

EN

# Developing and matching skills in the online platform economy

Findings on new forms of digital work and learning from Cedefop's CrowdLearn study





Developing and matching skills in the online platform economy

Findings on new forms of digital work and learning from Cedefop's CrowdLearn study Please cite this publication as: Cedefop (2020). *Developing and matching skills in the online platform economy: findings on new forms of digital work and learning from Cedefop's CrowdLearn study*. Luxembourg: Publications Office. Cedefop reference series; No 116. http://data.europa.eu/doi/10.2801/588297

A great deal of additional information on the European Union is available on the Internet.

It can be accessed through the Europa server (http://europa.eu).

Luxembourg: Publications Office of the European Union, 2020

#### © Cedefop, 2020

Except otherwise noted, the reuse of this document is authorised under a Creative Commons Attribution 4.0 International (CC BY 4.0) licence (https://creativecommons.org/licenses/by/4.0/). This means that reuse is allowed provided appropriate credit is given and any changes made are indicated. For any use or reproduction of photos or other material that is not owned by Cedefop, permission must be sought directly from the copyright holders.

This publication contains UK data and analysis based on research conducted before the United Kingdom's exit from the European Union on 31 January 2020. EU averages or other statistical parameters including the UK reflect the situation in the European Union before 31 January 2020 and should not be considered as representative of the situation in the EU thereafter. In this context `EU-28' refers to the 28 EU Member States prior to 31 January 2020.

#### PRINT

ISBN: 978-92-896-3059-7 ISSN: 1608-7089 doi:10.2801/758653 TI-RF-20-003-EN-C PDF ISBN: 978-92-896-3058-0 ISSN: 2363-216X doi:10.2801/588297 TI-RF-20-003-EN-N

Designed by Missing Element Prague Printed in the European Union

#### The European Centre for the Development of Vocational Training (Cedefop) is the European Union's reference centre for vocational

education and training, skills and qualifications. We provide information, research, analyses and evidence on vocational education and training, skills and qualifications for policy-making in the EU Member States. Cedefop was originally established in 1975 by Council Regulation (EEC) No 337/75. This decision was repealed in 2019 by Regulation (EU) 2019/128 establishing Cedefop as a Union Agency with a renewed mandate.

> Europe 123, 570 01 Thessaloniki (Pylea), GREECE Postal address: Cedefop service post, 570 01 Thermi, GREECE Tel. +30 2310490111, Fax +30 2310490020 Email: info@cedefop.europa.eu www.cedefop.europa.eu

> > Jürgen Siebel, Executive Director Barbara Dorn, Chair of the Management Board

## Foreword

The Covid19 crisis accentuates the vulnerability of platform workers in unprecedented ways. For some higher skilled online platform workers the benefits associated with its flexibility were seen as opportunities in better times; these are now overshadowed by the major risks the crisis poses to the livelihoods of gig workers who engage in them. Social security safety nets and emergency measures can only partly offset the consequences of prolonged economic inactivity. In this new context, actions undertaken so far by governments and social partners to tackle the challenges posed by the platform economy will need to be mainstreamed, with a policy approach which meaningfully integrates regulatory, work-related and learning-related perspectives.

This report is one of the first to examine in depth what type of learning and skills development is done in platform work, shedding light on the experiences of crowdworkers mostly engaging in online freelancing, such as ICT developers, professional translators and graphic designers. In contrast to people in more traditional types of employment, online freelancers already moved to online work and learning long before the Covid19 crisis. With remote work and online learning is becoming much more widespread, there are important lessons to be learned from online gig workers who mastered the art long before others.

Beyond learning style and specific content, one of the main lessons relates to how responsibility for learning is shared and how skills are matched. Challenges linked to algorithmic skills matching, to developing continuing training and learning opportunities in line with emerging skill needs, to recognising informal learning and its portability across different platforms and the standard labour market, to understanding better business recruitment practices and reliance on a gig workforce; these all potentially have wider implications for both the gig and traditional workforce in a post-Covid-19 world.

Insights into what skills gig workers learn and need to be successful in the online gig economy can provide useful directions for how to make vocational education and training more relevant to trends in the future of work. In this perspective, we trust that the findings in this report will stimulate more debate and support the process of setting new policy priorities for VET and skills.

Jürgen Siebel Executive Director Antonio Ranieri Acting Head of Department for Skills and labour market

#### Acknowledgements

This publication was produced by Cedefop, Department for skills and labour market, under the supervision of Alena Zukersteinova and Antonio Ranieri. Konstantinos Pouliakas designed and coordinated the study and edited the report under the *Digitalisation, Al and future of work* project. The publication was peer-reviewed by Cedefop expert Jiri Branka.

The Cedefop CrowdLearn study, on which this report was based, was managed by Cedefop experts Konstantinos Pouliakas and Jiri Branka.

Cedefop wishes to acknowledge the research and services of its contracted consortium, the Oxford Internet Institute and Copenhagen Business School – in particular, Professors Vili Lehdonvirta (Oxford Internet Institute, University of Oxford) and Anoush Margaryan (Department of Digitalisation, Copenhagen Business School), who produced the research report and led all research activities, with the support of colleagues from the Oxford Internet Institute, Laura Larke, Huw Davies, Julian Albert, Siân Brooke and Susanne Klausing.

The authors would like to thank Gretta Corporaal, Alex Wood and Otto Kässi for their contributions to the survey questionnaire and the interview and survey participants for contributing their time and expertise to this study. Special thanks are extended to the online platforms Fiverr, PeoplePer-Hour, Upwork, and Twago for facilitating the qualitative data collection and to the former two platforms additionally for their continued efforts to support the survey distribution.

Cedefop also wishes to acknowledge Annarosa Pesole (Joint Research Centre, Seville), Irene Mandl (Eurofound, Dublin), colleagues at the European Training Foundation (Anastasia Fetsi, Francesca Rosso and Iwona Ganko) and Minna Melleri (Director, EE-HUB), as well as participants at the eighth Cedefop Brussels seminar held on 11 December 2019, for their valuable feedback and suggestions.

The work was carried out under Cedefop's service contract No AO/DSL/KPOUL/PLATFORMSKILLS/012/17

# Contents

Foreword	5
Executive summary	12
1. Introduction	15
2. Findings on skills and skill development in crowdwork	18
2.1. What skills do crowdworkers develop?	18
2.1.1. Skills developed and applied through crowdwork	18
2.1.2. Differences in skill development between types of workers and countr	ies 21
2.2. Ways of learning in crowdwork	27
2.2.1. Workplace learning activities	27
2.2.2. Self-regulated learning strategies	32
3. Findings on how platform markets promote skill development	36
3.1. Stakeholder role in crowdworker skill formation	36
3.1.1. Platform companies' role in skill development	36
3.1.2. Client role in skill development	37
3.1.3. Trade union and self-employed worker associations' role in skill develo	opment 38
3.1.4. The role of policy-makers and government in skill development	39
3.1.5. Learning provider role in skill development	39
3.1.6. Coworking spaces	40
3.2. Case examples of platform support in skill formation	41
3.2.1. Providing information on in-demand skills	41
3.2.2. Recommending training courses	42
3.2.3. Facilitating peer-to-peer learning	42
3.2.4. Providing a training marketplace	45
4. How platform markets match skills supply to demand	47
4.1. Mechanisms for matching skills supply to demand	47
4.1.1. Skills matching advice	47
4.1.2. Tagging, labelling and categorising skills	47
4.1.3. Skill micro-certification based on automated online assessment	47
4.1.4. Automated ranking and endorsement of workers	49
4.1.5. Externally obtained skill certificates on workers' profiles	51
4.2. Managing the entry of new skills into the platform	51
4.3. Effectiveness of skills matching in platform markets	54
5. The challenge of inter-platform skills portability	55
5.1. The case for portability	55
5.2. Challenges in achieving portability	57
5.2.1. The lack of a business case	57
5.2.2. The fluid nature of skills ontologies	57
5.2.3. Technology and data access	58
5.2.4. Data protection regulation	58

6. Conclus	sions and reflections for policy and further research	60
6.1. Platfor	rm work and labour market integration	60
6.1.1.	Overcoming entry barriers for newcomers via 'subsidised micro internships'	
	and 'pre-rating' skills validation in online platform work	60
6.1.2.	Improving information flow to crowdworkers on country-specific procedures	
	related to platform work	61
6.2. Platfor	rm work and initial vocational education and training	62
6.2.1.	Developing self-regulatory learning skills, capabilities and mindsets	62
6.2.2.	Digital skills and competences as priority in initial vocational education	
	and training	63
6.3. Platfor	rm work and continuing professional development	63
6.3.1.	VET provider relevance to 'just-in-time' learning needs	63
6.3.2.	Strengthening trade union support to crowdworkers	63
6.3.3.	Improving feedback loops between clients, platforms and crowdworkers	64
6.4. Platfor	rm work and skills matching	64
6.4.1.	Promoting a portable skills and reputation portfolio and facilitating	
	cross-platform portability	64
6.4.2.	Improving skill tests and integrating external skill test results in platforms	65
6.5. Recon	nmendations for future research	65
6.5.1.	Crowdwork potential and labour market integration for vulnerable groups	65
6.5.2.	Crowdworker self-organisation and networking for learning and skill development	66
6.5.3.	Implications of work and learning practices in crowdwork for learning	
	and teaching in educational settings	66
6.5.4.	Crowdwork platform clients	66
6.5.5.	Understanding the cross-fertilisation of learning and skills across main	
	and other jobs	67
Abbreviati	ons/Acronyms	68
Reference	S	69
Weblinks		72
Methodolo	bgy	73
Skills typo	logy	84
Typology o	of learning activities and strategies	91

### List of boxes, figures and tables

#### **Boxes**

1. Skill development initiatives involving platform economy stakeholders 41

#### **Figures**

#### **Tables**

1. Crowdworker sample demographics: gender (n=74)	74
2. Crowdworker sample demographics: age (n=74)	74
3. Crowdworker sample primary platform (n=77)	74
4. Crowdworker sample demographics: country of residence (n=77)	74
5. Crowdworker sample education (n=74)	75
6. Crowdworker sample employment status (n=69)	75
7. Crowdworker sample primary category of crowdwork (n=77)	75
8. Initial coding scheme for crowdworker interviews	76
9. Types of stakeholder organisations represented in the sample	77

### Executive summary

# The significance of online platform work

A growing number of Europeans are earning some or all of their income from work mediated through digital platforms. This includes so-called 'crowdwork' such as online freelance work, in which workers (typically self-employed, although formal classification of their labour market status is sometimes ambiguous) provide their labour services remotely for clients through online labour platforms, in projects ranging from data entry tasks to specialised software development and creative work.

The Cedefop CrowdLearn research project examined how crowdworkers develop their skills, and how online labour platforms match skills supply with demand, seeking lessons for European skills and education policy. Data collection included interviews with 77 crowdworkers and 25 representatives of stakeholder organisations, such as platform owners, social partner associations, online learning providers, and policymakers. Cedefop also surveyed 1 001 crowdworkers, who were located across six European countries and who worked on four major, international, online freelancing platforms. The main findings and recommendations are as follows.

# Platform work and labour market integration

Platform work is often seen as a tool for labour market integration. Almost a third of the crowdworkers Cedefop surveyed in six European countries reported immigrant background and women reported developing their skills in crowdwork more frequently than did men. However, newcomers to crowdwork reported difficulties in getting started because they lack a record of feedback from previous clients, which is the most important way of signalling skills and trustworthiness in platform work. To address this barrier, policymakers and platforms could collaborate to experiment with subsidised 'micro-internships', in which clients are offered a discounted rate on new and untested crowdworkers in exchange for feedback provision to workers. Alternatively, a 'pre-rating' skills validation system could be fostered through online labour platforms or a neutral third party, giving newcomers a starting point in terms of reputation based on their educational attainment, prior work experience and performance in skills assessment tests.

Platform work is sometimes also proposed as a tool for addressing youth unemployment. However, outcomes show that successful crowdworkers were typically highly educated and possessed significant work experience in the traditional labour market prior to entering crowdwork. Any crowdwork-based interventions to tackle youth unemployment may, therefore, lack potency in the absence of opportunities to accumulate platform work experience and to build an acknowledged portfolio of completed gigs or projects. The CrowdLearn data also reveal that a prerequisite for success in crowdwork is the possession of strong existing digital skills and core/technical skills, as well as communication and organisational skills. To facilitate the take-up of online platform work by younger workers, it is therefore necessary for initial education and training systems to invest significantly in improving young people's digital literacy, their core/ technical expertise and their interpersonal skills. Young people should also be educated about the risks and opportunities that online freelancing work entails.

# Platform work and initial vocational education and training

Successful crowdworkers need a range of skills and personal dispositions developed through formal education and training prior to commencing a working life in the platform economy. Cedefop's CrowdLearn study reveals that self-regulatory learning skills are a fundamental skillset in crowdwork, as they are increasingly found in all 21st-century jobs. They include the ability to understand and identify changing skill requirements; to be proactive in seeking feedback; and to be self-reflective and capable of changing one's learning strategies when they are not working. Such skills are best developed from early childhood and before entering working life. Therefore, a key recommendation of this research is that both initial and continuing vocational education and training should focus on developing peoples' self-regulatory learning skills, capabilities and mindsets.

Although successful crowdworkers continue to learn new skills via continuous learning, they tend to experience less frequent skill development in their digital skills, which are mostly developed before entry into platform work. In countries where online platform work is less common, stakeholder interviewees in this study argued that, in addition to economic and labour market factors, this was partly due to a lack of digital skills in the workforce. Continued focus and investment in digital skills as a key competence in vocational education and training systems is necessary.

# Platform work and continuing professional development

People who have successfully entered crowdwork find that continuous skills development is an essential feature of their experience. Two thirds of the crowdworkers surveyed reported developing their professional skills and technical skills on at least a weekly basis whilst crowdworking. In online freelancing platforms, as in all workplaces, learning needs are closely intertwined with performance goals and driven by clients' needs and requirements. Training courses offered by conventional learning providers as well as massive open online courses (MOOCs) tend to be too long and broad for crowdworkers and cover too many introductory-level skills. To meet such learning needs, adult learning providers could develop short, focused, 'just-in-time' online learning resources to support platform workers' professional development. Crowdworkers are willing to invest time and money in developing skills which immediately help them solve problems in their current work or expand the range of new work they can bid for on the platforms.

The role of social partners in fostering such continuing education and training is key. Trade unions could draw on their existing resources and partnerships to extend training opportunities to online freelancers. Platform companies should support crowdworkers' continuous skill development by guiding clients to give developmental and formative, rather than only summative, feedback to their workers.

# Platform work and skills matching

A key value proposition of online labour platforms is matching skilled workers with clients in need of their skills. However, the matching mechanisms, such as reputation feedback from previous clients, are specific to each platform. More than half of crowdworkers surveyed believed that they could not switch to another platform without negatively impacting their income. This limits worker mobility between crowdwork platforms and potentially also from crowdwork to traditional employment, possibly resulting in skills underutilisation. To address this, platforms could consider providing a portable portfolio function that allows workers to display, advertise, and transfer all their qualifications, skills, and experiences across contexts.

However, achieving such portability involves significant challenges for standardisation efforts, including perceived lack of a business case for leading platforms, the constantly evolving nature of skills matching systems, and data protection regulation. Policymakers should consider engaging with major platform companies to create a policy task force that examines ways of potentially overcoming these obstacles. Platforms could also provide more stringent skill tests and/ or develop ways to validate external skill test results to improve workers' ability to signal and, subsequently, better match their skills.

### CHAPTER 1. Introduction

A growing number of people are earning some or all of their income from work mediated through digital platforms, in what is variously known as platform-based work, crowdwork, and gig work, among other names. Emerging research suggests that such work is a new and increasingly important non-standard form of employment around the world, including in Europe. According to data from the Joint Research Centre's (JRC) second COLEEM survey, platform-mediated work is slowly rising over time and is now the main source of income for about 1.4% of adults across 16 EU member states; this increases to 11% for all individuals who have ever provided labour services in platforms (Pesole et al., 2018; Urzì Brancati et al., 2019). Other surveys also suggest that up to 11% of adults in some European countries are earning some income through such platforms (Huws et al., 2016). Platform work also exemplifies technology-related shifts that are taking place in parts of the broader labour market. These include the substitution of customer feedback for line management; the use of data and algorithms in the screening, monitoring, rewarding, and sanctioning of workers; the growth of contingent work arrangements and self-employment in some countries and sectors; and the use of telework, telecommuting, and virtual teamwork practices.

There is much heterogeneity in platform-mediated work, with Eurofound (2018) identifying at least 10 common main types of platform work. Much attention has been given in the literature to location client- or platform-determined gig work, such as food delivery, transport, and manual labour, due to the potentially adverse consequences on workers' pay, working conditions and social security. Significantly less attention has been given on location-independent online work, also referred to as remote gig or project-based work or crowdwork (1), which includes software development, graphic design, data entry, and almost any other work that can be delivered remotely over the Internet. According to the Online labour index, an experimental economic indicator that tracks project openings posted on leading crowdwork platforms, European employers increased their use of such platforms by approximately 70% from mid-2016 to early 2019 (Kässi and Lehdonvirta, 2018). Some of this increase can probably be attributed to supply-side factors, such as workers seeking flexibility and new income sources. Much of it can also be attributed to demand-side factors, such as firms seeking to use online labour platforms to achieve cost savings, flexibility and access to specialised skills (Corporaal and Lehdonvirta, 2017). Online labour platforms allow small- and medium-sized enterprises (SMEs) to access labour and skills beyond their local labour markets, which could help them grow further.

