1] Yet the value of IT jobs for refugees is far from assured and depends on a complex array of factors. Software developers work in a range of employment settings, from tech start-ups to larger companies and consultancies; some have tech roles within non-tech companies. The type of organisation shapes the skill set needed—and the extent to which roles are open to refugees.

Analysis of both the promise of coding schools and the factors that can amplify or hinder their success suggests the following:

- ***English language skills are often sufficient for newcomers to get by, but German skills are still helpful.*** Tech jobs are in many ways more flexible than other occupations when it comes to language. Coding languages are themselves based on English, for one thing, making it possible to get by without proficiency in German. However, this is not universal across workplaces. Some small teams may resent having to switch to English to interact with colleagues, or simply prefer German-speaking candidates.

1 To inform this study, the author conducted 15 interviews with people from three groups: (1) managers of and teachers in refugee coding schools, (2) students and alumni of refugee coding schools, and (3) professionals in the information technology (IT) sector who shed light on what qualifications a candidate might need to get a job in the field. While effort was made to include a diverse set of perspectives, this small set of interviewees cannot be regarded as a truly representative sample.

- ***Degrees are not the only path to a tech career, but they still carry weight.*** Unlike many high-skilled jobs in the German labour market, it is possible to be a software developer without a degree. Coding boot camps are now well established in the United States (and increasingly, Germany and the United Kingdom). Some interviewees went one step further and argued that more traditional computer science degrees earned at universities offer little practical training. Still, all else being equal, many hiring managers may still choose a candidate with a degree.

- ***Interpersonal and intercultural skills are important for workplace success.*** Despite the stereotype of coding professionals as loners, interviewees emphasised the importance of teamwork, soft skills, and understanding social norms. Several refugees noted that learning about the culture of the German workplace, rather than coding skills alone, enabled them to work well in a team setting and advance professionally.

- ***Demonstrating the ability and drive to keep learning is vital for professional success.*** Software development is fast moving and thus differs from professions or crafts that involve a stable body of received knowledge and/or skills. Even experienced developers need to keep abreast of changing technologies. As a result, employers seeking to hire developers are typically far more interested in transferable skills such as rapidly mastering new coding protocols and continual self-directed learning than in specific knowledge of a particular software language.

The centrality of higher-level cognitive and soft skills, such as learning how to learn, makes software development both more and less accessible to refugees. Formal barriers (such as education and language) are of relatively little importance, leaving the door open for those resilient and self-motivated enough to take advantage of tech opportunities. But refugees without such traits and skills are unlikely to be able to take advantage of these pathways. In reality, coding schools are likely to help only a small number of refugees get jobs—but the importance of this should not be overlooked. The spill-over effects of even modest success are far reaching. They include higher incomes for families and social networks (a large share of which may be other refugees), and, perhaps, a more positive perception of refugees among the host community.

Policymakers looking to support coding schools could focus on making the systems for certifying educational institutions more flexible, as these have proven ill-suited to the fast-moving nature of the tech industry.

Moreover, some coding schools have embraced opportunities to reach a broader constituency by offering more or less comprehensive training. Devugees, for example, offers an introductory course that lets students get a taste of coding before jumping into a full programme, while the ReDI School allows people to sign up for one or two courses at a time, allowing students to learn at their own pace. Coding schools can also offer training in skills (from problem-solving to technical proficiency) that will be useful even for people who do not ultimately become software developers.

There is a strong case for public investment in coding schools, given their potentially large payoffs—especially in countries such as Germany that are struggling to meet the IT sector's demand for skilled workers. Policymakers looking to support coding schools could focus on making the systems for certifying educational institutions more flexible, as these have proven ill-suited to the fast-moving nature of the tech industry. To be eligible for public funding, training providers must meet complex regulatory requirements such as having all curriculum changes checked by a certification body and having all instructors pass a German language test. If governments want to pave the way for greater innovation and maximise coding schools' potential to foster refugee integration, they should consider adjusting the rules to better suit these evolving institutions.

I. INTRODUCTION

In 2015 and 2016, more than 1 million refugees arrived in Germany.[2] The scale and speed of these inflows placed considerable strain on reception and social support structures, including those tasked with receiving and housing newcomers and processing asylum claims. Although some of the sense of emergency has now dissipated, the long-term challenges of getting refugees into jobs and helping them integrate into German society have not. Labour-market integration is crucial for the wellbeing of both refugees and their host communities. For refugees, the benefits of employment are not only financial but also psychological and social. For host communities, it reduces the number of people depending on state support and increases contributions to the economy, and specifically to tax revenues. Refugee employment also creates opportunities for intercultural contact and exchange.

Labour-market integration is crucial for the wellbeing of both refugees and their host communities.

As policymakers look for ways to bolster refugees' labour-market integration, one promising area of focus is the German information technology (IT) sector. The sector is growing steadily, becoming increasingly important for the national economy.[3] Meanwhile, available and suitable workers are scarce.[4] As of September 2016, there were 51,000 unfilled IT positions within the German economy as a whole.[5] This marks a steady rise from 2009, when the number was 20,000.[6] In one survey of IT company representatives conducted in 2016, 70 per cent agreed that there was an overall lack of IT specialists.[7]

These rising skills shortages are occurring against the backdrop of broader demographic changes in Germany, where an ageing population is contributing to a shrinking workforce.[8] In the summer of 2015, the German government explained its decision to adopt a welcoming policy towards Syrian refugees on humanitarian grounds. However, commentators in Germany and elsewhere were swift to point out that the influx of migrants, if well managed, could help ameliorate the demographic pressures on the country's economy.[9] Thus the question of meeting humanitarian responsibilities was, from the onset of the migration crisis, closely tied by some observers to an economic argument for refugee admissions.

2 German Federal Office for Migration and Refugees (BAMF), *Aktuelle Zahlen zu Asyl: Ausgabe Dezember 2016* (Nuremberg: BAMF, 2016), www.bamf.de/SharedDocs/Anlagen/DE/Downloads/Infothek/Statistik/Asyl/aktuelle-zahlen-zu-asyl-dezember-2016.pdf?__blob=publicationFile.