The types of work transacted on crowdwork platforms represent a wide spectrum of digitally enabled skills, from advanced data analytics and software development to data entry and data labelling tasks (Kässi and Lehdonvirta, 2018). However, as a context for skills development and the matching of skill supply to demand, crowdwork differs radically from standard employment. First, standard employees can expect their employers to provide them with training as new technologies enter the workplace, helping to keep the European workforce's skills up to date. In contrast, crowdworkers appear to be responsible for their own learning and skill development (Margaryan, 2019a, 2019b), and it is not clear how they deal with this responsibility. Is skill development sidelined, or are workers

<sup>(1)</sup> In this report, we use the term crowdworkers synonymously with platform workers, online freelancers and simply workers to refer to people who find work via online labour platforms. The term 'crowdworker' is used in parts of European academic and policy discourse, while the workers themselves prefer terms such as 'freelancer'. Different online labour platforms also have different ways of referring to their workers, with Fiverr using the term 'seller'. The terms carry slightly different meanings and connotations in different communities, but in this study we are using them interchangeably.

adopting new, digitally powered and work-integrated learning practices? Are platform companies or other institutions in the online labour market supporting them in any way? The second difference between crowdwork and standard employment is that, in the latter, publicly regulated qualification systems play an important role in matching skills supply with demand. But in the online labour market, skills matching appears to rely on crowdwork platforms' proprietary data and matching systems (Lehdonvirta et al., 2019). There is a lack of clarity over what these systems are, what evidence there is about their efficacy and what implications they have for the portability of skills across contexts.

The purpose of the CrowdLearn research project was to address this gap in our understanding of skill development and skills matching in crowdwork and to consider the implications for European skills and education policy. Since crowdwork represents a departure from the standard model of employment, the standard tools of skills and education policy - the tools used by European policy-makers to address skills gaps, skills mismatch, digital skills and other education and training-related issues - may not always be applicable in this new context. New tools may be needed, and since crowdwork exemplifies trends in the broader labour market, policy lessons drawn from it may also be useful in informing future European skills policy more generally.

The research was structured around the following research questions (RQs):

- (a) RQ1: What skills do crowdworkers develop through their work on online platforms?
- (b) RQ2: What are the learning processes both individual and social – through which crowdworkers develop skills; what types of workplace learning activities and self-regulatory learning strategies do they use to develop these skills?
- (c) RQ3: What, if any, differences are there in learning practices and skill development

between different types of workers and between different national contexts in which platforms operate?

- (d) RQ4: How and to what extent do platform markets currently promote effective development and utilisation (matching) of crowdworkers' skills; and what formal, non-formal and informal certification practices, or other types of support for learning and skills matching are utilised?
- (e) RQ5: What are the challenges of facilitating inter-platform recognition and portability of crowdworkers' skills?
- (f) RQ6: How can skill development and matching in online platform work be improved; what design and policy recommendations can be made to improve these?

In a previous publication (Cedefop, 2019) we reviewed the scholarly and policy literature on these questions, identifying significant gaps in knowledge. In this report, we add findings from our original empirical research, using a mix of qualitative and quantitative methods, to address these questions. The qualitative component of the research project consisted of interviews with 77 European crowdworkers and 25 representatives of stakeholder organisations, including online labour platforms, policymakers, and trade unions/associations, as well as publicly available materials on platforms' provisions for learning and other supplementary data. The quantitative component consisted of an online survey of 1 001 crowdworkers across four major platforms; participants in the interviews and the survey were required to have been engaged in online crowdwork from one of six European countries, exemplifying different types of labour market regimes and welfare state models: Germany, Spain, Italy, Romania, Finland and the United Kingdom. A detailed description of the survey and interview methodologies can be found in Annex A1.1. An overview of the survey sample is presented in Figure 1.

Number of respondents (Share of respondents, in %)									Ma	e	Fema	le 📃	Other						
1.001			30%		_														
53%							4	2%											
47%												27	%				1%		
Total			Fivver				Up	owork				PP	Ή				Othe	r	
Primary project category	Total (%)		ł	•											<u>(6</u> )				
		Q	Ŷ	Ŷ	Q	Ŷ	ð	Q	Ŷ	Ŷ	مٍ	Ŷ	ð	Q	Ŷ	Ŷ	Ą	ç	Ŷ
Creative and Multimedia	28%	9	13	0	18	11	0	32	22	0	20	10	0	12	12	0	66	49	2
Writing and Translation	31%	17	29	1	20	27	0	20	40	0	6	14	0	15	20	0	35	61	1
Software Development & Technology	12%	7	1	0	16	2	0	13	0	0	14	8	0	9	3	0	40	8	0
Sales and Marketing Support	10%	5	5	0	7	5	0	10	9	0	9	7	0	7	4	0	20	8	0
Clerical and Data Entry	9%	1	3	0	2	5	1	3	5	0	5	6	0	5	8	0	18	28	0
Professional Services	8%	3	0	0	10	7	0	9	4	0	7	8	0	7	4	0	17	9	0
No Data	3%	0	0	0	2	3	0	1	1	0	1	0	0	2	2	0	10	5	0
Total (number respondents)	1001	42	51	1	75	60	1	88	81	0	62	53	0	57	53	0	206	168	3
			9%			14%			17%			11%			11%			37%	

#### Figure 1. CrowdLearn survey sample characteristics

Source: Cedefop's CrowdLearn data set.

The largest numbers of survey respondents were working from the United Kingdom (37%), Italy (17%) and Germany (14%). Roughly half of our respondents were women (47%). When asked to indicate their primary job category, the greatest proportion of respondents selected writing and translation (31%), followed by creative and multimedia (28%), and software development and technology (12%).

In this report, we present answers to the research questions as follows. In Section 2.1 we examine what skills crowdworkers develop in platform work (RQ1) and the differences in the types of skills developed between different types of workers (as in occupation and level of engagement with crowdwork) and between national contexts (RQ3). In Section 2.2, we examine what learning processes, in particular workplace learning activities (WLAs) and self-regulatory learning (SRL) strategies, crowdworkers have adopted, and what differences there are between types of workers and national contexts (RQ3) with regards to learning activities and strategies. In Chapter 3, we shift focus to institutions such as platform companies and learning providers, investigating what role they are currently playing in crowdworkers' skill development (RQ4a). In Chapter 4, we examine what mechanisms these institutions are providing for skills matching in the online labour market (RQ4b). In Chapter 5, we consider the implications of these mechanisms for the portability of crowdworkers' skills across different platforms (RQ5). In Chapter 6, we synthesise our findings into recommendations to European policymakers, platform companies, and other stakeholders concerned with skills development and the effective matching of crowdworkers' skills to demand.

#### CHAPTER 2.

# Findings on skills and skill development in crowdwork

#### 2.1. What skills do crowdworkers develop?

In this section we are concerned with the question of what skills crowdworkers develop through their work on online platforms (RQ1). We addressed this question as follows. Based on interviews with crowdworkers, we developed a typology of skills involved in crowdwork. The typology distinguishes between those skills learned prior to joining a platform and subsequently applied in platform work, and those skills developed in and through platform work. We then used our survey of crowdworkers to validate the typology and to examine what differences exist in skill development between different types of crowdworkers and different national contexts.

### 2.1.1. Skills developed and applied through crowdwork

Figure 2 presents the top-level categories of our typology of skills developed in crowdwork and

some illustrative examples, as identified as part of the CrowdLearn project.

The full typology, with 123 distinct skills learned before joining a platform and 89 distinct skills learned during crowdwork, can be found in Annex 2. This incorporates many of the types of skills that have been known from the literature to be developed through on-the-job, workplace learning. However, one key finding is the extent to which workers focus on the development of technical/core skills in their on-the-job learning. Conventional educational and training literature tends to view technical/core skills as the domain of formal training, claiming that new technical skills are developed through formal training and subsequently honed and contextualised through applying these in the workplace. This conventional view has been critiqued and empirically invalidated within the literature on workplace learning. The findings therefore provide further evidence that the workplace is a legitimate and powerful space of learning, where important

Skills typology	Examples	prior to	during
Technical/core skills	Computer programming, marketing	228	265
Language skills	English, French, Spanish	61	18
Computer literacy		7	0
Communication skills	Communication skills, handling customers	51	112
Organisational skills	Project management, time management	8	56
Personal dispositions/attributes	Independence, confidence, creativity, resilience	18	89
Learning to learn		1	39
Analytical skills		1	0
Setting up as a freelancer	Taxes, obtaining business permits	0	28
Obtaining work on platform	Pricing, applying for work	17	177

#### Figure 2. Top-level categories of typology of skills developed by crowdworkers

NB: Number of mentions of skills in crowdworker interviews Source: Cedefop's CrowdLearn project.

#### Figure 3. Necessary crowdwork skills developed prior to and during online platform work

#### Share of respondents, in %



I developed these skills before joining the platform but found them useful during crowdwork in the past three months
I have developed these skill categories at least weekly through crowdwork in the past three months

Source: Cedefop's CrowdLearn data set.

new core skills can be developed rather than only applied.

Further, the CrowdLearn study reveals two novel findings regarding freelancing-specific skills categories which have not yet been reported in the literature on skills: obtaining work on a platform and setting up as a freelancer. The first comprises skills required to navigate the unique environment of platform-based work, in terms of mastering platform user interfaces, optimising one's profile to appear frequently in search results, reading the market to pitch and price one's services appropriately, and other similar skills. The second comprises skills necessary for operating as a self-employed person more generally, such as registering as a business and dealing with finances and taxation.

Figure 3 reports the share of respondents who have developed skills belonging to each of the skills categories, at least on a weekly basis, before and during crowdworking. The figure indicates that technical/core skills, communication skills and organisational skills are usually developed before entering crowdwork by most respondents. The same is true to a slightly lesser extent of language skills, personal dispositions and digital literacy. These findings suggest that prior education and training and/or work experience provide a baseline level of marketable core skills and non-cognitive skills necessary in platform work. The highlighted importance of non-cognitive skills aligns well with recent research on the changing nature of working online that underlines the importance of such skills (Gonzalez Vazquez et al., 2019).

The above findings have implications for discussions on the suitability of online labour platforms for labour market integration. The Crowdlearn data suggest that, as in conventional workplaces, less experienced workers are at a disadvantage in terms of skill endowments. Workers with more than three years of general work experience reported more than one additional marketable skill before joining the platform, compared to novices with less than a year of experience. For technical core skills this implies that two thirds of the experienced cohort of online crowdworkers can draw on existing knowledge, compared with only about half of novices who do so.

Large proportions of respondents also reported developing skills during crowdwork itself. It is apparent that continuous skill development is common among crowdworkers, with many respondents reporting some development of the itemised skill categories on a weekly or daily basis; less than 2% of respondents appeared not to develop any of the skill categories over the past three months.

For those skills that are being improved during crowdwork, respondents reported developing them slightly less frequently than, on average, weekly. Crowdworkers appear to be more likely to develop their non-cognitive skills, for instance how to communicate with clients, ways to self-organise or their personal attributes, as well as platform- and freelancing-specific skills. These skill categories appear to be an elementary part of crowdwork. Between a fifth and a third of respondents indicated that they develop organisational and communication skills, their personal dispositions and both platform and freelancing-specific skill categories through their project work daily. By contrast, technical or core skills, foreign language proficiency, analytical thinking and digital literacy are among the relatively less frequently developed skills; only about 15% of freelancers stated developing such skills through their platform work daily. Skill development appears to be most frequent in the second and third year of crowdwork, suggesting a possible potential plateauing of learning intensity of crowdwork.

Figure 4 depicts the share of respondents who deliberately invested time in developing or improving a specific skill category in the past month. This number can be interpreted as a proxy for crowdworkers' current learning focus and identified skill gaps (specifically for their platform work, but it could also refer more generally to efforts to improve overall job market prospects). The categories where respondents mostly focus their skill development during crowdwork are technical/core skills and communication skills: 59% and 42% of workers, respectively, reported having taken time to improve these skills last month.

A regular focus on improving skills is highest among workers engaged in creative and multimedia and software and technology development as their primary project categories. More than three-quarters of respondents in these groups said they developed their core expertise in the previous month. A possible explanation can be that both sub-fields are subject to more rapid technological development than other project categories in our sample. By contrast, more than 40% of workers active in clerical or data entry projects reported spending time on improving the skill of 'obtaining platform work'; this is second only to core/technical skills for this group of workers. Given the relatively lower complexity of tasks comprising most clerical or data entry projects, the need to improve in gaining projects online could reflect greater competition for such projects.

For skills categories actively improved by only a small proportion of workers, especially digital literacy, it may be that people who enter crowdwork have already reached a satisfactory level of competence and see less need for further skill development. For instance, lower relative levels of investment in more learning with increasing age are generally observed, but it is notable that almost 30% of the over 60-yearolds actively improved their digital literacy in the previous month, compared with a sample average of 11%. A possible explanation is that these workers have had relatively less exposure to digital technology throughout their life and therefore must consciously spend time to stay up-to-date with technological advances in crowdwork, or their field of expertise more broadly.

These findings align well with an observation from the project's stakeholder interviews: that crowdworkers are very much concerned with cost-benefit calculations, especially when investing time or money into learning. Development in more sophisticated technical and communication skills, with a potential to produce an immediate return on investment through additional and potentially better paid projects becoming available, or better reviews resulting from better project results or interpersonal communication, is more likely to be pursued.

In contrast, it might be less obvious to crowdworkers if and how they may improve more abstract skill types, such as analytical thinking or learning to learn. These are meta-cognitive skills, so many people may not be explicitly aware that they are developing them in their everyday work. Personal dispositions may also be perceived as part of one's personal-psychological structure; these largely become set earlier in life and/or during one's education, making them less central to everyday workplace learning activity.

### 2.1.2. Differences in skill development between types of workers and countries

The survey data collected also allows examination of how various types of workers in different social and national contexts may differ when it comes to skill development in crowdwork (RQ3). The average frequency of skill development across our skill typology differs for various types of workers (Figure 5).

Those who spend more time on a platform, for instance, and those for whom their work on the platform is a primary source of income, re-

## Figure 4. Crowdworkers' learning focus in the past month: skill groups they have actively spent time on developing or improving



Share of respondents, in %

Source: Cedefop's CrowdLearn data set.

#### Figure 5. Average frequency of skill development in crowdwork by selected characteristics

As group averages across entire skill typology (10 skills types, 0-3 scale)

Worker characte	eristics	On occasion (Average=1)	Weekly	(Average=2)
	Finland	1.6		
	Germany	1.6		
Country of	Italy	1.7		
work	Romania	1.8		
	Spain	1.7		
	United Kingdom	1.5		
	Clerical and Data Entry	1.7		
	Creative and Multimedia	1.7		
Primary	Professional Services	1.6		
project category	Sales and Marketing Support	1.7		
	Software Development & Technology	1.5		
	Writing and Translation	1.6		
	Doctorate	1.9		
	Bachelor or Master	1.6		
Educational	Vocational degrees	1.4		
Dackyrounu	Non-tertiary academic degrees	1.7		
	Below secondary	1.5		
Primary	[Platform] as primary income	1.9		
income	[Platform] not as primary income	1.6		
	5	1.6		
	10.5	1.7		
Hourly wage	23	1.7		
(USD/h)	40.5	1.5		
	75.5	1.4		
	100	1.1		
Lovel of	High	2.0		
self-regulated	Medium	1.6		
learning	Low	1.2		
	Female	1.7		
Gender	Male	1.5		
	Other	1.5		
		0 1		2

Less than 50 observations

Source: Cedefop's CrowdLearn data set.



## Figure 6. Difference in frequency of skill development by skill category and primary project category

Source: Cedefop's CrowdLearn data set

ported a higher average frequency of skill development over the past three months.

Raw frequencies of skill development differ only marginally according to primary project category: the type of work primarily undertaken on the platform. When focusing on the specific types of skills being developed, differential skill development patterns are apparent between professional groups (Figure 6). For instance, language skills are less frequently developed than other skills among crowdworkers in general, but relatively more frequently among respondents who write or translate online as their primary project focus. Creative and multimedia workers and those primarily active in sales and marketing develop their communication skills more frequently than most other groups. This could reflect a need to communicate more often and in greater detail with clients to understand their desired creative output, corporate brand or strategic goals to be achieved through marketing or sales projects.

Crowdworkers in fields with relatively higher levels of task complexity, such as software and technology development, or those with relatively more opportunities for on-the-job learning, such as creative and multimedia work, report more frequent development of their technical/core skills than those active in less complex and routine project categories, such as clerical work and data entry.

For the most part, digital literacy skills are developed prior to starting crowdwork, but more than half of clerical and data entry workers continued to develop these skills throughout their time working on a platform, on at least a weekly basis. The same holds for analytical and learning-to-learn skills. One possible reason for this could be that these workers have, on average, the lowest baseline level of such skills, as this category of work is less dependent on formal education or prior work experience. For digital literacy, another possible reason is that workers focusing primarily on clerical and data entry benefit more from rapid typing skills and operating the computer fluently, as the work is typically paid on a piece-rate basis (Lehdonvirta, 2018).

The mean frequency of skills development in crowdwork also differs between workers located in different countries (Figure 5). An overall pattern across most skill categories is that a larger share of crowdworkers located in relatively lower-income countries (Spain, Italy, Romania) report more frequent skills development than those located in countries with higher average incomes (Germany, Finland, UK). This trend is also shown in Figure 7 and further evidenced by data from our qualitative crowdworker interviews, indicative of people in lower-income countries entering crowdwork with relatively less relevant work experience or formal education and hence requiring more skill formation. Other stakeholders also suggested that in countries such as Finland there is greater emphasis on teaching skills relevant for crowdwork, such as digital literacy, as part of formal education. Our survey data support this potential explanation for some skill categories like communication and digital literacy, but not for others (including technical/core skills).

Another possible explanation is that workers from lower-income countries are more dependent on their platform work and thus more motivated to maintain and develop their platform-relevant skills, compared to counterparts from richer countries with better local labour market opportunities and welfare systems. In addition, workers from lower-income countries sometimes face greater hurdles in winning projects and may have to work harder to hone and prove their skills (Lehdonvirta et al, 2019), a point echoed in some of the CrowdLearn interviews with workers from Spain, Italy and Romania.

National differences are also apparent in the types of skills crowdworkers develop. UK-based workers are significantly less likely than participants from other EU countries to report developing their language skills. This is unsurprising given that the largest online labour platforms operate in English and that most clients are also located in English language countries (Kässi and Lehdonvirta, 2018). A lower proportion of workers in Germany and Finland develop their digital literacy skills daily or weekly, while workers in Spain and Romania are more likely to be in the process of developing their language skill set. Germany-based workers also develop their analytical skills less frequently compared to workers based in Romania. There are various possible explanations for these differences, including prior research showing that people in Finland (69%) and Germany (68%) have higher rates of basic digital skills compared to other EU member states (such as Spain, at 53%) (2). Higher rates of employment and graduation from tertiary education in these countries (3) also indicates a need for more skill accumulation by workers based in lagging countries who wish to be successful in crowdwork.

There are also gender differences in skills development during crowdwork. In the CrowdLearn survey sample, females are overall more likely to report developing their skills during crowdwork than males (Figure 5) (4). The largest differences in skill categories between men and women are observable in skills relating to organisational abilities and personal dispositions. Women's greater emphasis on learning during crowdwork is unlikely to be explained simply by lower baseline skill levels because, in the sample, women have, on average, more formal education and more years of prior work experience than men (Figure 8). The greater emphasis among female crowdworkers on developing communication and other non-technical skills could be explained in part by their overrepresentation in writing and translation work. Among other potential explanations to be further researched, these patterns

<sup>(2)</sup> https://ec.europa.eu/digital-single-market/en/news/digital-skills-gap-europe

<sup>(3)</sup> https://ec.europa.eu/eurostat/statistics-explained/index.php/Tertiary\_education\_statistics

<sup>(4)</sup> Respondents identifying as neither male nor female were too few to examine statistically and have not been included in the genderbased analyses.



#### Figure 7. Difference in frequency of skill development by skill category and location of work

Share of respondents who in the past three months developed skills categories through crowdwork at least on a weekly basis, in %

Source: Cedefop's CrowdLearn data set

may suggest that female crowdworkers may be more motivated to improve their skills to compete successfully with others in crowdwork. Recent research suggests that significant gender disparities exist in online platform work, including among European platforms and workers, whereby women tend to request lower rates but obtain more hours of work (Gomez-Herrera and Mueller-Langer, 2019).

Figure 5 additionally suggests that crowdworkers with a vocational degree (n=100) engage less frequently in skill development during their online projects. Almost 60% of those workers with a vocational background engage in either writing and translation or creative and multimedia work. Most of these workers are men (60%), on average 38 years of age, constituting an old sub-group. While these respondents reported a slightly lower than average propensity to self-regulate their learning, their above average levels of experience and hourly wage suggest that they are already relatively specialised and subsequently may have higher opportunity costs attached to skill development. An alternative explanation could be a decreasing focus on skill development with increasing age, an observation we make more generally for the frequency of skill development but also the application of workplace learning activities or self-regulated learning strategies.

In terms of the self-regulatory learning (SRL) orientation, our findings suggest that crowd-workers with a high SRL disposition score (as measured through a methodology outlined in Littlejohn et al., 2016a) actively develop their skills more than those with a medium or low SRL score. This is true across all skill types, suggesting that the SRL ability is critical for crowdwork-

#### Figure 8. Education, work experience and primary project categories by crowdworker gender

#### Share of respondents, in % of subgroup

	Doctorate	1	2
ation	Bachelors or Masters	70	56
al educ	Vocational degrees	9	11
Forma	Non-tertiary upper secondary	18	27
	Below secondary	2	4
e	1 year or less	4	8
cperien	Between 13 months and 3 years	16	18
neral e)	Between 37 months and 10 years	33	31
Ge	More than 10 years	47	43
	6 months or less	17	18
JCe	Between 7 and 12 months	10	14
experiel	Between 1 and 2 years	15	18
itform (	Between 2 and 3 years	18	17
Pla	Between 3 and 10 years	38	31
	More than 10 years	2	2
	Clerical and Data Entry	12	7
egory	Creative and Multimedia	26	31
ect cat	Professional Services	7	10
ary proj	Sales and Marketing Support	8	11
Prim	Software Development & Technology	5	19
	Writing and Translation	42	22

Female Male

Source: Cedefop's CrowdLearn data set.

ers to develop and maintain skills important for online platform work.

# 2.2. Ways of learning in crowdwork

In this section the learning processes through which crowdworkers develop skills during their work are examined (RQ2). The workplace learning activities and self-regulatory learning strategies crowdworkers use to develop the skills discussed in the previous section are analysed in depth. The research strategy used is as follows. A typology of learning activities and strategies was first adopted, based on an extant survey instrument, the Self-regulated learning at work questionnaire, SRLWQ (Fontana et al., 2015). This typology was further tested by using it to structure the questions for a part of the crowdworker interviews. The typology is presented in the Annex 3. The typology was then used in the CrowdLearn survey questionnaire to scope and measure the prevalence of these activities and strategies in crowdworkers' learning practices.

Some overall findings can be summarised as follows. Crowdworkers' learning goals tend to be self-initiated and motivated by personal interest, a desire to remain competitive (by acquiring skills listed in other crowdworkers' profiles) and a desire to complete new types of crowdwork tasks (by acquiring skills listed in job postings). The learning activities reported by crowdworkers are generally individual but also include some social learning activities. To source knowledge and resources for learning, crowdworkers most frequently use free, online resources which are most often discovered by searching for keywords on Google or YouTube. Resources used range from specific questions and answers (such as the Q&A website Quora), to multi-video tutorials on YouTube, to step-by-step guides on blogs, and MOOCs.

Time is a significant constraint on learning activities for the crowdworkers interviewed, as most either work full-time or balance crowdworking with offline work, formal education and/ or caring responsibilities. This pressure further directed the crowdworkers interviewed away from formal education towards informal, flexible, learning, including learning on-the-job. Stakeholders, especially corporate clients of platforms, stated that if the price of the work is high, they would not expect freelancers to undertake any on-the-job, trial-and-error learning but to come equipped with all the necessary expertise. Cost and the relevance of online learning materials – linked to time, and the importance of only spending time on necessary or particularly interesting learning – are also important considerations for crowdworkers.

The following subsections look deeper into crowdworkers' learning activities and learning strategies and examine differences between different types of workers (RQ3).

#### 2.2.1. Workplace learning activities

As a starting point for the development of the CrowdLearn survey questionnaire, a set of workplace learning activities (WLAs) introduced by Fontana et al. (2015) were used. The 15-item scale is structured around individual and social, as well as formal and informal, workplace learning activities, some of which overlap. Overall, the CrowdLearn survey findings suggest that the average crowdworker appears primarily to undertake informal rather than formal workplace learning activities and to prefer individual WLAs over social ones (Figure 9).

Online platforms as workplaces seem to encourage individual learning activities, possibly and partly because of the way in which the platform tasks are designed; complex interdependencies inherent in organisational jobs are, when translated into crowdwork tasks, deliberately designed out of the workflow. With regards to the workplace learning activities (WLAs) listed in Figure 9, almost two-thirds of workers reported learning by working alone to complete their projects daily. Similarly, crowdworkers reported that they frequently (at least weekly) reflect deeply on their work (73%), acquire new information to complete their projects (60%) and find a better way to do a task by trial and error (52%). One notable exception is the social workplace learning activity of receiving (presumably client) feedback

#### Figure 9. Summary of crowdworkers' workplace learning activities

#### Share of respondents, in %

Workplace learning activities (WLAs)



Frequency of use of WLAs over the past

(average share of

three months

#### Most and least frequently used WLAs (10 out of 15) Rank Daily or weekly use only (past three months)



NB: The typology of WLAs is adapted from Fontana et al., 2015. Source: Cedefop CrowdLearn data set.

on completed project work (70%). What this implies from a skill development perspective is that it could be beneficial to complement the current public, and mainly evaluative and summative, client feedback culture with private developmental and formative feedback to freelancers. Platforms could assist by including such private feedback as a standard option at the end of each project and assisting clients with a small number of standardised guiding questions to help them structure feedback.

Social workplace learning activities beyond seeking and receiving feedback are less commonplace. Only 17% of respondents regularly (at least weekly) collaborate with others to complete their work. Similarly, only a small proportion of crowdworkers regularly ask others for advice (19%), observe and replicate other people's strategies (34%) or learn from online community forums (31%). Given that online feedback culture was originally formalised by integrating it into the workflow of online platforms and their technological infrastructure, it remains a question for further research whether the same could be achieved for other social and collaborative learning activities.

The individual, geographically dispersed and 'just-in-time' nature of crowdwork reduces the relevance of formal learning activities, such as physically attending training courses or workshops. 64% of survey respondents reported that they have not undertaken any formal learning in the past three months. Uptake of paid online courses, webinars and tutorials appears to be equally low, with 74% of respondents saying they had not engaged in any such learning activity recently. Free online courses or webinars appear to be an exception, however, with a fifth of crowdworkers having attended a free course at least weekly. However, more than half of the CrowdLearn sample did not make use of such offers at all. This again supports the qualitative insights of the project, which revealed that crowdworkers critically evaluate formal training offers with respect to monetary cost, but also the necessary time investment.

The most frequently used workplace learning activities may also reflect some of the specifici-

### Figure 10. Comparison of tasks and use of WLAs by crowdworkers in writing/translation versus software and technology development



Maximum across both groups

\* Share of respondents that engaged in this activity at least on a weekly basis *Source:* Cedefop CrowdLearn data set. ties of each occupational group. Occupational cultures and the nature of work tasks may be some of the key factors influencing the learning activities most frequently undertaken by a worker and further research is required to elucidate and analyse the relevant factors. A short comparative summary of the tasks and learning activities of those primarily active in writing and translation with those in software and technology development, best illustrates the task-specific nature of learning (Figure 10).

The survey data indicate that these groups of crowdworkers are required to fulfil tasks with often different demands. For instance, writing or translation projects tasks are more likely to be considered creative but also routine, relative to those in software and technology development. But those active in the latter project domain are relatively more likely to highlight the need for complex skills and specific expertise, the ability to deal with new problems, collaboration and unique solutions to completing their tasks. It should not be surprising, therefore, that learning activities differ considerably among these two groups of crowdworkers.

Those primarily active in writing or translation also spend less time on social learning activities than do all other occupational groups, including software and technology development. Only 8% of workers in this subsample noted that they collaborate with others on at least a weekly basis. 14% regularly ask others for advice and 17% make frequent use of online communities or forums, which is further supported by interview data that many individuals enter crowdwork in order to benefit from its distinct style of work (asynchronous, remote, self-directed, selfpaced). The need to keep up with new developments in the field appears to be relatively low, which may also be a factor underpinning why communal learning is uncommon for this group. Only 35% in this subgroup follow new developments in the field on a regular basis; 36% read books, while 6% attend more formal learning offers such as training/workshops or paid (4%) and free online courses (11%).

Those who are predominantly active in software and technology development, by comparison, appear to engage primarily in learning activities that help them stay updated on new information regarding their field of expertise. This is reflected by a larger share of this subgroup following new developments in the field (24% higher than those in writing or translation tasks), performing previously unknown tasks in their projects (22% higher) or reading relevant literature (17% higher) at least weekly.

Overall, changes in sector norms, trends and tools require more frequent upskilling and reskilling to maintain the employability of those working in software and technology development. Crowdworkers in software and technology development are also much more likely to engage in social learning activities, such as seeking assistance in online forums (74%) or collaborating with others (24%) on at least a weekly basis; this may be reflective of traditional collaborative and agile working cultures in this occupation. This sector also has a longer history of online freelancing compared to other sectors, so it may be unsurprising that online communities like stackoverflow.com are better developed and more frequently accessed. Crowdworkers in other sectors might find online communities as useful if they were as developed and ubiquitous.

The survey instrument measures self-reported task-complexity based on a scale, adapted from Morgeson and Humphrey (2006), scoping the variety and difficulty of skills needed to complete a task, the necessity for unique answers and the lack of obvious solutions novelty. Using this instrument, Figure 11 outlines the relationship between self-reported task complexity and the frequency of engagement with several workplace learning activities. Except for some social learning activities that are not prevalent in general, there appears to be an association between self-reported task complexity and certain WLAs. With increasing self-reported task complexity, a larger share of respondents regularly engages in activities that require critical thinking, adaptation to new problems and online collaboration.

Figure 12 also gives an overview of worker sub-groups and their average use of selected learning activities. Differences in learning activities between countries of work are generally not considerable but crowdworkers working



#### Figure 11. Relative frequency of use of WLAs by self-reported level of task complexity

Share of respondents who in the past three months used the respective workplace learning activities (WLAs) during crowdwork at least on a weekly basis, in %

Selection of WLAs

\*Respondents were asked about the nature of their tasks in terms of (1) complexity, (2) variety of skills needed to complete them, (3) the necessity of unique answers, (4) the lack of obviously correct solutions and (5) their novelty.

Source: Cedefop's CrowdLearn data set

from Romania, of whom more than 90% were also born there, report higher average frequencies of usage of WLAs and SRL strategies. This could be partially driven by the relatively high share of respondents with a tertiary education background in this subgroup. However, further research is required to identify and analyse other potential explanations.

Analysis of the relationship between task categories and learning tasks undertaken is out of the scope of this study so it is not possible to tell why workers within different task categories report different levels of engagement in workplace learning. Overall, the factors implicated could be individually based (that is, due to workers' individual characteristics), environmentally based, or both. The workplace learning literature has emphasised the importance of both individual factors (such as self-efficacy, motivation) as well as environmental factors (social, technological, organisational) in fostering learning (e.g. Bandura, 1997; Felstead et al., 2009). For example, Fuller and Unwin (2004) conceptualise a continuum of organisational learning environments, from expansive to restrictive. Specific jobs and economic sectors have been shown to differ in their learning-intensity (Skule, 2004). It is possible that some categories of tasks may require more or

#### Figure 12. Average frequencies of use of selected WLAs by subgroup

Share of respondents who use respective workplace learning activities (WLAs) at least on a weekly basis, in %

Worker characteristics	WLAS	Sele acti	Selected average frequencies of use of workplace learning activities (WLAs) by subgroup					
Primary project	Learning from online community forums	17	Writing and Translation		Software Development and Technology			
category	Following new developments in my field	28	Clerical and Data Entry	59	Software Development and Technology			
	Observing/replicating other people's strategies	24	Writing and Translation	50	Sales and Marketing Support			
Country of work	Receiving feedback on my [platform] projects (e.g., from my client, colleagues)		59 Finland		Romania			
	Performing tasks that are new to me	37	United Kingdom	57	Romania			
	Thinking deeply about my work (e.g., what I could do better next time)	66	Finland	84	Romania			
Education	Acquiring new information to complete my [platform] projects	51	Vocational degrees	72	Doctorate			
	Performing tasks that are new to me	29	Below secondary	50	Doctorate			
	Attending a training course/workshop to acquire knowledge/skills for [platform]	ng course/workshop to 6 Doctorate le/skills for [platform]		17	Vocational degrees			
Gender	Asking others advice	16	Male	23	Female			
	Receiving feedback on my [platform] projects	66	Male	76	Female			
	Learning from online community forums (e.g., StackOverflow)	24	Female	38	Male			

Source: Cedefop CrowdLearn data set.

less frequent upskilling and reskilling to maintain employability and competitiveness.