3 Bitkom, an industry association, estimated that the IT sector generated 86 billion euros (USD 98 billion) in revenue in 2017. It also estimated that by the end of 2017, the sector would employ 850,000 people, an increase of 24,000, or nearly 3 per cent, from 2016. See Bastian Pauly, 'Bitkom-Branche schafft in diesem Jahr 21.000 neue Jobs', Bitkom e.V., 7 March 2017, www.bitkom.org/Presse/Presseinformation/Bitkom-Branche-schafft-in-diesem-Jahr-21000-neue-Jobs.html.

4 Concerns about the shortage of qualified labour in the IT sector have existed for years and are growing more acute. In 2012, for example, Dieter Westerkamp of the German Association of Engineers (VDI) warned at the CeBit IT convention that if the problem was not addressed, Germany risked losing its competitive advantage. See Focus Online, 'IT-Branche kann Jobs nicht besetzen', Focus Online, 5 March 2012, www.focus.de/finanzen/karriere/perspektiven/fachkraeftemangel-verschaerft-sich-it-branche-kann-freie-jobs-nicht-besetzen_aid_720659.html.

5 Of these, around 20,000 were within the IT sector itself and around 30,000 were IT positions within other sectors. See Achim Berg, *Der Arbeitsmarkt für IT-Fachkräfte* (Berlin: Bitkom, 2016), www.bitkom.org/Presse/Pressegrafik/2016/November/Bitkom-Charts-IT-Fachkraefte-14-11-2016-final.pdf.

6 Only 2012 deviated slightly from this pattern. There was a sharp drop from 2008 to 2009, presumably related to the global financial crash. See Berg, *Der Arbeitsmarkt für IT-Fachkräfte.*

7 See ibid.

8 Larry Elliott and Julia Kollewe, 'Germany Faces up to Problem of Ageing Workforce', *The Guardian*, 17 March 2011, www.theguardian.com/world/2011/mar/17/new-europe-germany-retirement-pensions-exports.

9 For example, see Nina Adam, 'Migrants Offer Hope for Aging German Workforce', *The Wall Street Journal*, 10 September 2015, www.wsj.com/articles/migrants-offer-hope-for-aging-german-workforce-1441928931.

As early as August 2015, and with arrivals increasing sharply, the national publication Spiegel Online ran an article about several sectors that were placing hopes in refugees as future employees. The article listed software development alongside engineering, nursing, and several lower-skilled professions, such as baking.[10] In September 2015, Bitkom President Thorsten Dirks touted the prospect that refugees might fill gaps in demand for programmers, saying: 'Many of the refugees are young, highly educated, and motivated … We should seize this opportunity'.[11] A month later, in October 2015, a trade association produced a 19-page set of guidelines for employers hiring refugees.[12] This flurry of attention has produced high hopes for programmes that support refugees in entering tech jobs, though so far little is known about which models work well and how policymakers can best support such efforts.

This report examines the rationale for training refugees for tech jobs and takes stock of the progress made by coding schools that have popped up in Berlin and beyond. It also examines whether the potential benefits of coding schools could extend beyond the number of newcomers who become professional software developers, for example by providing transferable skills relevant for other professions, as well as psychological and social support. The study concludes by offering recommendations to policymakers in Germany and elsewhere.

II. SOFTWARE DEVELOPMENT AND REFUGEES: A NATURAL FIT?

The rationale for training refugees for software development jobs is more compelling than simply matching a high demand for workers with a potential source of talent. In theory, at least, a career in software development may be particularly suitable for refugees in Germany (and for migrants and other national settings more broadly) for four key reasons: high income levels, relatively high social status, few barriers to entry, and portability of skills.

In theory, at least, a career in software development may be particularly suitable for refugees in Germany.

Proficient software developers may expect high salaries and the respect of colleagues and society at large. Unlike the many low-skilled occupations that newly arrived immigrants and refugees may find it easiest to pursue—amid language barriers, limited social networks, and difficulties gaining recognition for qualifications and skills earned in other countries—tech jobs are often more secure and pay a family-sustaining wage.

10 Alexander Demling, 'Diese Branchen hoffen auf die Flüchtlinge', Spiegel Online, 7 August 2015, www.spiegel.de/wirtschaft/soziales/fluechtlinge-diese-branchen-hoffen-auf-arbeitskraefte-a-1047238.html.

11 Author's translation of the quotation: 'Viele der Flüchtlinge sind jung, gut ausgebildet und motiviert. Sie wollen aktiv werden und arbeiten, sie wollen ihre neue Chance nutzen—und wir sollten diese Chance auch nutzen'. See Achim Sawall, 'Zahl der offenen Stellen in der IT stark angestiegen', Golem.de, 30 September 2015, www.golem.de/news/softwareentwickler-zahl-der-offenen-stellen-in-der-it-stark-angestiegen-1509-116601.html.

12 Verband Organisations- und Informationssysteme e.V. (VOI), *Leitfaden für die Beschäftigung von geflüchteten Menschen in der IT-Branche* (Bonn: VOI, 2015.

Relative to other sectors, careers in software development may also be less vulnerable to obsolescence due to automation. As the use of computers and mobile phones becomes even more widespread, and manufacturing, agriculture, and other sectors take up tailored, 'smart' software,[13] demand for skilled IT workers is likely to continue to grow.[14]

There are also reasons to believe that tech jobs offer a way to circumvent the traditional language, discrimination, and qualification barriers some newcomers face. The IT workforce is highly international, and many workplace practices reflect this. The working language is often English (which newly arrived refugees are more likely to speak than German). Across the IT sector internationally, there is a growing number of initiatives to promote diversity.[15] Perhaps most important, the IT sector is known to assess candidates based on competence and ability rather than formal qualifications. This is especially significant in a German context, where many vocations require highly formalised training and certification.[16] As such, this could be invaluable for newcomers who have earned certifications elsewhere but are unable to produce documentation of them or have them recognised in Germany.

Finally, software development is a highly portable skill set. The role of a developer is broadly similar anywhere in the world, coding languages translate across borders, and remote work is commonplace. Hence people who have mastered this skill-set are likely to remain employable if they move internationally (e.g., should refugees wish to return to their home country postconflict).