#### 2.2.2. Self-regulated learning strategies

Self-regulated learning (SRL) strategies are generally defined as 'self-generated thoughts, feelings and actions that are planned and cyclically adapted to the attainment of personal goals' (Zimmerman and Kitsantas, 2005). Zimmerman's model of self-regulated learning postulates that individuals self-regulate their learning in three phases: strategic goal planning, implementation/volitional control, and self-evaluation (Zimmerman and Kitsantas, 2005). Zimmerman and Kitsantas operationalise these phases into a set of further self-regulated learning sub-phases including goal setting, task analysis, self-control, self-efficacy beliefs, and self-observation. The CrowdLearn survey instrument included a scale to scope and measure the frequency of use of SRL strategies, based on Fontana et al. (2015), adapted to the crowdwork context. As described in Section 2.1.2, the ability of workers to self-regulate their learning is a good indicator for higher levels of skill development on the platform and more frequently conducted learning activities. The following section structures the empirical results around Zimmerman's original three phases.

Overall, crowdworkers report using a wide range of sophisticated SRL strategies to strategically plan, implement and reflect on their learning (Figure 13). However, crowdworkers' typical

#### Figure 13. Self-regulated learning (SRL) strategies in crowdwork

#### Share of respondents, in %

	I set my own performance standards for my projects on [platform]		38		45		14
	Before I begin a [platform] project I ask myself what I need to learn to complete it	25		30	:	29	
	I come up with several strategies to reach my learning goals and choose the best strategy	13	28		34		
Planning	I set long-term learning goals (i.e. yearly or longer)	12	24		38		
	I set short-term learning goals (i.e. monthly or quarterly)	8	26		39		
	I make a plan of how I'll achieve my learning goals	8	23	38	B		
	When faced with a challenge I try to understand the problem as thoroughly as possible		61			34	5
	I apply lessons learned from my previous work to my [platform] projects where appropriate		43		40		13
	I am confident I can meet all demands in my work on [platform]		37		51		10
	I think I will be able to use what I learn on [platform] in my future jobs	_	36		41	2	21
	When learning, I collect information from many different sources		34		43	1	8
	It is important for me to learn new things in my [platform] tasks	2	8	32		30	
	I adapt my learning strategies to each [platform] project	25	i	36		26	
	When learning, I treat the new information I find as a starting point and develop my own ideas from it	22		45		27	
	I ask myself how what I am learning is related to what I already know	22		38		28	
	I change my strategies when I don't make progress with my learning (e.g., how I am learning a necessary skill)	22		37		29	
Implementation	To reach my learning goals, I use strategies that have worked in the past	21		45	45		
	Before joining [platform], I signed up to other platforms to test and learn how to be successful in online work	20	17	18			
	I make notes or diagrams to help organise my thoughts	19	22		29		
	I prefer challenging projects, even if I need to learn a lot to complete them	challenging projects, even if I need to learn a lot to complete them <b>1633</b>				10	
	I meet my learning goals	14				29	
	I prefer projects that require me to learn something new	14 31			4	4	
	When having difficulty learning something I ask others for help	13	27		39		
	I change my learning goals (e.g., what specific skill I would like to learn next)	11	32		41		
	I regularly review progress towards my learning goals	7	25	3	8		
	I use different strategies for each thing I need to learn	7	31		51		
	I block time in my calendar to work on my learning goals	6 14	1	33			
	I think about how what I've learned on [platform] fits into the bigger picture of my professional development	26	6	39		26	
	After I finish a [platform] project, I ask myself if there were better ways to do it	23		37		32	
	I think about what I have learned once I've finished a project	21		37		33	
	I think about how what I have learned on an [platform] project impacts my other [platform] projects or my other jobs	20		40		30	
Reflection	I consider how what I've learned on [platform] may be of interest to others (e.g., other workers, colleagues)	13	32		33		
	I share what I have learned on [platform] with others	11	21	4	10		
	I write up private notes about what I have learned that I don't share with others	<mark>5</mark> 13	24				
	I write up notes about my learning and share these with other people (e.g., by posting in a public blog, etc.)	<mark>2</mark> 10	20				

Always true True most of the time Sometimes true

Source: Cedefop CrowdLearn data set.

learning strategies are relatively slightly tilted towards implementation rather than strategic goal planning or self-evaluation.

In terms of strategic goal planning, most respondents seem to set their own performance standards (83% state that this practice is always true or true most of the time), while roughly a third appear to be regularly setting short- and long-term learning goals, reviewing these and making learning plans. More than half of the respondents confirmed that it is true most of the time that their typical behaviour consists of first understanding what they need to learn in order to complete a project, prior to starting it. Many crowdworkers also report that they at least occasionally come up with several learning strategies to pick and choose the most suitable one for their goals or plan how to achieve them.

When it comes to implementation, 95% of crowdworkers agree that it is always true or true most of the time that they try to understand the problem thoroughly once they are faced with a challenge. On average, most crowdworkers apply lessons learned from previous work (83%) and collect information from many different sources to support their learning (77%) most of the time. Overall, they report high self-efficacy, demonstrated by reported confidence that they will be able to meet all the demands of platform work (88%) and able to use what they learned on the platform for future jobs (76%).

These implementation strategies to self-regulate learning paint a picture of crowdwork that is supported by the project's qualitative findings. Crowdworkers pragmatically rely on onthe-job learning and previous work experiences as needed to complete their current projects at hand. This is supported by those self-regulated learning strategies considered to be true most of the time by more than half of respondents in the CrowdLearn survey: considering new information as a starting point for subsequent ideas (67%), using strategies that have worked in the past (66%), adapting existing learning strategies to each project (61%), and changing them once they do not yield any results (59%). Constantly reflecting on how newly learned material is related to their existing knowledge (61%) is a strategy that in the learning sciences literature is known as 'activation' and that promotes learning.

Most crowdworkers also appear to meet their learning goals and are intrinsically motivated to learn and develop their skills. 60% report that it is important to them to learn new things in their platform work. However, on a regular basis, only a smaller subset of workers seems to integrate more formal strategies of learning implementation into their typical behaviour, such as making notes or diagrams (41%), regularly reviewing progress towards learning goals (32%) or blocking time in their calendar to learn (20%).

When it comes to reflecting on their learning, most crowdworkers make time to relate their new skills or insights to the bigger picture in terms of their professional development or other projects. About 58% in the survey sample appear to be engaged in reflecting upon and reviewing their learning progress. However, this reflection remains informal and private for the average worker, who will tend not to codify learning in the form of private or public notes or consider how others might benefit from new insights on a regular basis.

Evidence is also found of a considerable social dimension in some of the self-regulated learning strategies. 79% of crowdworkers report that they sometimes reach out to others for help when having difficulty learning. 72% have shared their learning with others at least sometimes.

Overall, crowdworkers' learning strategies appear to consist mainly of on-the-job learning without relying on many structured processes such as formal goal-setting or learning plans that would be commonplace within a traditional organisation. That said, they appear to reflect regularly on their learning, albeit only formalising or publishing these thoughts on occasion.

These findings are largely in line with existing research on crowdworkers' learning (Margaryan, 2019a and 2019b), further corroborating that, despite the absence of conventional organisational scaffolds for learning and development, crowdworkers are highly learning-oriented and engaged in a wide range of strategic SRL behaviours in their platform workplaces. Emerging economic research also confirms that crowdworkers can be 'highly forward-looking, abandoning
skills with no perceived future and picking up new skills, primarily through learning-by-doing' (Horton and Tambe, 2019).

The findings also corroborate previous research in workplace learning demonstrating that deep and powerful learning occurs in everyday working life (Billett et al., 2008; Illeris, 2011; Malloch et al., 2011), and suggesting that platform workplaces are not an exception. A considerable amount of evidence has been collected over decades of research in workplace learning demonstrating that, rather than drawing on formal learning and training, adult professionals develop skills predominantly through on-the-job/ informal learning mechanisms including deliberate practice (Ericsson et al., 2006), reflection and action (Schon and DeSanctis, 2011), self-regulation (Zimmerman, 2006), mimesis (Billett, 2014), recontextualisation (Guile, 2011) and knowledge sharing and collaborative problem solving (Boisot et al., 2011).

As the CrowdLearn study shows, skill formation in platform workplaces is also underpinned by many of these on-the-job learning mechanisms. More attention should therefore be given by policy to creating and fostering the environmental conditions to enable people to develop the mindsets, capabilities and skills strategically to self-regulate and self-direct their learning and proactively set up mutually beneficial cooperative learning relationships with other people.

## CHAPTER 3.

# Findings on how platform markets promote skill development

In the previous section the issue of skill development was approached from the workers' perspective, examining what learning strategies they employ. This section focuses on the extent to which platform markets promote the effective development of crowdworkers' skills (RQ4a). The issue is approached from the perspective of platform companies and other organisations and institutions involved in the platform economy, asking what kind of support they may be offering to crowdworkers to promote their learning activities. The findings are mainly based on interviews with multiple stakeholders: representatives of platform companies, platform clients, labour unions, independent worker associations, learning providers and policy-makers. Relevant websites and press releases were also reviewed. This section draws on evidence from both the stakeholder interviews and survey of crowdworkers to triangulate the findings and add to the workers' perspective described in the previous chapter.

Overall, the picture that emerges is that while crowdworkers remain responsible for their own skill development, various stakeholders are providing different types of formal and informal support and resources to help them. The degree to which the workers find this support useful varies and there are opportunities for improvement.

# 3.1. Stakeholder role in crowdworker skill formation

# 3.1.1. Platform companies' role in skill development

Online labour platforms are involved in supporting their workers' skill development in several, mostly indirect, ways. The main mechanisms through which this takes place are as follows (detailed case examples are provided below):

- (a) publishing data on which skills are in demand, to help workers develop their profiles towards clients' expectations (Figure 14);
- (b) getting clients to give feedback to workers, to help workers identify their strengths and weaknesses;
- (c) referring workers to learning providers that offer relevant courses or resources;
- (d) providing a venue for workers to engage in peer-to-peer support and learning;
- (e) in one case, providing a training marketplace, in which skilled freelancers offer training to other freelancers, blurring the distinction between a labour platform and a learning provider.

Platforms vary in the extent to which they provide these mechanisms. The depth of platforms' commitment to skills depends on their business strategy and their perceived legal constraints. Online labour platforms generally do not see a business case for more direct involvement in training their workers. As one platform executive said, 'As a platform at the moment, it's not our goal to develop freelancers to learn new skills. It's our goal to find freelancers with the right skills'.

The market is segmented in such a way that platform companies such as Upwork and Twago place the biggest clients and the most skilled crowdworkers in separate 'enterprise' versions of their platform; other clients and less acknowledged crowdworkers are hosted in the public 'marketplace' versions of the platform. According to a Twago executive, the crowdworkers on the enterprise version are 'highly skilled people who already know what to do and have done the job before'. Upwork also wishes to attract 'very highly skilled professionals' who are 'at the top end of certain professions'. The platform companies see their biggest growth potential in the

# Figure 14. Upwork's list of top 20 fastestgrowing skills, Q2 2019

The top 20 fastest-growing skills, Q2 2019
1. ServiceNow
2. DaVinci Resolve
3. Social video marketing
4. Highcharts
5. PyTorch
6. Keras
7. Caspio
8. LearnDash
9. Kendo UI
10. Technical recruiter
11. Neo4j
12. Statistical modeling
13. Salesforce Lightning
14. Relational databases
15. d3.js
16. Motion graphics
17. MATLAB
18. Packaging design
19. SEOMoz
20. Microsoft Azure

Source: Upwork.

enterprise versions, but training such workers is expensive and risky, because they may take their skills elsewhere. Rather than investing in directly supporting freelancers' skill development, platforms therefore invest in their crowdworkers' satisfaction, community promotion and marketing initiatives to attract and retain skilled workers from outside.

Platform companies are also concerned that too much involvement in skill development and training could risk them being potentially reclassified as employers, which they wish to avoid. This is because, in many jurisdictions, the provision of training is considered one of the hallmarks of an employment relationship; it could potentially be used to argue that platform workers should be classified as employees in a lawsuit challenging their employment status. Overall, the platforms see themselves as having only a limited and indirect role to play in supporting crowdworkers' skill development.

The crowdworkers interviewed also saw a limited role for platforms in supporting skill development. Some considered that platforms had a role in providing tutorials and guides on platform-specific issues, such as how to design an attractive platform profile, how to navigate the platform's escrow process, or who to contact in case of a dispute with a client. But they did not see platforms as experts on the skills they were selling and so did not view them as well-placed to offer learning materials or other expert guidance in these areas. Instead, workers preferred to seek out learning materials from other sources they did see as hubs of expertise, such as recognised professionals in their field who provided tutorials on YouTube. This suggests that platforms wanting to get more involved in workers' skills development would first need to become better recognised as sources of expert knowledge.

Several crowdworkers expressed concerns that if platforms offered too much guidance in the way of general freelancing skills, then this would flood the market with crowdworkers who knew how to market themselves but did not necessarily possess strong technical/core skills. There was a general worry - the market already being perceived as highly competitive - that any additional boost to less successful workers would dilute the amount of work available (although the competition situation varies between market segments, with some experts such as mobile app developers remaining in high demand). This indicates that current successful crowdworkers and platforms partly agree, though for different reasons, that crowdworking platforms should maintain a limited role in workers' skills development.

## 3.1.2. Client role in skill development

Online labour platforms have a wide range of clients, from individuals to small- and mediumsized enterprises, to large multinational corporations. Different clients seek different benefits from using online labour markets (Corporaal and Lehdonvirta, 2017). Some clients seek cost savings, as platforms provide access to workers in lower labour cost countries. However, cost savings may not be the main selling point, especially for platforms that cater for highly skilled work. Clients use platforms to access specialised skills that are not available in their local labour markets and/or are only needed occasionally. Compared to conventional staffing agencies, platforms are often able to provide faster fulfilment times and lower overhead costs (Corporaal and Lehdonvirta, 2017). They are also easier to access for SMEs and individual entrepreneurs who would not typically use the services of a staffing agency. By helping firms overcome local skills gaps, online labour platforms may be helping to boost growth, although quantitative evidence on this is lacking.

A significant point of difference between traditional employment and staffing agency work compared to crowdwork concerns training provision. Larger employers, especially, often provide training for their workers, and there are often public policies in place to support this. In crowdwork it is exceptionally rare for clients to provide any degree of training for workers. At most they might provide documentation or guidance on any company-specific systems or technologies that the worker is expected to use as part of the engagement.

A representative of a large European company, a client of an online labour marketplace, reported that they did not view training crowdworkers as their responsibility, as it was the latter's responsibility to invest in their own training. Moreover, clients often turn to platforms, as opposed to staffing agencies or other established contingent labour providers, when they need very fast turnaround times (Corporaal and Lehdonvirta, 2017). Consequently, they require workers able to start the work immediately, without any further time investment in training. In the high-end enterprise segment of the market, contracts are also costlier for clients, so there is little or no tolerance for some important forms of onthe-job learning, such as trial-and-error. It is also worth noting that these enterprise clients often look for crowdworkers with strong experience in applying their skills in a very specific business context or industry. This emphasises the importance of upskilling via informal learning, in contrast to de-contextualised training courses.

Nevertheless, some grey areas are evident in the relationship between crowdworkers, clients and skill development. Some crowdworkers reported that they are sometimes explicitly encouraged by their clients to learn on-the-job, using self-discovered resources and unpaid personal time; others admitted to engaging in onthe-job learning during billable hours, outside the client's knowledge.

Besides financially supporting self-directed learning activities, probably the most effective way in which clients indirectly support crowdworkers' skill development is by giving feedback on performance. 92% of respondents in the CrowdLearn survey stated that they receive feedback on their projects by clients or fellow crowdworkers. However, the amount, accuracy and timeliness of the feedback that clients give varies widely between them and engagements. Platforms are typically designed to try to elicit feedback from clients, which is helpful. But platforms typically focus on evaluative feedback intended to help prospective future clients, instead of developmental feedback designed to help the worker develop their skills. Clients could contribute more to crowdworkers' skill development if there were more incentives, structure, or culture in place for clients to give constructive developmental feedback to their workers.

# 3.1.3. Trade union and self-employed worker associations' role in skill development

Trade unions have a tradition of supporting the training and skill development activities of workers, which sometimes includes self-employed freelance workers. For instance, the National Union of Journalists in the UK provides certified training courses and workshops and curates resources for trainees who are looking for trusted pathways to a career in freelancing. More recently, self-employed freelance workers' associations, such as the US-based Freelancers Union, have also started to provide different forms of support for their members.

Union membership among online freelancers, however, is rare (Wood and Lehdonvirta, 2019). Only 8% of the respondents to the CrowdLearn survey are a member of a union or association. Among those who are, in only less than half the cases is the membership related to their online freelancing activities. Similarly, none of the crowdworkers interviewed are members of freelancer-specific unions. Only four interviewees are or had been members of unions affiliated with their prior, conventional employment (for instance, an NHS employee with UNISON national membership), but none had received any support or educational materials related to freelancing. None of the union or association representatives interviewed said that their organisations offered direct skills training specifically for online crowdworkers. However, some crowd-

workers had received union training in their past traditional employment and were now benefitting from the skills in their platform work. All the union representatives interviewed recognised that engaging and supporting crowdworkers in their skills development is an opportunity to make unions more relevant, increase

union membership and improve the working conditions of more vulnerable crowdworkers. The Freelancers Union emphasised the need for unions to adopt a holistic approach to crowdwork, so that training covers running a small business, administration skills, managing health care and pension provision, entrepreneurial skills such as self-promotion and reputation management, as well as technical/core skills. Self-advocacy, especially during dispute resolution, could be an additional skill for freelancers to learn. A representative of IPSE – the Association of Independent Professionals and the Self-Employed - said that at the moment 'freelancers don't really know where to go' to acquire these skills, other than acquiring them through first-hand experience.