A. Refugee coding schools in practice

Motivated by the factors described above, civil-society initiatives and social enterprises have created schools, programmes, and organisations dedicated to training refugees in software development. Out of 16 such projects worldwide identified during this research, five are in Germany (see Table 1).

13 Lydia Dishman, 'Why Coding Is Still the Most Important Job Skill of the Future', Fast Company, 14 June 2016, www.fastcompany.com/3060883/why-coding-is-the-job-skill-of-the-future-for-everyone.

14 In their seminal report *The Future of Employment: How Susceptible Are Jobs to Computerisation?*, Carl Benedikt Frey and Michael A. Osborne suggest that even 'the work of software engineers may soon largely be computerisable'. This may be particularly true of certain complex and repetitive trial-and-error tasks. However, there are some human factors, such as creativity and perception, that would be more difficult to automate. Nevertheless, in a survey of 550 software developers conducted by the Evans Data Corp, the most commonly cited concern (29.1 per cent) was that 'I and my development efforts are being replaced by artificial intelligence'. See Carl Benedikt Frey and Michael A. Osborne, *The Future of Employment: How Susceptible Are Jobs to Computerisation?* (Oxford: Oxford Martin School, 2013), www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf; Evans Data Corporation, 'Software Developers Worry They Will Be Replaced by AI', updated 8 March 2016, https://evansdata.com/press/viewRelease.php?pressID=231; Kevin Maney, 'Computer Programming Is a Dying Art', *Newsweek*, 29 May 2014, www.newsweek.com/2014/06/06/computer-programming-dying-art-252618.html.

15 Big Think, 'Why the Time for Diversity in Tech Is Now', Big Think, 9 July 2018, https://bigthink.com/amway/why-the-tech-industry-needs-diversity.

16 Iván Martín et al., *From Refugees to Workers: Mapping Labour-Market Integration Support Measures for Asylum Seekers and Refugees in EU Member States; Volume I: Comparative Analysis and Policy Findings* (Gütersloh, Germany: Bertelsmann Stiftung, 2016), www.bertelsmann-stiftung.de/fileadmin/files/user_upload/Studie_NW_From_Refugees_to_Workers_Vol1.pdf.

Table 1. Refugee coding schools and programmes, as of October 2017

Project	Country	Link
CodeDoor	Germany	http://codedoor.org/
CodeYourFuture	United Kingdom	https://codeyourfuture.co/
Devugees	Germany	www.devugees.org
Frauenloop	Germany	http://frauenloop.org/
HackYourFuture	Netherlands / Denmark	www.hackyourfuture.net/
Integrify	Finland	www.integrify.fi/
New Americans Code	United States	www.newamericanscode.com/
PI515	United States	www.pursuitofinnovation.org/
Powercoders	Switzerland	http://powercoders.org/
Project Integration	Switzerland	http://projectintegration.ch/
RBK (formerly ReBootKamp)	Jordan (U.S. run)	http://rbk.org/
Re:Coded	United States	www.re-coded.com/
ReDI School of Digital Integration	Germany	www.redi-school.org/
Refugee Coding Project	United States	www.refugeecodingproject.com/
Refugees on Rails	Germany	http://refugeesonrails.org/en/
refugees{code}	Austria	www.refugeescode.at/

As is illustrated in Boxes 1 through 3, coding schools for refugees differ widely in their location, size, and funding model. But the most significant difference is between prescriptive and self-led learning. Of the schools based in Germany, Devugees sits at one extreme, providing a structured, full-time, one-year programme. At the other end of the spectrum, CodeDoor expects its students to teach themselves at their own pace and aims to provide all material prerequisites for them to do so. ReDI School sits between the two, offering a range of courses and timelines from which people can pick and choose according to their circumstances and interest.

Coding schools for refugees differ widely in their location, size, and funding model.

Box 1. Devugees: Structured learning along two tracks

Devugees (a portmanteau combining 'developer' and 'refugees') was created by a Berlin-based group of tech professionals, including both programmers and human resource specialists. The idea was hatched in 2015, and the organisation was founded in April 2016. Whereas most coding schools are nonprofits, Devugees operates as a for-profit social enterprise that considers positive social impact as its primary objective.

In devising the project's structure, Devugees took what programme manager Johannes Kleine describes as 'a very German route': it opted to operate from within the system of state-recognised and subsidised vocational training. It succeeded in becoming a certified provider of vocational courses, which allows most students to enrol through and receive financial support from the Job Centre (an institution run jointly by local authorities and the Federal Employment Agency). While this has generated a lot of bureaucratic work for Devugees staff, the reward is considerable: Devugees is unique, not only among German refugee coding schools but among all 112 digital projects for refugee integration reviewed by betterplace lab in 2017, in that it has a fully functioning business model. It fully finances its operations through its core programmes, specifically through government funding.

Devugees offers two different courses. In a four-week introductory course, students learn some basics of software development and participate in a number of 'company tours' during which they talk with developers about their jobs. Those who are sufficiently enthused by the introductory course can enrol in a 12-month course focused specifically on front-end web development, which involves nine months of intensive training followed by a three-month internship. Both the introductory course and the one-year course are full time. Students attend class from 9am to 4pm five days per week (in the one-year course, one of the five days focusses on developing German language skills).

The stated goal is that after completing the one-year course, students will be able to get a job as a junior front-end developer. The first one-year cohort graduated in October 2017, and all seven students in this cohort were offered paid jobs after their internships. As of February 2018, the second cohort of five students were in the middle of their internships. Including both the year-long and the four-week courses, Devugees is currently teaching around 120 refugee students.

Sources: Ben Mason, Lavinia Schwedersky, and Akram Alfawakheeri, *Digital Routes to Integration: How Civic Tech Innovations Are Supporting Refugees in Germany* (Berlin: betterplace lab, 2017), www.betterplace-lab.org/en/digital-routes-to-integration/; author interview with Johannes Kleine, Programme Manager, Devugees, Berlin, July 2017; author interview with Eihab Tinawi, Alumnus, Devugees, Berlin, September 2017.

Box 2. ReDI School of Digital Integration: Flexible courses for different skill levels

The ReDI School of Digital Integration started life as Refugees on Rails—a play on the programming language Ruby on Rails—in 2015. It was cofounded by Anne Kjær Riechert and two others. In February 2016, Refugees on Rails split to become two separate projects, one of which is the Berlin-based ReDI School.

ReDI offers courses on a wide range of topics and caters to various ability levels, including complete beginners. Courses typically involve two hours of in-class instruction per week plus homework projects for a four-month semester.

The ReDI School has captured public attention like few other digital projects for refugees. Many media outlets have reported on the project, helped along by visits from well-known figures such as Chancellor Angela Merkel and Facebook founder Mark Zuckerberg. Financing for ReDI has come mostly from private companies, largely but not exclusively in the technology sector, including Facebook, Cisco, and Klöckner & Co.

As of February 2018, ReDI had approximately 270 students, and more than 350 alumni had completed at least one course. Over time, ReDI courses are expanding and becoming more structured. Originally operating only in Berlin, it now offers courses in Munich and plans to expand further. ReDI has also launched programmes specifically for women and children. Starting with a hodge-podge of stand-alone courses, it is gradually reshaping the curriculum into streams, where courses more explicitly build on one another and cater to different ability levels.

Sources: Mason, Schwedersky, and Alfawakheeri, Digital Routes to Integration; author interview with Akram Alfawakheeri, Project Manager, Bmsoft, Berlin, August 2017; author interview with Sven Hermann, Interim Programme Director, ReDI School, Berlin, August 2017; author interview with Manuel Laudam, Teacher and Web Developer, ReDI School, Berlin, July 2017; author interview with Anne Kjær Riechert, Co-founder, ReDI School, Berlin, July 2017.

Box 3. CodeDoor: Supporting self-guided learning

CodeDoor was founded in early 2015, before the launch of the bulk of refugee-focused digital projects later that year. One reason for this foresight was that the founders come from the city of Gießen, which at the time was the first point of arrival and registration for many refugees. They saw signs of the coming crisis early on.

The project started as a drive to donate used laptops to refugees. The team soon noticed, according to programme manager Farid Bidarel, that this was of limited value, beyond offering a way to maintain contact with relatives over Skype. Over time, the idea developed into giving refugees the opportunity to learn to code.

The philosophy at CodeDoor is clear: not merely to *teach* refugees but to *enable them to learn.* CodeDoor differs from Devugees and the ReDI School in that the learning model is not primarily based on classroom teaching. Instead, staff help students teach themselves, at their own pace, using online courses created by big-name providers such as Udacity. CodeDoor provides non-financial support in the form of laptops and free access to course content that would otherwise come at a price.

In addition to the online courses, there are also on-the-ground operations, provided by CodeDoor staff and volunteers along with local partner organisations. These partners vary from city to city but include the digital companies SalesForce, Cisco, and Intel, as well as Social Impact Lab. The partners determine to some extent which courses are offered, who the target groups are, and how much offline tutoring is offered. The partners also support CodeDoor operations financially.

By February 2018, more than 400 students had participated in CodeDoor programmes, and according to data gathered by the organisation, 90 per cent of graduates had found a job. Some of the local chapters have broadened their focus beyond refugees to offer scholarships to members of other underserved groups who would like to learn to code but might otherwise be unable to, such as unemployed people.

Sources: Author interview with Farid Bidardel, Programme Manager, CodeDoor Berlin, August 2017.

B. The profile of a software developer

Although on paper, the job of a software developer may appear to be a good fit for tech-savvy refugees, the German labour market is notorious for its subtle and deep-rooted cultural norms—from attitudes to hierarchy and bluntness of feedback, to certain modes of formal, high-register professional communication—which newcomers can find difficult to navigate. Digging deeper into the skills, characteristics, and social practices of software developers suggests that the role is in some ways more open to 'outsiders' than other occupations, while other elements remain subject to the general practices and norms of the German labour market.

Some of this variation depends on nature and context of certain positions. 'Software developer'—or, more colloquially, 'coder'—is a label that spans a wide range of jobs. These vary in responsibilities and level of

seniority, but are united by a particular task and skill set, namely the ability to programme software. Software developer positions account for approximately 25,000 of the 55,000 IT jobs unfilled in Germany.[17]

These jobs can be further divided into three rough groups by type of employer: tech start-ups; larger tech companies and consultancies; and IT jobs within companies not in the tech sector. The third category is the largest and the hardest to describe in any level of detail because the job of software developers largely depends on the activities of the company that employs them. For example, one software developer interviewed for this report works for a company that buys and sells steel, and the team of developers he works with builds software to help the company do this.[18]

The type of organisation, as a result, determines the skill set refugee coders and any other potential employees need to possess. This includes the extent to which the job profile requires someone with a particular level of language proficiency, traditional degree qualifications, professional or industry certifications, cultural competencies, soft skills, or theoretical knowledge.

1. Language proficiency

Most developers need a certain level of English proficiency, both because the major programming languages are based on English and because many teams of developers in Germany use English as their working language. For example, an interviewee described it as 'absolutely possible' to work at Zalando, an online retailer, with no knowledge of German—and many do.[19] The staff in Zalando's Berlin office speak more than one hundred languages, but English is the lingua franca and the ability to communicate in it is a prerequisite for working at the company.[20]

All of the tech professionals interviewed agreed that the language barrier is lower for IT jobs than those in other fields.