# 3.1.4. The role of policy-makers and government in skill development

In traditional labour markets, governments support skills development by funding training institutions, administering training schemes and offering vouchers and tax incentives to companies that train workers. They also aim to recognise and validate workers' informal skills. In contrast, none of the policy experts interviewed for this study could cite any specific policies for crowdworker skills development. Policy support for self-employed people's skill development more generally is also scarce.

Some of the workers interviewed expressed interest in a public platform or database that would make it easier for them to discover both online and offline courses that could support their skills acquisition and development. Crowdworkers generally said they wanted access to free, jurisdiction-specific training on issues related to the administrative aspects of working as a freelancer, such as taxes, business registration and managing their finances. Technical/core skills training is available from various learning providers, but there is no obvious destination for crowdworkers to learn the administrative side in most jurisdictions. This is one area where government could play a role, directly or indirectly.

# 3.1.5. Learning provider role in skill development

Learning providers, such as VET and continuing education and training institutions, have a well-established skill formation role in traditional labour markets. The proliferation of broadband internet has more recently also allowed various kinds of online learning providers to enter the market (<sup>5</sup>). There is an emerging market for online learning providers that specifically target freelancers. For instance, Simplilearn offers 'digital economy training', such as the Certified information systems security professional (CIS-SP) certification, which has become a prerequisite for those intending to be a freelancer in information security.

<sup>(5)</sup> For instance, in the UK, online learning provider Learn Direct was set up in 2000. Today, it sells a range of courses, including a Certificate in practical entrepreneurship. At one point Learn Direct operated with support from the UK government and the European Union. But, after State support was withdrawn, Learn Direct was taken over by a private equity fund and it is currently struggling to remain viable. More recent commercial online learning ventures providing massive open online courses (MOOCs) include Coursera, EdX, Udemy, Khan Academy, Udemy and Skillshare.

## Figure 15. Crowdworkers' use of learning activities in the past three months

#### Share of respondents, in %

How frequently have you undertaken the following learning activities as part of your crowdwork on [platform] over the past three months? Sample size: N=1 001, selected statements relevant for learning providers



Source: Cedefop CrowdLearn data set.

Overall, crowdworkers interviewed in the study tended to feel a certain level of scepticism towards most digital learning providers, each for their own reasons. Governments are viewed as unaware of how crowdwork functions and what is needed, formal education providers are believed to be several years behind the latest trends, and for-profit companies are believed to be primarily looking to make money from learners. This often means that crowdworkers are concerned they are either being sold courses that are not relevant to them or which have not invested the necessary time and care for their development:

'I use [various online learning providers] but, generally, what I see is that these are all businesses. Sometimes what I learn from there is very, I don't know... They want to entice you to pay for something that maybe you're not even going to need' (Cedefop CrowdLearn study crowdworker interviews).

This general scepticism translates into utilisation of paid learning services. Figure 15 illustrates that only up to a third of the CrowdLearn respondents indicated to have used paid training opportunities, such as in-person workshops (36%) or paid online courses (27%), at least occasionally over the past three months. Half of the respondents did not draw on free online courses, which can be explained by the fact that crowdworkers value their time in addition to their financial resources. More common are just-in-time learning activities such as looking up queries online, for instance in online community forums, or feedback specifically aimed at crowdworkers' output on the platforms in question.

Besides improving their offers to be more in line with crowdworkers' needs (and those of self-employed people more generally), learning providers will probably need to work more on gaining workers' trust. Efforts should also be made to separate high-quality providers from lower-quality ones.

### 3.1.6. Coworking spaces

As internet-mediated gig work and other forms of independent work have grown in popularity, so have coworking spaces. These typically take the form of a centrally located office space shared by employees of different companies and/or contractors. For a fee, these workers can afford shared

## Box 1. Skill development initiatives involving platform economy stakeholders

#### Initiatives realised by platforms

The French platform Frizbiz matches workers with clients to fulfil tasks like household repairs. Through Frizbiz, some workers participate in training programmes that are organised cooperatively with Leroy Merlin, a home improvement and gardening retailer. The training is free of charge and is provided either through online webinars, or at an in-person training session at the retailer company.

The Danish platform Happy Helper, which intermediates cleaning services, trains its workers in cleaning methods. Further, it provides workers with skills in how to use the Happy Helper platform and app and gives advice on how to conduct interpersonal communication with clients.

#### Initiatives involving trade unions

In the Netherlands, the platform Temper, which matches demand and supply for staff in hotels, restaurants and cafés, approached in 2018 the hospitality division of the largest trade union FNV (Federation National Unions, FNV-Horeca). They have signed a 'cooperation pact' as a pilot scheme to provide self-employed Temper workers with training, pensions and insurance. The cooperation pact was broadened later in 2018 after a positive experience in the first months, amongst others adding improved training offers.

### Initiatives involving public authorities

In 2018, the municipal administration of Milan, Italy, inaugurated an office to 'listening, information and advice' for workers in food delivery platforms. The office also offers free training courses on road safety, safety at work and basic sanitary rules for food transport.

Source: Eurofound's web repository on the platform economy. https://www.eurofound.europa.eu/data/platform-economy/records

infrastructure that they otherwise would not have access to as independent workers. In principle, shared working spaces could offer opportunities for peer learning that happens in the workplace in traditional employment (Eurofound, 2015).

Of the crowdworkers interviewed, only one interviewee (based in Germany) utilised a coworking space with other online crowdworkers, while one Spain-based crowdworker expressed interest in starting her own coworking space due to the lack of such an organisation in her village. However, several other crowdworkers identified the ability to work physically alone, asynchronously with co-workers and on their own schedule as reasons why they preferred crowdwork to more traditional, offline and workplace-based forms of work. It is not clear if crowdworkers' still quite infrequent use of coworking facilities is due to lack of access or simply lack of interest.

# 3.2. Case examples of platform support in skill formation

In this section we provide detailed case examples of some of the indirect mechanisms through which online labour platform companies support workers' skill development activities.

# 3.2.1. Providing information on in-demand skills

Proactive crowdworkers monitor the market for skills that are in demand and adjust their profile or update their skills in response. To assist in this, some platforms publish information on their most sought-after skills. Upwork, for example, publishes a quarterly list of skills where demand has grown most over the past quarter (Figure 14). However, it is not clear how valuable such platform-provided lists of in-demand skills are to crowdworkers. While some of them saw such lists as beneficial, they were more likely to mention that their most valuable recourse of action

## Figure 16. Example of Upwork's list of recommended courses

Here is a list of relevant online courses from online learning platforms, including Coursera, edX, PluralSight, Skillshare, Udacity and Udemy for the top 20 fastest-growing skills on Upwork in Q2 2019:
1. ServiceNow: The Complete ServiceNow Developer Course (Udemy)
2. DaVinci Resolve: Complete DaVinci Resolve 15 Video Editing (Skillshare)
3. Social video marketing: Digital Media and Marketing Strategies (Coursera)
4. Highcharts: Learning Highcharts (Udemy)
5. PyTorch: Deep Learning with Python and PyTorch (edX)
6. Keras: Deep Learning Fundamentals with Keras (edX)
7. Caspio: How to Build an Approval Workflow Application with Caspio (Udemy)
8. LearnDash: How To Create A Learning Management System With WordPress (Skillshare)
9. Kendo UI: Introduction To Kendo UI (Pluralsight)
10. Technical recruiter: IT Basics For Technical Recruiters (Udemy)
11. Neo4j graph platform: Hands-On: Getting Started With Neo4j (Coursera)
12. Statistical modeling: Data Science: Inference and Modeling (edX)
13. Salesforce Lightning: Salesforce Lightning Experience Training - Part 1 - Getting Started with Lightning Experience (Skillshare)
14. Relational databases: Intro to Relational Databases (Udacity)
15. d3.js framework: Learn and Understand D3.js for Data Visualization (Udemy)
16. Motion graphics: GROW YOUR MOTION GRAPHICS SKILLS (Pluralsight)
17. MATLAB: MATLAB and Octave for Beginners (edX)

Source: Upwork.

is manually searching their platform of choice to see which crowdworkers are most successful, in terms of their feedback ratings, jobs completed, money earned, skills they have and how they market those skills on their profiles. Crowdworkers then seek to emulate these successful practices, updating their profiles to highlight currently profitable skills. These are skills they already have or are in the process of obtaining, or which they believe they can develop on the job.

#### 3.2.2. Recommending training courses

Besides listing in-demand skills, Upwork and other platforms also list relevant training courses from online learning platforms that their crowdworkers could potentially use to develop their skills (Figure 16). In some cases, these recommendations amount to commercial partnerships between online labour platforms and learning providers; these are contractual relationships where the platforms earn commission in return for referring workers to the learning providers. As an example, PeoplePerHour has been in a commercial partnership with the online learning provider Skillshare since 2016. PeoplePerHour curates lists of courses on Skillshare that it recommends to its crowdworkers (Figure 17) (6). These lists are categorised by skill, such as search engine optimisation, or sector, such as marketing. If crowdworkers take a course recommended by PeoplePerHour, Skillshare offers a 30% discount to them (7). On its website, PeoplePerHour tells its crowdworkers that Skillshare is 'an online learning community' that 'works just like Netflix' to provide 'bite-sized short video sessions to fit your schedule'. Crowdworkers get a certificate for passing these courses, which they can then display on their PeoplePerHour profile.

## 3.2.3. Facilitating peer-to-peer learning

Most online labour platforms provide formal and informal opportunities for communication between crowdworkers and between them and clients. Upwork provides a 'community forum'

<sup>(6)</sup> https://www.skillshare.com/lists/PeoplePerHour/69

<sup>(7)</sup> https://blog.peopleperhour.com/blogroll/partnership-skillshare-get-3-month-free-membership/

sкill sнare.	Browse ~	What do you want to learn today?
	PeoplePe	rHour Follow
	Check out some great cl your XYZ skills.	asses curated by PeoplePerHour to help you improve
	SK, Curated by Skillsh	nare
		Mastering Illustrator: 10 Tips & Tricks to Speed Up Your Workflow
	MASTERING USTRATOR 10 TIPS & TRICKS TO J DU YOUR WORKFLOW	DKNG Studios
		48,964 Students • Illustration
	Original	Circular Logo Design with Draplin: Combine Type & Icons in a Classic Shape Aaron Draplin
		30,508 Students • Graphic Design

## Figure 17. PeoplePerHour's partnership with Skillshare

Source: PeoplePerHour.

(Figure 18). The main exception to this is Amazon Mechanical Turk, a microtask platform that does not provide a means for workers to see or communicate with each other.

Interviewees from the stakeholder organisations cited these forums as opportunities for crowdworkers to exchange skills and training assistance. Worker interviewees offered a more measured assessment. Some platform forums were perceived as well-designed, and they were sometimes used to look for answers to frequently asked questions. However, most interviewees preferred to use forums and online communities not affiliated with online labour platforms, or to not communicate with other crowdworkers at all. Other workers were often perceived as competitors, leading to the perception that 'most of the times they won't help you to learn new skills'. Online communities not affiliated with platform companies in which crowdworkers can find peer support typically include Facebook groups, Reddit subreddits, Slack workspaces and online forums dedicated to freelancers. Some specifically target 'digital nomads' and specific skill sets, such as particular software development technologies (Figure 19).

Platform companies also make some efforts to support local, on-site networking and peer learning between crowdworkers. As an example, Fiverr offers its crowdworkers a community fund: those willing to organise events can obtain funding to pay for room hire, refreshments and resources so that Fiverr crowdworkers can meet, socialise and exchange experiences and skills during workshops. Fiverr calls these workshops 'levelling up' events and they are run by 'training leads' (<sup>8</sup>). Similarly, Upwork facilitates 'huddles',

## Figure 18. Example of discussions on Upwork's community forum



Source: Upwork.

Figure 19. Advice on Reddit for crowdworkers

😚 reddit		Q Search r/Upwork			LOG IN	SIGN UP	1 .	i.
	* 0 *	Posted by u/thehandwowpack1dey ago 5 Soft Skills That EVERY Freelancer Needs medium.com/@Bount ©	About Careers Press	Advertise Blog Help	The Reddit App Reddit Coins Reddit Premium Reddit Gifts			
	* *	Source of the second seco	© 2	Content Policy   P User Agreement   019 Reddit, Inc. Al	rivacy Policy Mod Policy I rights reserved			
	+	more points  4 Comments A Share Save *** Posted by u/ClassicPurist 2 days ago						
	+	Copy Web Design by Reverse Engineer						
		Web Design           Posted 41 minutes ago           #: Specialized profiles can help you better highlight your expertise when submitting proposals to jobs like these. Create a specialized profile.           Only freelancers located in the U.S. may apply.		BACK TO	тор			

Source: reddit.



## Figure 20. Example of platform as online learning provider

Source: Learn from Fiverr.

defined as 'independently organised meetups, hosted by experienced top-rated freelancers for the local Upwork freelancer community' (<sup>9</sup>). Although huddles are primarily social events, they are opportunities to exchange learning.

## 3.2.4. Providing a training marketplace

Fiverr's new Learn from Fiverr initiative effectively introduces Fiverr as a new player in the online learning provider market (Figure 20) (<sup>10</sup>). Launched in summer 2018, it is a platform where crowdworkers can teach skills to other crowdworkers, who are then expected to sell those skills on the Fiverr platform. Fiverr representatives told us that they surveyed their crowdworkers about their skills needs and found that they were dissatisfied with current provisions on other learning platforms, including free resources on YouTube. Learn from Fiverr was created as a response to this need.

Learn from Fiverr uses Fiverr's marketplace interface to connect crowdworkers looking to develop a new skill with other crowdworkers on Fiverr able to provide training in that skill. Crowdworkers search for a skill and Fiverr produces a list of other crowdworkers able to offer training in this skill, including their rates. For skilled crowdworkers, this can be a way to scale up their earnings from the skills they possess.

(10) https://learn.fiverr.com

<sup>(9)</sup> https://community.upwork.com/t5/Upwork-Events/bd-p/Upwork\_Events

Fiverr's business case for Learn from Fiverr includes outsourcing skills tuition to crowdworkers on its platform and taking a commission for any subsequent transactions. An executive from Fiverr told us he believed the Learn from Fiverr was a cheaper alternative than other skills providers and that crowdworkers who trust the Fiverr brand would be more likely to look for training provided from other Fiverr crowdworkers. In addition, because it facilitates transaction between two crowdworkers, Learn from Fiverr does not compromise freelancers' legal status as self-employed or Fiverr's status as employer. As an incentive, new crowdworkers taking a course on Learn from Fiverr get a ranking boost on its market.

As of July 2019, Fiverr reports around 20 000 courses taken on its platform. Three of the crowdworkers interviewed for this study mentioned using Learn from Fiverr as part of their approach to skills development. Their comments suggested that Learn from Fiverr had the potential to be a useful resource and that the model of recruiting experienced, highly rated crowdworkers as teachers was a good idea. However, the comments also suggested that Learn from Fiverr was still in the early stages of ironing out issues of course quality ('I was expecting more, to be honest'), specificity ('very basic'), and relevance ('I wasn't very satisfied with it and I think then I lost interest in Learn on Fiverr'). Since the system is new, there is little accumulated customer feedback to distinguish high-quality courses from less developed ones.

Crowdworkers are very focused on the return on their investment, both in terms of time and money. This means that courses need to be worth the cost of their time and – if there is a fee – worth enough to recoup the fee and more. However, they are not opposed to paying money for a course if they believe it to provide enough value. At the time that the crowdworkers were interviewed for the CrowdLearn study, they still saw other options as better value, including some established online learning providers.

Despite these criticisms, Fiverr's crowdworkers do see the potential for Learn to improve their skill development and their profitability. All three of the Learn from Fiverr users shared their disappointment that they did not receive an award or other badge on their profile after completing their course, which they hoped would prove they were proficient in the skill for which they studied. They noted that external companies (MOOCs) also do not offer similar credentials compatible with the crowdwork platforms they use. However, since Learn from Fiverr is part of Fiverr, they considered it as obvious that skill certification from Learn from Fiverr should be integrated into their platform profiles and that this would be a particularly useful feature in the future.

While MOOCs were also seen as failing to provide specialised courses in skills that crowdworkers found relevant to their work, in general they provide courses in a wider variety of skills than Learn from Fiverr. However, the Learn from Fiverr users that were interviewed were clear that several larger MOOCs have existed for several years and therefore had time to develop more content and hire more staff. If Learn from Fiverr capitalises on the expertise of the crowdwork instructors, they may be able to offer the more specialised skill training opportunities that MOOCs may not be able to provide.

Both users of Learn from Fiverr and the other crowdworkers we spoke to were concerned in general that online learning (as well as crowdwork) was not a familiar concept in their country and so they were underutilised:

'I think there are plenty of courses online, but people don't know that. At least here in Italy, we Italians don't have the culture to learn online.'

This is a potential area of growth, both for informal online learning providers such as Learn from Fiverr and for individuals (both experienced crowdworkers and those new to this type of work) to acquire and develop new, economically viable skills. CHAPTER 4.