Many refugees in Germany would be able to meet this requirement. While no data are available about the second and third language abilities of refugees in Germany, there is anecdotal evidence that proficiency in English is common among young and highly educated Syrians in particular. Moreover, most IT employees in Germany speak English as a foreign language. As one interviewee observed, this results in a particularly international kind of English being spoken, with a lot of understanding and leeway when people are less than fully fluent.[21]

All of the tech professionals interviewed agreed that the language barrier is lower for IT jobs than those in other fields. One web developer, however, added the caveat that this may depend on the make-up of the office.[22] The small team of developers at the start-up where he works are all Germans, and they speak German with one another. At one point, they took on two developers who could not speak German, and the whole team switched to English. Although not a monumental shift, this did cause some friction: some veteran staff

17 Author analysis of Bitkom data. Though Bitkom did not itself put a number on this, it is possible to make the calculation based on the vacant IT jobs in both the IT sector and other sectors (23,500 and 31,500 respectively), as well as the proportion of these that are software developer positions (63 per cent and 30 per cent respectively). See Berg, *Der Arbeitsmarkt für IT-Fachkräfte*.
18 Author interview with Rami Rihawi, Alumnus, ReDI School, and Junior Developer, Kloeckner, Berlin, August 2017.
19 Ibid.
20 Ibid; author review of online job postings in Zalando's Berlin office. See Zalando, 'Start Your Zalando Journey Here', accessed 19 March 2018, https://jobs.zalando.com/en/?location=Berlin&search=.
21 Author interview with Thomas Schindler, Founder, Delodi, Berlin, August 2017.
22 Author interview with Johannes Opper, Web Developer, betterplace.org, Berlin, September 2017.

were frustrated at their suddenly reduced ability to communicate their ideas, and the new recruits were left out when their co-workers sometimes slipped back into German. Reflecting on the experience, this developer would advise anybody not fluent in German, refugee or otherwise, to think twice about joining a team that would otherwise be communicating in German.

2. Degree requirements

The question at the heart of refugee coding schools is whether it is possible—and maybe even more expedient—to enter the IT job market without studying computer science (or a related subject) at the university level. As well as demanding a tremendous investment of time, bureaucratic and linguistic barriers can make higher education a tricky pathway to navigate for many newcomers.

With some caveats, interviewees who work in the tech sector said that having a university degree is not essential and is far from the most important criterion used to assess candidates for a position. This is also borne out by evidence on coding boot camps in the United States, where the placement rate for students after completing these accelerated computer science programmes is 80 per cent.[23] This suggests that these institutions grant their students sufficient credentials to find employment, and this is not severely undermined by the absence of official degree accreditation.

The overall picture was clear: a university degree is by no means a prerequisite or the only path to a successful career as a developer.

A programme manager from a coding school went further by arguing that what people learn from a university computer science course is not always what employers are looking for: 'you learn the theory but you don't learn how to actually code'.[24] The experiences of a Syrian refugee who completed three years of a five-year IT engineering degree at Damascus University before having to flee the country support this argument. Although he described having learnt a lot about the logic behind computer systems, the history of computing, network theory, and other topics, he was not taught to write code. What coding ability he has, he has mostly taught himself since leaving Syria.[25]

Still, a coding teacher at ReDI School argued that a university degree was more than a useless piece of paper. Although it may not be the most important factor, it can give applicants an added advantage in the hiring process. For example, if two candidates have otherwise identical profiles, the instructor predicted, the one with a degree would likely get the job.[26] But the overall picture was clear: a university degree is by no means a prerequisite or the only path to a successful career as a developer. This arguably sets software development apart from most other high-skilled, highly paid professions.

23 A report by the Council on Integrity Results Reporting (CIRR) found that boot camps had a 92 per cent graduation rate; alumni had a 80 per cent placement rate and could expect a starting salary of more than USD 70,000. See Sri Ravipati, 'Report: 92 Percent of Coding Bootcamp Students Graduate on Time', Campus Technology, 10 April 2017, https://campustechnology.com/articles/2017/04/10/report-92-percent-of-coding-bootcamp-students-graduate-ontime.aspx; CIRR, 'January–June 2017 Graduate Outcomes', accessed 22 March 2018, https://cirr.org/data.

24 Author interview with Farid Bidardel, Programme Manager, CodeDoor, Berlin, August 2017.

25 Author interview with Akram Alfawakheeri, Project Manager, Bmsoft, Berlin, August 2017.

26 Author interview with Manuel Laudam, Teacher and Web Developer, ReDI School, Berlin, July 2017.

3. Industry qualifications

One way to demonstrate IT expertise is by earning industry-standard qualifications. These are courses designed and awarded by large technology companies including Microsoft, Cisco, and others. The courses are typically short, with a narrow focus on a particular technology, and are targeted to people who are already employed and wish to gain or consolidate specific technical expertise. Perhaps unsurprisingly, the content of these courses more closely reflects the technologies currently being used in the IT sector than do university curricula. Hence, what people learn by taking these courses can often be more directly applied in a professional setting.

The certificates awarded for completion of industry-standard courses, backed as they are by well-respected technology brands, are generally well regarded. One interviewee suggested that these certificates, gained by studying at a coding school, would be more valuable to him than the coding school's own certificate, which might have more limited recognition among employers.[27]

Despite the value of these qualifications in the job market, only some coding schools, such as CodeDoor (see Box 3), have tailored their courses to this type of content. Others, such as ReDI (see Box 2), support a mix of in-house and external accreditations, including Cisco's Internet of Things qualification.

4. Interpersonal and intercultural skills

While developers are often cast as loners, whose extraordinary technical ability is paired with dismal social skills, a number of interviewees rejected this stereotype. On the contrary, they argued, since coders spend most of their time working intensively in teams, the ability to communicate and collaborate well with colleagues is crucial.

For refugees, this opens the door to the cultural and linguistic misunderstandings common to the migrant experience everywhere. Several interviewed refugees offered bemused anecdotes about differences they had noticed in German workplaces. Meanwhile, several German interviewees outlined possible obstacles to employment or advancement. A coding-school programme director (and previous teacher and web developer) described having to regularly discuss the topic of punctuality with his students,[28] explaining that, true to stereotype, it is very important to Germans and that consistent lateness could damage their prospects in a German professional setting. Another founder of a tech organisation spoke of IT projects in which developers in different countries were collaborating to build something and how they had very different ideas of when to consider it complete.[29] Several ReDI students, meanwhile, described their difficulties in understanding the expectations German companies had for prospective employees.[30]

While differences between cultural values and norms may not be frequently or easily discussed in workplaces, it may become increasingly important to do so in diversifying industries. There is a fine line between acknowledging these dynamics (with an eye toward furthering the professional success of immigrants) and

27 Author interview with Farid Bidardel.
28 Author interview with Sven Hermann, Interim Programme Director, ReDI, Berlin, August 2017.
29 Author interview with Thomas Schindler.
30 These comments were made during a March 2017 workshop that included students and team leaders from a large German company. One topic was what actions might facilitate or impede getting refugees into jobs (not necessarily in technology). One participant, a middle-aged Syrian man, described how it had taken him many months of being in a job before he appreciated some of the softer expectations his employer had of him. In particular, he said, German companies expect employees to be engaged on a personal level and become a part of the 'spirit' of the team. This was totally alien to his professional experience in Syria, where he said it was sufficient to simply fulfil one's duties to a high standard. Participant comments during the workshop 'New Work' offered by betterplace lab to a private sector client, Berlin, March 2017.

stigmatising minorities or creating a self-fulfilling prophecy, in which the majority population quietly expects migrant employees to behave a certain way—and then penalises those who do not.

5. Transferable soft skills and the ability to keep learning

Software development—and especially certain subfields, such as front-end web development—are both inexhaustibly large and extremely fast-moving. This means that training as a developer is not the same as learning a traditional profession or craft, in which a trainee gradually masters a stable body of received knowledge or skills. Even very experienced developers expect to be regularly confronted with problems they do not know how to solve and forced to look things up and experiment. Moreover, there is an expectation that professionals of all levels continuously learn simply to stay abreast of the rapidly changing technology.

This has crucial implications for the skills budding developers needs to cultivate. Interviewees were adamant that specific pieces of knowledge—for example, how to build software in a particular programming language—are far less important than more general, higher-order abilities and skills such as humility, adaptability, and curiosity when presented with something new. One interviewee said that having a genuine passion and love for coding is key to staying motivated and keeping on top of new developments in the field.[31]

Teaching somebody a specific coding language or task is of limited value if that person is unable to build on and expand this knowledge.

Employers hiring developers are typically far more interested in these transferable skills than in a candidate's full mastery of particular technologies relevant to the vacant role (which is merely a bonus). For instance, a tech start-up founder who graduated from the well-regarded Maker's Academy coding school in London says many of her classmates were hired into positions where they would be using a totally unfamiliar software language.[32] Another interviewee argued that for an experienced coder with a sound understanding of problem-solving, the programming language is quite immaterial; it takes only a matter of days to adapt to the new vocabulary.[33]

By the same token, teaching somebody a specific coding language or task is of limited value if that person is unable to build on and expand this knowledge. Even in the unlikely situation that students find jobs that precisely match what they have learned to do, sooner or later the company and its technology will move on.

6. Theoretical knowledge

The decisive difference between a 'true' coder who is able to adapt to new challenges and somebody who has learnt some coding tasks, according to interviewees, is whether they have a theoretical understanding of what underpins the technology. One developer describes it as the difference between being able to use a tool and really understanding how the tool works.[34] Another warned of significant risks if theory is left out of coding-school curricula. In his words, 'maybe students are taught to use database software A because it is currently in vogue, but then companies all switch to new software B, and anybody who was working with the old software

31 Author interview with Thomas Schindler.
32 Author interview with Lilian Breidenbach, Co-Founder, Legal OS, Berlin, September 2017.
33 Author interview with Akram Alfawakheeri.
34 Ibid.

without understanding the theory behind what they were doing would be completely lost'.[35] This casts a new light on the comparisons other interviewees made between university study as more heavily focussed on the theory of computer science, versus coding schools as more centred on practical training. While a university degree in itself may not be decisive in accessing developer jobs, it might offer some people a surer path to this theoretical understanding, which is critical to long-term employability.[36]

As described in the previous section, a coder's most important skill is arguably the right mindset: a hunger to keep learning and solving new problems. In turn, this constant learning process requires a certain theoretical understanding of what underpins the practice of coding. A key element of success is therefore teaching people to teach themselves—that is, equipping them to continue to learn and develop in a self-directed way after they have finished the coding course.

This could be seen as an argument in favour of self-directed learning rather than a rigidly prescribed curriculum. In such a model, the coding school would create a supportive learning environment and guide students towards the most important subject matter—but much of the actual learning would be autodidactic. While this is demanding and may not suit all students, it mirrors and reinforces many of the skills that are key to becoming a developer, including motivation and self-discipline.

III. THE INTEGRATION POTENTIAL OF REFUGEE TECH SCHOOLS

At first glance, software development appears to be a profession with high rewards and fewer barriers to entry for refugees. However, closer examination of the profile of a successful software developer suggests the ultimate utility of coding schools as a path to integration for large numbers of refugees may be more limited. In particular, the IT sector's emphasis on continuous and self-directed learning may put a career in software development out of reach for refugees who lack crucial soft skills and are not supported in developing them.

One criticism of the refugee coding school movement is that it primarily serves newcomers who are already well educated and relatively highly skilled. The question is whether coding schools can reach beyond this narrow group to support the labour-market and social integration of a more diverse pool of refugees.

A. Can software-development jobs offer opportunities on a large scale?

One interviewee argued that instead of aiming to churn out large cohorts of refugee developers, coding schools would create more value by identifying the small number of candidates with the greatest potential and focusing time and resources on them.[37] But this too is a tradeoff: by concentrating on fostering the economic and cultural capital of a small portion of the refugee population, such an approach may reinforce existing inequalities within the refugee community, especially around educational privilege and digital literacy. A

35 Author interview with Sven Hermann.

36 This conclusion was suggested by Asem Hasna, a refugee from Syria. He completed various applied courses at the ReDI School and elsewhere, and followed these up with an internship at Cisco. He concluded that the best way to further his career as a developer is by going to university. Author interview with Asem Hasna, Alumnus, ReDI School, and Intern, Cisco, Berlin, August 2017.

37 Author interview with Thomas Schindler.

trade association's guidelines for employing refugees states: 'Even though the overwhelming majority of the refugees may lack the desired educational background … meaning that currently probably only a very low percentage is fundamentally suitable for a career in IT, nonetheless on account of the very high number of newcomers, we can still expect that a considerable number of them will be of great interest for this labour market'.[38] Yet interest does not necessarily equate to employment.

On the other hand, software development is an especially open field for people from a variety of backgrounds and education levels. For instance, one interviewee observed that few would-be developers are barred from participating in coding courses on the basis of their initial ability.[39] Those who are motivated to learn can find the opportunity to do so without having to first pass exclusionary entrance or language examinations.