# How platform markets match skills supply to demand

Once crowdworkers have acquired skills, they must find clients who will pay them to put those skills to use. Conversely, clients must find crowdworkers with skills that meet their needs. In conventional labour markets, there are institutional support mechanisms such as publicly regulated systems of gualifications intended to reduce search costs and help match skills supply with demand. In online labour markets, a variety of different mechanisms are used. This section describes how and to what extent platform markets promote effective utilisation of crowdworkers' skills, examining in particular the non-formal and informal certification practices and other types of support for skills matching (RQ4b). The findings are based on a review of platform websites and press releases, as well as interviews with representatives of multiple stakeholders: platform companies, platform clients, labour unions, independent worker associations, learning providers and policy-makers. The evidence from the CrowdLearn interviews and survey of crowdworkers is also used to triangulate the findings and add detail from the workers' perspective.

Different platforms have different methods of matching clients looking for skills and crowdworkers able to provide them. The basic element common to all crowdwork platforms is a worker profile to which information concerning him/her is attached and which is searchable by clients. The profile specifically displays feedback information from the workers' previous interactions with clients. Some platforms also allow crowdworkers to upload and display skills certificates in their profiles. Together, these advertise the worker's skills and competences to prospective clients. Platforms also control the supply of skills on the platform, for instance by vetting new freelancers for basic skills in maths and English.

# 4.1. Mechanisms for matching skills supply to demand

## 4.1.1. Skills matching advice

Many platforms publish advice for crowdworkers on how to maximise their chances of attracting clients and winning bids for projects. Twago's *Ultimate guide to being a freelancer*, for example, offers advice to freelancers to acquire and utilise their skills on its platform (Figure 21). Each platform provides an interface and search capabilities to enable crowdworkers to access its database, look up and tag skills and add these to their profile. The platforms help by putting these skills into categories or domains and by offering advice to crowdworkers to tag their own skills, use tags to find work and generally maximise their skills matching through search.

4.1.2. Tagging, labelling and categorising skills The platforms we examined enable crowdworkers to tag, label and categorise their skills. These are mechanisms for crowdworkers to self-describe their skills in accordance with those the platforms have identified as existing on their system through an analysis of profiles and the skills requirements that clients post (Figure 22 and Figure 23). For instance, they enable crowdworkers to select their level of expertise (entry, intermediate, expert) and to identify the key work categories and services they can offer that corresponds to their skills and experience.

# 4.1.3. Skill micro-certification based on automated online assessment

Several online labour platforms offer crowdworkers the opportunity to gain digital micro-certificates by passing the platforms' own skill certification tests. Upwork used to offer over 300 different skill tests on topics ranging from com-

# 🗇twago Find freelancers Get started Find projects Blog twago App Working with freelancers Working as freelancers Using twago Careers About us FAO The Ultimate Guide to Being a Successful Freelancer Filed by team twago on April 29, 2015 LTIMATE GUID TO BEING A SUCCESSFUL FREELANCER How to be a Successful Working Online Freelancer Yes, this is another 'How To' article. However, if you want to be a successful working freelancer, this is the only article you need. Too many freelancers become frustrated about why things aren't working, when actually they don't even have the basic principles in place. This is your career! You need to be on top of all aspects of it to be successful, because you don't have a boss to make you accountable for your work. If you're not currently working, it can really only be due to one of three things:

# Figure 21. Twago's Ultimate guide to being a successful freelancer

Source: Twago.

munication in English to graphic design techniques and programming language expertise. Once a test is successfully passed, a digital badge certifying completion is displayed on a crowdworker's profile.

However, the efficacy of such tests in helping to match skills supply with demand seems to be limited. Upwork's representatives told us that the company's internal research found that its clients prefer to use profile introductions, portfolios and job feedback to assess a crowdworker's skills and experience rather than skills certificates alone. Other recent research suggests that skill tests are of limited usefulness in helping new crowdworkers enter the market, as they certify skills but not general trustworthiness, an attribute that is important in remote work conducted over the Internet by relative strangers (Kässi and Lehdonvirta 2019). Client feedback is seen as more helpful in this regard.

# Figure 22. Upwork's facilities for selfdescribing skills (a)

Entry level	Intermediate	Expert
I am relatively new to this field	I have substantial experience	I have comprehensive and deep expertise in this field
neid	in this neith	deep expense in ans neid
ategories		(
Categories ccounting & Consulting		
Categories ccounting & Consulting tuman Resources		
Categories ccounting & Consulting Human Resources dmin Support		ę
Categories ccounting & Consulting Human Resources dmin Support Personal / Virtual Assistant W	eb Research Transcription Other -	Admin Support

Source: Upwork.

# Figure 23. Upwork's facilities for selfdescribing skills (b)

Categories		>
What are the ma	in services you offer to clients?	
Select up to 10 catego	ories.	
Graphics & Design x	Presentations x Personal / Virtual Assistant x Transcription x	
Web Research x	Other - Admin Support × Market & Customer Research ×	
Marketing Strategy ×	SMM - Social Media Marketing x Human Resources x	
Web, Mobile & Sof	tware Dev	~
Web, Mobile & Sof IT & Networking	tware Dev	* *
Web, Mobile & Sof IT & Networking Data Science & An	tware Dev alytics	* *
Web, Mobile & Sof IT & Networking Data Science & An Engineering & Arcl	tware Dev alytics hitecture	* * * * *

Source: Upwork.

In 2019, Upwork removed most of its skill tests, pointing to the fact that skill test scores could easily be manipulated by cheating, as many answers can be found online. Upwork's crowdworkers also told the company that these skill tests – especially technical ones – quickly became outdated or irrelevant. Upwork nevertheless still offers a readiness test. People-Per-

Hour has similarly offered its readiness test since 2018. Crowdworkers on PeoplePerHour who have passed the test display a badge as evidence of completion. The exam assesses English and maths skills by asking questions such as 'What is a negative number multiplied by a negative number'? 'What is the cube root of 64'? However, videos are published on YouTube showing how to pass these tests, undermining their validity.

Crowdworkers responding to the CrowdLearn survey highlighted the low value of in-platform skills tests, with the majority taking two or fewer tests (Figure 24). Interview respondents explained that some platforms pressured new crowdworkers to take at least one test for the profile to be complete, possibly explaining why crowdworkers engaged in an activity which they otherwise saw as unhelpful for gaining new clients.

# 4.1.4. Automated ranking and endorsement of workers

Although skill tests are generally not perceived as very helpful, Fiverr representatives reported in their interview that its Learn from Fiverr courses - which come with a digital badge that certifies successful completion of the course - are popular with crowdworkers. It is difficult to ascertain if this is because the certificates obtained via Learn from Fiverr courses are valued by clients or because Fiverr takes success on their courses into account in its system of ranking workers into different levels. Workers' levels influence the order in which they appear in clients' search results, in turn influencing which workers get matched with which clients. Other factors considered by the ranking system include measures of reputation and timeliness. While Fiverr publishes lists of factors that influence the ranking (Figure 25), it is unable to disclose specific weightings without making it possible to game the system and for business confidentiality reasons.

Other platforms feature similar systems that automatically rank or endorse specific crowdworkers based on the data traces that they and their clients leave on the platform (PeoplePer-Hour's 'CERT' for instance, Figure 26). The platforms' algorithms draw on this information when selecting which workers to present or highlight Share of respondents, in %

## Figure 24. Crowdworkers' attitudes towards and utilisation of in-platform skills tests

Entire sample Sample size: N=1 001 Since joining the platform, how many free [platform] skills Sub-sample Sample size: N=516 tests have you taken? Have these [platform]-specific skills tests been required or helpful when getting projects on the [platform]? Not applicable 28 None 21 1–2 tests 25 No 64 3–6 tests **17** Yes 36 7 or more tests q Have other, non-platform specific digital/online skill tests and certificates been required or helpful when getting projects on [platform]? 74 No Yes Source: Cedefop CrowdLearn data set.

# Figure 25. Crowdworkers' priority placement factors in search results on Fiverr

TOP	Top Rated Seller	Overview
		This elite group of Sellers enjoy a growing number of exclusive benefits, as they continue on providing Buyers with an overall excellent experience. Please note that this is a manual process - once you meet the following requirements, we will look back on your performance. Once our team confirms your eligibility, you'll be ranked as a Top Rated Seller.
		Requirements
		Complete at least 180 days as an active Seller on Fiverr
		Complete at least 100 individual orders (all time)
		Earn at least \$20,000
		Maintain a 4.7 star rating over the course of 60 days
		90% Response rate over the course of 60 days
		90% Order completion over the course of 60 days
		90% On-time delivery over the course of 60 days
		Avoiding receiving warnings over the course of 30 days

Source: Fiverr.

# Figure 26. PeoplePerHour user interface displaying a worker's CERT ranking level



NB: CERT = community, engagement, repeat usage, trust. *Source:* PeoplePerHour.

to clients. A degree of machine learning can be involved, such that the system learns to recommend workers to clients based on the success of previous matches; however, for the most part, the algorithms still appear to be quite rule-based.

# 4.1.5. Externally obtained skill certificates on workers' profiles

All the platforms in our study enable crowdworkers to display their photograph, reputation ratings, client feedback, education, list of skills and skill certificates on their profiles. Certificates are documents that show a crowdworker has completed a course or passed a test. These can be external certificates awarded by training institutions or companies and validated by official bodies, intended as a signal that these skills are genuine and have been officially assessed.

On Upwork, Fiverr, and PPH's crowdworker profile page, certificates are listed at the bottom, which suggests they have less relative value than other signals of professionalism and trustworthiness, such as buyer feedback. Twago is distinctive because its profile page allows freelancers to upload PDFs of their certificates to help validate the skills they claim to have (Figure 27). There is no facility to do so on the other platforms examined. Unlike Upwork, PPH, and Fiverr, certificates on Twago's crowdworkers' profile page do not have their own section or panel.

# 4.2. Managing the entry of new skills into the platform

Platforms are perceived as being open marketplaces that passively host any worker wishing to offer their skills for sale. In practice, platform companies are increasingly proactive in managing what kinds of workers and skills are entering their pools of available talent. They do so by both restricting entry for some crowdworkers and attracting others via advertising and similar means. Upwork, for instance, vets new freelancers by assessing their skills and experience against the levels of demand on its platform. Figure 28 presents an email from Upwork explaining its decision to reject a new crowdworker, which includes advice for getting accepted next time. As a test, the CrowdLearn project team submitted three real profiles, accurately reflecting the work experience and skills of some of the team's researchers, to Upwork that were heavy on skills the platform had listed as being fastest-growing in demand. All three profiles were rejected, with the stated justification being that 'at this time there are already many freelancers with a similar skillset to yours and we cannot accept your application'.

Experienced crowdworkers in the project interviews also noted that they had recommended using Upwork and other platforms to friends and colleagues, only to have them struggle to be accepted into the platform. The crowdworkers interviewed noted that they had not faced the same difficulties getting started themselves in prior years, suggesting that the bottleneck to success may be moving from gaining clients to gaining entry into the most desirable platforms in the first place. This could be due to the number of registered workers on the platforms growing faster than the number of clients. The interview findings must be interpreted with caution,

Add image								#1 view
		United	Kingdom				Available: imm	nediately 🗾
	0.3	0	©0	0 3		2		
	© 0 € / hr		Evaluations i	revenue	Languages	<u>.</u>	My public	c profile
	My hourly r	rate					Request ve	enfication
Skills overview	A	bout						
							Upgr	ade
							PD	F
Portfolio							PD documents	F sUpgrade
Portfolio	olio item						PD documents	F sUpgrade
Portfolio Add portfol Skills Web & Programm	olio item	٥	Design & Mec	tia		Sales a	PD documents	F sUpgrade
Portfolio Add portfolio Skills Web & Programm	olio item		Design & Med	tia	0	Sales a	PD documents	F sUpgrade

Figure 27. A crowdworker's profile on the Twago platform

Source: Twago.

# Figure 28. Rejection email from Upwork

Thank you for submitting your application to join Upwork.

As we do with everyone who wishes to join Upwork, we carefully reviewed your profile to determine whether there is sufficient need for your skills and experience in the marketplace. Unfortunately, at this time there are already many freelancers with a similar skillset to yours and we cannot accept your application.

I know this news is likely disappointing to you. However, we want to make sure the freelancers we accept have the best chance at success on our platform. This requires us to not only closely review a freelancer's talents and experience, but also balance those with the availability of projects. For example, at times our marketplace may have too many freelancers with similar skills competing for the number of projects that are available. To avoid the frustration that goes along with that, we must limit the number of new freelancers that can join our website. While you cannot submit proposals for jobs right now, the number of available jobs and freelancers vary throughout the year. We can offer a few suggestions for going forward:

- 1. If you have more relevant skills or experience to add now or in the future as you develop them, you can update and re-submit your application and we'll take another look to see if there is a demand for your new skills.
- 2. If you haven't already, you can learn more about building a complete profile by checking out the following articles:
  - Enhance Your Upwork Freelancer Profile for Greater Success & Sample Profiles

For more details about applying to join Upwork, please click <u>here</u>. Thanks for your interest in Upwork!

Regards,

Source: CrowdLearn project team.

as the sample, by definition, consists of people who successfully entered the platform. All the platforms examined also continue to advertise their facilities to crowdworkers. In specific instances, some platforms will use advertising to fill skills gaps in its talent pool. Twago reported, for instance, that it would proactively seek some specialist skills to satisfy demand on its Enterprise platform.

Once accepted onto the platform, crowdworkers settle into a loose and constantly evolving hierarchy of workers. Those with both desirable skills to sell and the skills necessary to market them effectively on the platform gain more work and better ratings, leading to in-platform badges such as 'top seller'. Those with less in-demand skills, who struggle to market themselves, who only use the platform infrequently, or who otherwise do not frequently win jobs on the platform, do not gain these badges. This means they may be filtered out by clients looking for suitable crowdworkers. Upwork's in-platform search engine, for instance, allows clients to filter out crowdworkers with low ratings, few jobs, low earnings, or without the 'top rated' badge. Nevertheless, while platforms - and some more than others - make an effort to regulate their skills ecosystem, there is still a wide range of crowdworkers participating in most platforms, from occasional hobbyists to career freelancers and well-known professionals.

# 4.3. Effectiveness of skills matching in platform markets

How well do the mechanisms described above help to match skills supply with demand in online labour platforms? Crowdworkers interviewed did not always feel they are using their full set of skills in their work. This is because the work available was often lower skilled and they took the task or project because they needed the money, particularly when they were newer to the platform and needed to develop a portfolio of in-platform work and accrue positive client ratings. Crowdworkers might have also purposefully selected a task or project that underutilised their skills because they found the project interesting, it was in a new skill area they wanted to move into, but needed more proof of their ability to do it on their profile, and/or they wanted to reduce their work/ stress load, while remaining active on the platform and earning some income. This speaks to the diversity of motivations among people engaging in crowdwork.

Some platforms also allow clients immediately to hire a crowdworker for a project without the worker first approving the exact details of the work to be carried out. This means that, sometimes, crowdworkers are hired for a job they cannot actually do, resulting in them having to cancel the job. Cancellations on these platforms reflect badly in crowdworkers' in-platform rating, meaning that this imperfect method of semi-automated skills matching unequally negatively impacts crowdworkers when a client makes a mistake.

Crowdworkers praise platforms' job search and browse functions but are critical of the quality of the job postings themselves. Their main complaints are that clients use irrelevant skill tags on job postings - meaning that search results are flooded with jobs irrelevant to the workers - and that clients often do not know what it is they want or need, leading to inaccurately or vaguely worded job descriptions (Eurofound, 2018). Beyond wasting crowdworkers' time, these issues are also highly problematic in platforms that limit the number of jobs a worker can apply to per month (or that sell extra application 'credit'). Poorly written job postings lead crowdworkers to waste their limited applications on undesirable and even unfeasible work opportunities, limiting their chances of finding relevant and (both financially and developmentally) rewarding work.

CHAPTER 5.

Share of respondents, in %

# The challenge of inter-platform skills portability

The main mechanisms that platform markets provide for workers to signal their skills – feedback from previous clients and skills tests – are tied to specific platforms. As a result, workers are unable to transfer the evidence of skills acquired on one platform to another. This potentially limits workers' mobility and ability to move from less to more specialised platform work as their skills develop. The lack of portability also potentially limits the ability of other stakeholders, such as learning providers and unions, to get involved in skills matching, as the forms of skill validation they provide are not widely used by platform clients. In this section, we describe findings concerning the challenges of facilitating inter-platform recognition and portability of crowdworkers' skills and their respective signals (RQ5).

# 5.1. The case for portability

The CrowdLearn evidence suggests that a significant proportion of crowdworkers are active across platforms, making skills portability an issue of importance. Two thirds of respondents to the CrowdLearn survey indicated that they previously earned income from sources other than the platform in question (Figure 29). A third of crowdworkers who completed the survey are active on

## Figure 29. Crowdworkers' use of multiple platforms



### Figure 30. Crowdworkers' portability across platforms

#### Share of respondents, in %

I could easily switch to another platform without negatively impacting my income  $N\!=\!530$ 



Source: Cedefop CrowdLearn data set.

several of the four target platforms, Fiverr and Upwork being the most common combination (9%).