It is impossible to predict what proportion of the refugee population could realistically aspire to become a software developer. But even if coding is a realistic career path for only a small and elite minority, the potential positive impact of software development training programmes for this group is tremendous. And this, too, could have spill-over benefits for the broader refugee community: the high incomes of software developers could help to make wider familial and social networks more prosperous. Their career success may also make them role models for others and foster a more positive perception of refugees among the host community.

B. Good practices in expanding opportunities

This review of existing coding schools suggests some promising practices that can help make coding schools more accessible. Key among them is providing would-be participants with the information they need to judge for themselves whether a programme and career in this field is right for them.

All the students and alumni interviewed emphasised the value of the social and professional networks the coding schools opened up for them.

This 'filtering function' is an explicit part of Devugees's four-week introductory course, and it is inherently built into more flexible approaches such as the one employed by the ReDI School, where people may begin by signing up to just one or two courses. This is a valuable first step that can ease some people onto their future career path, and these lower stakes can also be helpful for those who wish to try coding but ultimately change their minds. Thus, a certain drop-out rate is to be expected from coding schools, especially early on, and should not be viewed as a sign of failure either on the part of the school or the students.

Another way to broaden the range of refugees who may find value in such programmes is to include a focus on building up their networks and institutional knowledge. All the students and alumni interviewed emphasised the value of the social and professional networks the coding schools opened up for them. Among other benefits, these connections helped them to better understand the industry they were trying to enter. Of the three German schools discussed here, Devugees goes furthest in this regard, with its company tours and 'buddy programme', which links each student to a mentor who is a professional software developer. In

38 Author translation of the passage: 'Auch wenn der überwiegenden Mehrheit der Flüchtlinge die gewünschte Vorbildung und Affinität zur IT-Branche nach dem derzeitigen Kenntnisstand fehlen dürfte und somit voraussichtlich nur ein sehr kleiner prozentualer Anteil eine Grundeignung für einen IT-Beruf mitbringt, so ist aber zu erwarten, dass auf Grund der sehr hohen Zahl der Neuankömmlinge trotzdem eine beträchtliche Zahl von ihnen für diesen Arbeitsmarkt von großem Interesse ist'. See VOI, *Leitfaden für die Beschäftigung von geflüchteten Menschen in der IT-Branche*.

39 Author interview with Johannes Opper.

combination, these programme features help students gain a better sense of the landscape of potential employers and establish their own professional networks.[40]

CodeDoor and ReDI achieve something similar through the relationships between students and teachers (most of whom are professional developers volunteering their time) and events where representatives of potential employers meet students.[41] Having exposure to the everyday work of different IT companies also lets students learn about the practices and processes commonly used in developer teams (such as 'Scrum development teams'[42]), as well as the working culture and atmosphere of, for example, a tech start-up. Understanding these is an asset when applying for jobs.

C. Coding schools as an on-ramp to other career pathways

Coding ability can be an asset even for people who do not go on to hold developer jobs.[43] Since the IT sector is likely to keep growing, even a cursory familiarity with basic coding principles will be helpful in accessing an increasing number of jobs, not only in software development. Also, the learning process common to coding schools can impart valuable and transferable soft skills. For example, a programme manager at a coding school noted that the skills required to code, such as logical thinking and problem-solving, are assets for many job applicants, even those pursuing jobs that have nothing to do with coding.[44]

The digitisation of almost every part of the economy means that a large and increasing proportion of jobs require some level of digital proficiency. Many professionals work with specialist software—designers with Photoshop and engineers with Solid Edge, for example. And almost any desk job requires proficiency in basic tools such as Microsoft Office, email, and web browsing. Yet large numbers of refugees lack even this level of digital literacy.[45] Expanding coding-school offerings to provide lower-level training in digital skills could thus give a wider range of refugees—particularly those who are older, poorer, or have more limited education—access to both a greater range of employment opportunities and important channels of community participation.

40 Eihab Tinawi, despite having 16 years' experience working in the related field of telecommunications in Syria, credits the Devugees network for his internship at a German IT company, secured at the end of nine months of study at Devugees. Author interview with Eihab Tinawi, Alumnus, Devugees, Berlin, September 2017.

41 The three ReDI alumni interviewed—Rami Rihawi, an employee at Klockner, and Asem Hasna and Ahmadullah Sediqi, both interns at Cisco—secured these positions thanks to an initial connection made at ReDI. Author interviews with Rami Rihawi; author interview with Asem Hasna; author interview with Ahmadullah Sediqi, alumnus, ReDI School, Berlin, July 2017.

42 Scrum development teams are self-organising, cross-functional, and non-hierarchical. These teams are meant to include a variety of specialised skills and areas of focus, as required to complete a given task. See Scrum.org, 'What Is a Scrum Development Team?', accessed 19 March 2018, www.scrum.org/resources/what-is-a-scrum-development-team.

43 For instance, after attending a three-month coding academy, Lilian Breidenbach co-founded a tech start-up. Although she does not do any actual coding herself, she explains that her ability to understand what is happening on the level of code, and what is and isn't technically possible, is critical in order to be taken seriously by potential investors. Akram Alfawakheeri, in his role as project manager at an IT company, similarly benefits from an ability to understand what his developer colleagues are doing. And Viviane Engels at Zalando agreed that some level of coding literacy is desirable for non-developer roles like project manager. Author interview with Lilian Breidenbach; author interview with Akram Alfawakheeri; author interview with Viviane Engels, Corporate Responsibility Manager, Zalando SE, Berlin, September 2017.

44 Author interview with Farid Bidardel,

45 Ben Mason and Dennis Buchmann, *ICT4Refugees: A Report on the Emerging Landscape of Digital Responses to the Refugee Crisis* (Bonn: Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH, 2016), www.betterplace-lab.org/wp-content/uploads/ICT4Refugees-Report.pdf.

D. Psychological and social benefits

Beyond improved employment outcomes, participation in a coding school can offer considerable and immediate psychological benefits for refugees. This is an area where the ReDI School excels. Every interviewee connected with ReDI commented on the strong, supportive, and warm community that has emerged around the organisation.[46] Its office has become a community space where people not only attend courses, but also where students and alumni gather in their free time to work on projects and collaborate. The value of such a welcoming social space for people who have been dislocated from their homes and social networks, and in many cases suffered trauma of various degrees, should not be underestimated.

Attending coding courses can also provide structure and focus in the potentially confusing and uncertain first months after a refugee has arrived in Germany. Many students at ReDI took courses while their asylum applications were being processed and they were forbidden to seek paid work or enrol at university.[47] Coding schools can therefore jumpstart newcomers' social and labour-market integration, while making efficient use of the waiting period after arrival.

IV. POLICY IMPLICATIONS: HIGH INVESTMENT, HIGH REWARDS

Training refugees as software developers could have substantial pay-offs both for refugees and their host communities—particularly in countries struggling to meet demand for trained and able coders, as in Germany. The IT sector is unique among high-skilled professions in assessing potential recruits in terms of competence and talent, rather than formal qualifications. Many of the most sought-after characteristics have less to do with specific knowledge and expertise, and more to do with transferable and soft skills—in particular the ability to keep learning independently. For coding schools, this suggests time and resources may be best spent by focussing on developing and reinforcing these soft skills, and on teaching specific technologies as a means to achieve this goal rather than as an end in itself.

However, because software development requires higher-order thinking and the ability to self-motivate, it will not be a good fit for all. There are limits to the benefits of coding schools for refugee integration. Moreover, it is clear that even when somebody is well suited, a considerable investment of time and resources is required before they are employable. Refugee coding schools are therefore a high-investment policy lever, with potentially narrow direct benefits.

These limitations can be viewed within the context of broader fundamental changes to the labour markets of developed economies. In-depth treatment of these shifts is beyond the scope of this report, but in brief, analysts point to a 'hollowing out' of medium-skilled jobs.[48] Future labour markets will, they forecast, be comprised of two tiers: a small number of elite jobs, which demand high levels not only of technical knowledge and cognitive skills, but also of soft skills and social capital, and a much larger number of low-skilled and low-paid positions. Training a workforce for the elite jobs requires high investments regardless of back-

46 Author interview with Akram Alfawakheeri; author interview with Asem Hasna; author interview with Sven Hermann; author interview with Manuel Laudam; author interview with Rami Rihawi; author interview with Ahmadullah Sediqi; author interview with Anne Kjær Riechert, Co-Founder, ReDI School, Berlin, July 2017.

47 Author interview with Anne Kjær Riechert.

48 Another report in this series offers a more in-depth analysis of changes in European labour markets and what they mean for immigrant and refugee integration. See Meghan Benton and Liam Patuzzi, *Jobs in 2028: How Will Changing Labour Markets Affect Immigrant Integration in Europe?* (Brussels: Migration Policy Institute Europe, 2018), www.migrationpolicy.org/research/jobs-2028-changing-labour-markets-immigrant-integration-europe.

ground. However, if refugees and migrants face disproportionate barriers to accessing the training that would allow them to enter these elite circles, it could have significant and potentially negative intergenerational repercussions in terms of social mobility and integration.

On an immediate level, policymakers could adopt the following strategies to help unlock the potential of refugee coding schools:

1. ***Improve the flexibility of certification.*** Efforts to fund software development training should be guided by an awareness of how the tech industry works. Currently, in Germany, a range of bureaucratic barriers hinder coding schools' efforts to recruit well-qualified teachers of various nationalities.[49] Moreover, all course materials—including even minor alterations to the curriculum—must be approved by the certification agency, a cumbersome process that makes it difficult to keep up with the fast-moving technology industry. Relaxing these strict conditions could help schools keep their courses up to date and focus limited resources on programming rather than administrative matters. Certification should be granted on the level of the course, not the individual lesson, and it should focus on the level of proficiency to be attained and less on specific technologies.
1. ***Combine coding classes with compulsory language training as an 'exit route'.*** All refugees in Germany are required to attend German language classes. But this may unnecessarily delay critical skills training and planning for how to enter the labour market, particularly for those likely to find employment in workplaces where proficiency in German is not mandatory. Policymakers should consider whether signing up to a coding school could be done in parallel with language classes, or whether the language-course requirement could be waived or adjusted for those pursuing a career in an English-dominated field.

Ultimately, although the required investment is high, so too are the potential rewards. Coding schools for refugees can streamline access to a highly skilled and sought-after profession and relieve critical labour shortages, all while improving the social mobility and integration of newcomers who might otherwise face massive barriers. Even if only a minority of the refugees who complete some amount of coursework at a coding school end up working as software developers, being exposed to basic digital skills can improve employability in a broad (and likely expanding) range of industries. Such schools can also have positive spill-over effects for the broader refugee community, such as raising incomes that benefit entire families and social networks, and, possibly, helping refugees gain the respect of host communities. Moreover, coding schools that give newcomers the opportunity to build social networks and sharpen transferable soft skills, such as critical thinking, self-guided learning, and teamwork, can provide a much-needed leg up in the labour market—a significant return on investment whether they choose to code for a living or not.

Coding schools for refugees can streamline access to a highly skilled and sought-after profession and relieve critical labour shortages.

49 For instance, Devugees, the only tech school that has succeeded in becoming a state-certified provider of vocational training, only maintains this status through its vast efforts to fulfil certification requirements. Every teacher at Devugees is required first to take a test. The test is in German, despite the fact that all courses are taught in English. This constitutes a significant barrier for otherwise well-qualified teachers of various nationalities.

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Ben Mason joined betterplace lab, a Berlin-based nonprofit think tank, in 2013 and since February 2016, he has been leading the lab's work on digital technology and its benefits for refugees and other migrants. betterplace lab, more broadly, works at the intersection of digital innovation and civil society through a mix of research and other programmes, such as capacity building for nongovernmental organisations and administering innovation funds.

Along with Lavinia Schwedersky and Akram Alfawakheeri, Mr. Mason co-authored the report *Digital Routes to Integration: How Civic Tech Innovations Are Supporting Refugees in Germany* (betterplace lab, 2017). Before that, with Dennis Buchmann, he wrote *ICT4Refugees: A Report on the Emerging Landscape of Digital Responses to the Refugee Crisis* (betterplace lab, 2016).

Mr. Mason holds a BA in philosophy and German from Oxford University.

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