Currently, workers using digital platforms are unable to take any proof of skills acquired using one platform, including their reputation feedback, to any other platform or job market. This means for example, if a freelancer has a Top CERT status on PeoplePerHour, they could not transfer this evidence of a skill to another platform. Freelancers signing up to new platforms can typically attach any information they like to their profiles, in some cases including copies of certificates earned from learning providers. But they cannot transfer any client feedback or other signals and evidence from another platform that would 'validate' the information they have supplied, in the sense of providing independent proof of it. As one stakeholder put it, 'A [worker] can show their skills and formal education anywhere, like on LinkedIn. All the relationships that [workers] build through the platform economy can't be shown anywhere else other than the platform on which they were achieved'.

Crowdworkers interviewed for this study are keen to see more inter-platform portability of reputation and skills ratings. The lack of such interoperability makes some workers feel trapped in a particular platform, as moving to a new platform would mean they would be seen by clients as unverified, risky hires. In the CrowdLearn survey, 57% of (a valid subset of) respondents strongly disagreed or disagreed that they can easily switch to another platform without negatively affecting their income (Figure 30). This led some of the crowdworkers interviewed to say they continued to work on platforms for a long time beyond when they first wanted to move on, due to changes in platform fees, platform operability and availability of relevant jobs. Portability could thus unlock greater mobility, possibly helping workers to put their skills to better use and move up towards more specialised work.

However, since inter-platform portability remains for the most part only an idea, there is little evidence on what the actual impacts would be. Some experimental evidence suggests that inter-platform portability of reputation information can help users to successfully enter into new platforms where they lack a previous track record, provided there is a good 'source-target fit' between the platforms (Teubner et al., forthcoming). In the case of a bad fit, such as a food delivery driver attempting to use their food delivery feedback to gain projects on a software development platform, the effects of portability can be negative. Further, if users are allowed to exercise discretion over which feedback information to import into a new platform, this could potentially reduce clients' trust in the feedback as a signal, because they would know that it is, to some extent, cherry-picked. The actual effects of portability remain unclear, but it is unlikely to be a silver bullet that solves issues of platform dependence and mobility in one stroke.

# 5.2. Challenges in achieving portability

To achieve portability of skills signals between platforms in practice, several challenges have to be overcome. Organisations working on facilitating inter-platform recognition and portability of skills highlight the following:

- (a) the technical know-how and capacity to define a skills framework;
- (b) the ability to translate this into technical architectures;
- (c) the means to broker cooperation with platforms;
- (d) the ability to manage competing interest groups;
- (e) the expertise to navigate the legal constraints;
- (f) the power to coordinate the project across European states;
- (g) clarification of the implications of GDPR.

In the following subsections, we discuss some of these issues in more detail.

### 5.2.1. The lack of a business case

Research on platform strategy suggests that interoperability is generally not in the business interests of the market leader, as it could make it easier for competitors to gain market share (Shapiro and Varian, 1999). Conversely, challenger platforms are more likely to be interested in interoperability schemes. The platform economy as a whole consists of dozens of online labour platforms, but only a handful of them command the majority of the market share (Kässi and Lehdonvirta, 2018). For an interoperability scheme to have meaningful coverage, it would require the participation of these leading platforms, but they have the least incentive to do so.

One of our stakeholder informants is a Danish tech start-up (Deemly), whose services are designed to facilitate trust across peer-to-peer marketplaces, by allowing clients and crowdworkers accumulate and transfer their digital reputations between platforms. Deemly believes that people will be more inclined to try out new platforms if they can bring their reputations with them. Similarly, less active users of more established platforms will be able to participate more when they can utilise their entire digital reputation portfolio to compete with the platform's most active users. Without some more pressing reasons, it may be difficult to recruit larger platforms to open up worker profiles. Over the past decade, many start-ups besides Deemly have attempted to create reputation aggregation and interoperability schemes for different kinds of platforms and services, but none have taken off so far.

#### 5.2.2. The fluid nature of skills ontologies

Another requirement for a skills portability scheme is consensus on which skills should be recognised. Some skills are stable while others are in flux and constantly being redefined. Many skills are only recognised indirectly or tacitly, such as etiquette, grammar, and spelling. The online platform market in many areas is highly specialist and fragmented.

A methodology would be required to determine which skills are transferable and which are more context-specific. Because it may run counter to the fragmentation inherent in the crowdworker market, formalising this distinction is difficult. Such a methodology would have to feed into a comprehensive model or ontology of skills in crowdwork and freelancing. Any such system requires an agreed set of standards for skills that clients, crowdworkers, skills providers and platforms all endorse. Professional qualification bodies in nursing, accounting and other professions will likely have approaches, systems and processes that can be used to this end, or they may be adapted or used as guidance, rather than directly copied. However, the centrality of the platforms' data practice may require some technical innovations.

The research also suggests that skills recognition systems in online labour markets would not be effective without accounting for other signals of employability (such as reputation) which are, in the client's assessments, indivisible from skills. Skills, reputation and trustworthiness are difficult to disaggregate. As one platform client stakeholder said, a freelancer's skills are useless in isolation unless clients know they are a genuine and trustworthy person; clients will choose a demonstrably less skilled person instead of someone whom they are not sure they can trust. Understanding of what constitutes a good reputation and trustworthiness may also vary markedly in an international context (for instance, between an Indian, US or French client), rendering it challenging to obtain a shared understanding of the value of the ratings given. Other recent research concludes that digital trust is difficult to port between platforms, because it is dependent on the specific 'mechanisms and rules implemented by the platforms (rating, screening, filtering, signalling mechanisms)' (Penard, 2019).

## 5.2.3. Technology and data access

There are also technical challenges that inhibit portability of skills across platforms. An interoperable system would require a skills vocabulary translatable into a machine-readable ontology. This translation could be done in many different ways, with many possible pathways for standards and technologies. An interoperable system will necessitate access to each platform's data, so that, for example, a crowdworker's reputation can be extracted and imported into the system whenever it is updated. To allow for such transfers, shared protocols and formats for consolidating and sharing data are required.

In some economic sectors, the platforms required to share their data are in direct competition and their competitive advantage is sustained by exclusive relationships, data property and their proprietary systems of skills identification and signalling. To cooperate in an interoperable system, platforms need to be convinced there is a business case for inter-platform recognition and portability of crowdworkers' skills. Since the platforms admitted as part of the project's interviews that they are operating successfully without such a system, setting one up will be a challenge.

Platforms would need convincing to change their terms of service to allow more data sharing between them, academia and civil society. Because they use different platforms for different reasons, some crowdworkers may also not want inter-platform recognition and portability. While models of interoperable skills recognition systems are emerging in national contexts (for example, Sweden as described further below), European freedom of movement demands a trans-European system of inter-platform recognition and portability.

One of the stakeholders interviewed is an autonomous component of Sweden's public employment service, called JobTech. Drawing on government skills and employment data, JobTech is developing data operability infrastructures and standards to allow inter-platform recognition of skills. Job Tech's goals are hindered by the lack of inter-operability standards across the digital economy; different platforms use different data standards and encode different conceptualisations and taxonomies of skills within their data models. For inter-operability to be realised, the technical challenge of harmonising these into a standard model will need to be addressed. This will require platforms to release such data for the purposes of harmonisation, which introduces concerns over whether GDPR will facilitate or constrain such data sharing.

## 5.2.4. Data protection regulation

The EU's new General data protection regulation (GDPR) requires special attention because it presents opportunities and challenges to any enterprise intending to make skills and reputation interoperable. It contains provisions related to data portability, but interpretations differ as to their practical scope and impact (De Hert et al., 2018). GDPR's implications for crowdworker skill data remain unexplored in the literature.

We asked the project informants to reflect on the impact of the GDPR on platforms for crowdworkers and whether it could help empower them through interoperable data. A senior representative of UNI Europe said this was all 'uncharted territory' and nothing would be made clear until GDPR's impact on the platform economy is tested in courts.

Deemly reported that GDPR is currently too ill-defined to be useful to the company. Article 20 of GDPR states that companies should allow users to access their data in a machine-readable format but it is unclear if this is enough to push platforms to open up their data to third parties. Also if platforms are mandated to open-up their APIs (application interfaces used by third parties to access data stored by platforms), it is too easy for platforms to innovate around the law. Some platforms slightly alter their APIs every month. Therefore companies wanting access to the data must devote valuable resources to synching their systems with the platform's API.

However, for Deemly, GDPR has produced a shift already. The company has been using the affordances of GDPR to 'drive the conversation' about access rights and helping to convince platforms to open up. Deemly argues that recent well-publicised data scandals and the subsequent focus on data ethics have also been important to these discussions. It is now possible to advise online labour platforms that much of their data belongs to their crowdworkers and, from an ethical and GDPR standpoint, they should therefore allow these users to access their data, delete it, and take it with them. CHAPTER 6.

# Conclusions and reflections for policy and further research

This section draws on evidence from Cedefop's CrowdLearn research to identify opportunities for potential policy interventions that could improve skill development and matching in online platform work (RQ6). From a crowdworker perspective, the need for such interventions is highlighted by the fact that in the CrowdLearn data set more than 60% of valid survey participants strongly disagree or disagree that national governments support freelancers.

The discussion below, therefore, considers the implications of the key findings of this study and attempts to infer possible policy avenues and actions (Sections 6.1 through 6.4) and further research (Section 6.5) that could aim to improve skill development and skills matching in online platform work. The section is structured around four key thematic areas cross-cutting the stakeholder groups: labour market integration; initial education and vocational training; continuing professional development; and skills matching (Figure 31).

# 6.1. Platform work and labour market integration

# 6.1.1. Overcoming entry barriers for newcomers via 'subsidised micro internships' and 'pre-rating' skills validation in online platform work

Platform work is frequently seen as a tool for labour market integration. However, new crowdworkers face difficulties breaking into the market because they lack client feedback, which is the primary means of signalling skills and trustworthiness on platform markets. Research suggests that this results in inefficient utilisation of workers' skills (Pallais, 2014). To address this deficiency, and to help promote crowdworkers' skill development, platform companies and policy-makers could collaborate on developing an experimental programme of 'micro-internships'. In such a programme, platform clients are offered a subsidised rate for crowdworkers who lack previous platform-based work experience. In exchange, clients are required to provide the workers with constructive formative and developmental private feedback that helps them develop their skills and public feedback (<sup>11</sup>), in turn signalling their skills and trustworthiness to other potential clients.

Such micro-internships could improve on a practice that is already informally used to some extent in the online platform economy. More than 70% of crowdworkers in the CrowdLean survey stated that they have been hired for a small test project by clients to evaluate their performance, before being hired for a larger project. Micro-internships would improve on this by making the feedback from the test projects available to other clients, by opening the scheme to new workers and by including a skills development aspect. Experimentation would be needed to determine if and how clients could be convinced of a business case for such an approach or what level of subsidy would be required to offset the additional costs to employers.

Ideally, public feedback should be portable across platforms. Alternatively, if the feedback is tied to a platform, then the platform should have an incentive to participate in subsidising it. However, as with all subsidised employment programmes, it will be crucial to set limits on the use of micro-internships so that they are not exploited by clients looking for cheap labour and hence accentuating existing disadvantages faced by online platform workers, such as unpredictable pay, race to the bottom due to global competi-

<sup>(&</sup>lt;sup>11</sup>) Although what constitutes such 'developmental' feedback needs to be firmly defined and may be open to manipulation by some platform clients.

**Potential policy actions** 

Research questions	Key insights
Skill formation	A set of core/technical, professional and digital skills as a pre-requisite for platform work
and learning processes	Once 'online', crowdworkers report frequent skill development with learning needs intertwined with 'just-in-time' client demands
	Crowdworkers undertake a wide range of self- initiated workplace learning activities and self- regulatory learning (SRL) strategies
Stakeholder support in skill development and	Platforms support learning indirectly through 5 key mechanisms: publishing data on skills; referring workers to skill providers; eliciting clients' feedback on workers' performance; facilitating peer-to-peer learning; providing training marketplaces
matching	Crowdworkers report varying levels of perceived usefulness with concrete improvement opportunities
	Mechanisms for matching skills supply to demand include matching advice, standardisation of skills, internal/external certification, ranking/endorsement and regulation of entry
Inter- platform	Skills matching mechanisms in platform work e.g. client feedback is largely platform-specific
skill portability	As a result, worker mobility is limited and possibly resulting in skills underutilisation
	Portable portfolio functions as a solution face significant obstacles (e.g., perceived lack of business case, data protection regulation, evolving skills matching technologies)

# Figure 31. Potential policy action areas to improve skills development and matching of online platform workers

Policy

dimensions

Experiment with subsidised Labour market 'micro-internships' in integration platform work Online platforms or 3rd neutral party develops a 'pre-rating' skills validation system Continuing VET providers to consider professional offer of short online courses development and workshops that meet crowdworkers' 'just-in-time' learning needs Education Focus on developing peoples and self-regulatory learning skills, vocational capabilities and mindsets training Continued focus on digital and enterpreneurial skills in formal education Skills Consider adopting portable matching portfolio functions to allow workers to display/advertise/ transfer qualifications/ experiences/ratings/ reputations Engage with platform companies to examine ways of overcoming obstacles to cross-platform portability

Source: Cedefop CrowdLearn data set.

tion and faceless service provision, and unpaid search time.

As part of their education policy, governments could formalise, fund, assess and monitor apprenticeships for freelancers and integrate them within existing schemes that are often incentivised through tax breaks.

An alternative proposal to overcome the entry barriers faced by first-time or inexperienced crowdworkers is to operationalise a 'pre-rating' skills validation system, either through the online platforms themselves or a neutral third party, giving newcomers a starting point in terms of reputation based on their educational attainment, work experience and completed skills assessments.

# 6.1.2. Improving information flow to crowdworkers on country-specific procedures related to platform work

Crowdworkers require clear instructions and other educational materials on taxes, business registration, social welfare implications and related government processes in each country and region, as well as across borders, that can enable them comfortably to navigate the legality of their work status (<sup>12</sup>). Governments could also provide clear instructions on how crowdworkers could deal with disputes with platforms when concerning their rights *vis-à-vis* the platform. This also involves recognising this new form of work in official government documentation. If platform work is not properly integrated into existing legal and administrative frameworks, it risks becoming a new shadow economy.

# 6.2. Platform work and initial vocational education and training

# 6.2.1. Developing self-regulatory learning skills, capabilities and mindsets

Successful crowdworkers need robust skills and dispositions developed through initial vocational education and training and prior to entering working life. Self-regulatory learning skills and mindsets (SRL) are particularly critical for both online and offline work and are best developed from early childhood, and certainly before entering work, where a lack of self-regulatory ability is less tolerated and could have a negative impact on an individual's early career. SRL is a fundamental skillset in the 21<sup>st</sup> century. Such skills include the ability to be strategic and dynamic in identifying one's own learning goals, maintaining a lifelong learning orientation, continuously studying the market to understand and identify changing skill requirements, strengthening one's own personal self-efficacy, being proactive in seeking feedback and being self-reflective and able to dynamically change one's learning strategies when these are not working. These attributes are, and will continue to be, increasingly required of every worker, not just those in highly skilled or managerial jobs.

The Cedefop CrowdLearn study discovered that people who are highly self-regulated learners – as measured by their self-regulated learning disposition score in the questionnaire – engage in learning and skill development on average on a weekly basis, while those with a low self-regulated learning score do so only occasionally. New crowdworkers must have a baseline level of self-regulatory learning skills in order to win their first gigs or projects.

Some elements of these skills, particularly where specific techniques are concerned, can be taught in a classroom; for example, planning and prioritising learning goals or techniques and tools to support systematic self-reflection such as through writing. Integrating entrepreneurship education across different subjects is also a way to support young crowd workers. Education institutions could make entrepreneurship education part of school plans and focus on teaching young people about business plans, rules and regulations and let them try to set up their own 'mini-company' during compulsory education to explore all the elements of being self-employed.

However, self-regulatory capabilities are strongly developed through trial-and-error, deliberate practice, mimesis, reflecting on one's own and other's errors and learning from mistakes. This comes through experience and practising self-regulation, self-direction and self-reliance every day across different contexts in one's life course.

Education institutions, including kindergartens, primary schools, universities and vocational training colleges, could help people develop self-regulation, self-direction and self-reliance through designing educational experiences and learning events in such a way that the self-regulatory capabilities are encouraged, fostered and rewarded. This requires helping people to help themselves, while providing the necessary scaffolding and expert guidance but planning for gradual removal of these as the individuals become more confident in exercising their acquired capabilities. In the workplace, indirect forms of support for the development of these skills - for example through job design, workflow design and, in platform workplaces, interface design can be more effective and more appropriate for adult professionals than direct training could be. Examples of such mechanisms evidenced in the CrowdLearn study are publishing data on

<sup>(12)</sup> For instance, existing entrepreneurship education programmes such as the JA Company Programme (http://coyc.jaeurope.org/ about/ja-company-programme.html) and JA Start-Up Programme (http://eec.jaeurope.org/jaeec18/ja-start-up.html) cover such elements for age groups between 15 and 29 years. In addition to the authorities, the role of business associations in providing such information is also very important.

skill demands, referring workers to learning providers, eliciting client feedback on worker performance and facilitating peer-to-peer learning through online learning marketplaces.

# 6.2.2. Digital skills and competences as priority in initial vocational education and training

Although successful crowdworkers continue to learn new skills via on-the-job learning, they experience less frequent skill development in digital skills relative to other skills. Digital skills are mostly developed before entry into crowdwork. In countries where crowdwork is less common, stakeholder interviewees argued that this was partly due to a lack of digital skills. Crowdwork is not a solution to improving digital skills and it is imperative that initial education and training systems continue to focus on the development of key digital competences and digital literacy as a priority area.

An interview participant representing the OECD reported that 'where we test people on their digital skills, we're always shocked by how low these skills are', and 'certainly there may be opportunities to help people access some of these jobs by training them in digital skills'. Digital upskilling programmes could adopt a more holistic approach, such as providing guides to freelancing, educating young people about the risks and opportunities involved in freelancing, platform business models and the broader issues and opportunities associated with being self-employed, so that they may make informed career choices.

# 6.3. Platform work and continuing professional development

# 6.3.1. VET provider relevance to 'just-in-time' learning needs

People who have successfully entered crowdwork find that on-the-job skills development is an essential part of all types of crowdwork. Almost 60% of the crowdworkers surveyed developed their skill set at least weekly. As in all workplaces, in platform work learning needs are closely intertwined with task requirements and driven by clients' priorities and requests. Crowdworkers already have a baseline level of saleable skills and professional 'soft' skills and hence look for short, focused, online courses and tutorials, typically to acquire or improve specific skills within the domain in which they already work. They tend to gravitate towards YouTube tutorials and Google – which are free and fast – when learning and searching for new information. By contrast, the Cedefop's CrowdLearn study detected that crowdworkers considered MOOCs to be too long, too broad and to be covering disproportionately many introductory-level skills.

VET providers could explore the option of partnering with platforms to develop mutually beneficial arrangements and design short online courses tailored to (potential) crowdworkers' learning needs, similar to PeoplePerHour's partnership with Skillshare (outlined in Section 3.1.1). Learning providers could also consider whether their current fee structure is sustainable, as advertising-supported free content becomes normalised across the Internet, including in the online learning marketplace. The proliferation of new and different forms of informal learning and (digital) microcredentialism in the online platform economy poses a significant problem for existing skills validation processes and the overall relevance of formal qualification and training systems and is anticipated to continue to do so in the future.

# 6.3.2. Strengthening trade union support to crowdworkers

Trade unions play a significant role in the continuing learning of workers in traditional labour markets. However, union membership among crowdworkers is rare. Only 8% of Cedefop's CrowdLearn survey respondents are members of an association or union, and in less than half of the cases is the membership related to their online crowdworking activities. As one informant observed, 'unions really have a hard time getting people together' and the relevance of unions is not clear to platform workers. This may be because of fragmentation in platform work, its international character or because some crowdworkers do not consider their engagement in platform work as sustainable employment (Eurofound, 2018).

However, some trade unions have a tradition of supporting the training and development of freelancers through, for example, certifying training courses, providing workshops and curating resources for trainees who are looking for trusted pathways to a career in freelancing. Unions could adapt and transfer these existing provisions for online freelancers, who would benefit from access to low-cost, high-quality provision. Through such training-led interventions, unions could start reaching out to online freelancers and use the opportunity to engage with them more broadly. It is recognised, however, that in addition to issues of union affiliation and coverage, the effectiveness of such actions will depend on country- and union-specificities and legal frameworks.

## 6.3.3. Improving feedback loops between clients, platforms and crowdworkers

Platform companies could indirectly offer more support for crowdworker on-the-job skill development through better guiding clients. There are several ways in which they could do this. First, they could provide clearer and more structured guidance to clients on how to communicate needs and expectations to crowdworkers, both in their job advertisements and throughout the course of a gig or project. Platforms have recently invested in more guidance for clients in this area (such as the Upwork job templates), but the study's findings suggest that such guidance is still insufficient. The crowdworkers interviewed frequently mentioned that much of their time, as well as that of clients, was wasted identifying the clients' expectations and requirements. Similarly, almost 80% of survey respondents stated that the pace of their work is dependent on direct demands from clients. It would make platforms more efficient and improve the return-on-investment for crowdworkers and clients if the latter were incentivised to write clearer job postings. Providing more guidance would also support the individuals and small companies who use these platforms as clients but do not necessarily have the same levels of recruitment and managerial experience, training, or processes as larger firms.

Given the importance of feedback in skill development (Chapter 2), platforms could encourage clients to provide formative, developmental rather than only summative, evaluative feedback to freelancers. With more than 60% of crowdworkers being worried about the impact of unfair feedback on their future income, formative and evaluative feedback would have to be carefully distinguished. Platforms could consider providing better guidance to clients on what formative versus summative feedback looks like, particularly in the context of a client-crowdworker relationship, and how it is delivered, for instance in private versus publicly. An additional suggestion is that platforms could also consider setting up a technical facility whereby crowdworkers could evaluate and rate their clients in terms of their overall trustworthiness, cooperation, consistency, clarity of goals/communication, building up corresponding reputation scores for the latter.

# 6.4. Platform work and skills matching

# 6.4.1. Promoting a portable skills and reputation portfolio and facilitating cross-platform portability

A key value proposition of online labour platforms is that they match skilled workers with employers' skill needs. However, the matching mechanisms, such as reputation instruments that collect feedback from previous clients, are specific to each platform. More than half of the crowdworkers surveyed in Cedefop's study believe that they cannot switch to another platform without negatively impacting their income. This limits worker mobility between platforms and potentially also from crowdwork to traditional employment, possibly resulting in skills underutilisation.

Portable portfolio-based systems would enable workers to market themselves better by displaying, advertising and transferring the evidence of their qualifications, skills and work/platform experience across platforms; this would also support them in managing their learning. Gupta (2017) outlines an example of a potential portfolio-based system for crowdworkers. Policymakers, NGOs, or trade unions could mediate and work across platforms to encourage platforms to develop and adopt such portfolio systems.

Achieving cross-platform portability of crowdworker skills, work experience, client feedback, reputation ratings and similar data poses significant challenges. These include a lack of a business case for large platforms, the constantly evolving nature of skills signalling systems across platforms, hampered standardisation of taxonomies, differential technical infrastructures, and interoperability principles used by platforms and data protection regulation. Overcoming such obstacles requires continued dialogue between governments, social partners and major online labour platforms.

An alternative proposal to facilitate portability of crowdworker skills and credentials is to consider the creation of a neutral public portal where crowdworkers are offered the possibility to upload and display all of their signals of skills and performance (qualifications, micro-credentials, badges, client feedback, reputation scores, completed gigs/projects, awards). Such a platform could accompany the creation of individual online accounts that will provide a summary of crowdworkers' entire portfolio of credentials and other signals of their skills and act as a digital passport transcending platform-specific confines.

Similar initiatives have not been fully successful in previous attempts but setting up broader national, EU-wide and internationally led international standards for work in the platform economy may have a higher impact than ad hoc private initiatives. In addition to the consideration of laws and regulations, incentives (such as tax waivers) could be provided to platforms to automate the transfer of a crowdworkers' platform-specific skills information to their publicly available online account. Making the above proposal operational raises significant data protection issues, such as whether platforms can retain the intellectual property rights of workers' skills-related information once such data is made publicly available.

It is important, however, to note that the evidence concerning the effectiveness of skills portability in improving worker mobility remains limited, so achieving portability may not be the silver bullet it is sometimes hoped to be for improving mobility.

# 6.4.2. Improving skill tests and integrating external skill test results in platforms

Platform-provided skill tests certify crowdworkers' skills rather than their general trustworthiness, so they presently do little to help them achieve their first project and are also fraught with issues of lack of trust by clients, given that they can be manipulated. Cedefop's study has revealed that crowdworkers do not perceive current platform-provided skills tests on offer as useful for accurately signalling their skills, or for attracting more work from clients. Only about a third of the CrowdLearn survey respondents considered them helpful or required in being awarded projects. Even fewer considered online skills tests and certificates provided by parties other than the platforms helpful in job matching. Despite this, on those platforms where skill tests are available more than half of crowdworkers indicated that they had taken at least one of these tests. Improving the quality and reliability of skills assessment tests may, therefore, provide a useful medium for crowdworkers to showcase their potential to possible future clients.

The interview findings further suggest that externally provided and externally regulated skills tests, such as Google Ads certification, are often viewed by crowdworkers as more valuable in terms of the skills they cover. However, their inability to display such certificates on their platform profiles in a way that is validated by the platform inhibits their usefulness in skills matching.

# 6.5. Recommendations for future research

In this section we outline a few directions for future research arising from this study.

# 6.5.1. Crowdwork potential and labour market integration for vulnerable groups

There are indications that crowdwork could already be acting as a medium of labour market integration for some vulnerable segments of the population; 32% of the survey respondents have an immigrant background. Further research should uncover whether this represents intra-European immigration, skilled non-EU migrants or skilled refugees using online platforms as a means of overcoming local labour market constraints (for instance, native language deficiency or employer hiring bias). Females are also observed to report more frequent skill development in crowdwork than men. However, successful crowdworkers on online labour platforms, especially the freelance market, are typically highly educated and possess significant work experience in the traditional labour market before entering crowdwork.

This suggests that the potential of using crowdwork as a policy tool to address youth unemployment is dependent on high-quality investment in a combination of digital, entrepreneurial and core skills training for young individuals. Obtaining a realistic understanding of crowdwork's potential for labour market integration for different population subgroups requires more analysis and research on potential unintended side effects of platform work, such as labour market segmentation ('stepping stone effect' versus being locked in in platform work) and crowding out of traditional employment with better working conditions (Eurofound, 2018). Successful labour market integration is also intrinsically dependent on the long-term sustainability of the skill matches made in the first instance (Cedefop, 2018).

# 6.5.2. Crowdworker self-organisation and networking for learning and skill development

To develop a comprehensive understanding of workplace learning and skill development practices in crowdwork, we need to research what people learn through online platform work, how they learn it, why they learn it, and who they learn with. Analyses in this project have focused primarily on the first two components.

It is important, however, also to understand with whom workers learn, including crowdworkers' self-organisation practices, personal and professional networks and collaborations, self-organised communities and the role of these networks and collaborations in the learning process. Key research questions include:

- (a) what are workers' self-organisation processes and practices supporting their learning and development in crowdwork?
- (b) what social and professional networks and communities – offline and online – do workers draw on to learn and develop skills, how are these networks shaped and constituted, and how are they developed and maintained?
- (c) what technologies do workers use and how do they use them to support their learning and development through these networks and communities?
- (d) how can crowdworkers' self-organised learning activities be supported and enhanced, for example through work design, platform interface design or policies?

# 6.5.3. Implications of work and learning practices in crowdwork for learning and teaching in educational settings

It is important to identify how pedagogic approaches and teaching methods could be advanced and reconceptualised to enable students develop the knowledge, skills and dispositions to function effectively and productively in the platform economy. Key research questions include:

- (a) what teaching approaches and learning models can support students in developing the skills, knowledge and dispositions required in platform workplaces?
- (b) what are the key principles underpinning the teaching approaches and learning models aligned with the requirements of new forms of digital and Al-based work in the platform economy?
- (c) what are the higher education policy implications of the emergent work and learning practices, and what are the differential roles of the key actors and stakeholders – students, academics, administrators, employers, platforms, national and supranational governments – in enhancing the alignment between higher education and workplaces within both the conventional economy and the platform economy?

# 6.5.4. Crowdwork platform clients

There is very little research around the composition and demographics of the platforms' client base, their motivations in outsourcing work through platforms, how they identify whom to hire and how to post their vacancies and the ways in which outputs of platform work are used by clients. Additional research is needed to develop better understanding of the clients as one of the main actors within the production system of platform work.

# 6.5.5. Understanding the cross-fertilisation of learning and skills across main and other jobs

With an increasing share of workers engaging in multiple job-holding (Pouliakas, 2017), the trend towards increasing freelancing and platform work may have significant implications for the skill accumulation of workers in their secondary jobs or tasks. Panos et al. (2014), who studied the interrelated dynamics of multiple jobholding, human capital and occupational mobility, have shown that multiple jobholding can act as a conduit for obtaining new skills and experience and as a stepping-stone towards new careers, also involving self-employment. Considering such important human capital spill-over effects between primary and other employment, more research is needed to investigate the cross-fertilisation of learning across the traditional and platform economies, most notably if the skills individuals acquire in platform work can affect their overall employability and job quality in the traditional labour market.

# Abbreviations/Acronyms

API	application programming interface
Cedefop	European Centre for the Development of Vocational Training
CERT	community, engagement, repeat usage, trust
CISSP	Certified information systems security professional
EU	European Union
Eurofound	European Foundation for the Improvement of Living and Working Conditions
GDPR	General data protection regulation
IL0	International Labour Organization
IPSE	Association of Independent Professionals and the Self-Employed
JRC	Joint Research Centre
MOOCs	massive open online courses
RQs	research questions
SRL	self-regulated learning
SRLWQ	self-regulated learning at work questionnaire
SME	small- and medium-sized enterprise
VET	vocational education and training
WLA	workplace learning activity

# References

[URLs accessed 3.4.2020]

Bandura, A. (1997). Self-efficacy: the exercise of control. New York: Freeman.

- Bethlehem, J. (2010). Selection bias in web surveys. *International statistical review*, Vol. 78, No 2, pp. 161-188.
- Billett, S. (2014). *Mimetic learning at work: learning in the circumstances of practice.* Heidelberg: Springer.
- Billett, S.; Harteis, C.; Etelapelto, A. (2008) (eds). *Emerging perspectives of workplace learning.* Rotterdam: Sense Publishers.
- Boisot, M. et al. (2011). Collisons and collaboration: the organization of learning in the ATLAS experiment at the LHC. Oxford: Oxford University Press.
- Cedefop (2018). From long-term unemployment to a matching job. Luxembourg: Publications Office of the European Union. Cedefop reference series; No 107. https://www.cedefop.europa.eu/en/publications-and-resources/publications/3076
- Cedefop (2019). Literature review: skills formation and skills matching in online platform work: policies and practices for promoting crowdworkers' continuous learning (CrowdLearn) [unedited report]. Thessaloniki: Cedefop. https://www.cedefop.europa.eu/files/crowdlearn\_literature\_review.pdf
- Corporaal, G.; Lehdonvirta, V. (2017). *Platform sourcing: how fortune 500 firms are adopting online freelancing platforms.* Oxford: Oxford Internet Institute. https://www.oii.ox.ac.uk/publications/plat-form-sourcing.pdf
- De Hert, P. et al. (2018). The right to data portability in the GDPR: towards user-centric interoperability of digital services. *Computer law & security review*, Vol. 34, No 2, pp. 193-203.
- Dixon-Woods, M. et al. (2005). Synthesising qualitative and quantitative evidence: a review of possible methods. *Journal of health services research and policy,* Vol. 10, No 1, pp. 45-53.
- Eraut, M. (2007). Learning from other people in the workplace. *Oxford review of education,* Vol. 33, No 4, pp. 403-422.
- Ericsson, K.A. et al. (2006). *The Cambridge handbook of expertise and expert development.* Cambridge: Cambridge University Press.
- Eurofound (2015). New forms of employment. Luxembourg: Publications Office of the European Union.
- Eurofound (2018). *Employment and working conditions of selected types of platform work*. Luxembourg: Publications Office of the European Union.
- Felstead, A. et al. (2009). Improving working as learning. London: Routledge.
- Fontana, R.P. et al. (2015). Measuring self-regulated learning in the workplace. *International journal of training and development,* Vol. 19, No 1, pp. 32-52.
- Fuller, A.; Unwin, L. (2004). Expansive learning environments. In: Fuller, A.; Munro, A.; Rainbird, H. (eds). Workplace learning in context, pp. 126-144. London: Routledge.
- Gomez-Herrera, E; Mueller-Langer, F. (2019). *Is there a gender wage gap in online labor markets? Evidence from over 250 000 projects and 2.5 million wage bill proposals.* JRC digital economy working paper 2019-01 - JRC technical reports.

https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/ there-gender-wage-gap-online-labour-markets-evidence-over-250000-projects-and-25-million

Gonzalez Vazquez, I. et al. (2019). *The changing nature of work and skills in the digital age*. Luxembourg: Publications Office of the European Union. https://ec.europa.eu/jrc/en/publication/ eur-scientific-and-technical-research-reports/changing-nature-work-and-skills-digital-age

- Guile, D. (2011). Apprenticeship as a model of vocational 'formation' and 'reformation': the use of foundation degrees in the aircraft engineering Industry. *Journal of vocational education and training,* Vol. 63, No 3, pp. 451-464.
- Gupta, N. (2017). An ethnographic study of crowdwork via Amazon Mechanical Turk in India. PhD thesis, University of Nottingham.
- Horton, J.J.; Tambe, P. (2019). *The death of a technical skill.* Working paper. http://john-joseph-horton.com/papers/schumpeter.pdf
- Huws, U.; Spencer, N.H.; Joyce, S. (2016). Work in the European gig economy: research results from the UK, Sweden, Germany, Austria, The Netherlands, Switzerland and Italy. Brussels: Foundation for European Progressive Studies.
- Illeris, K. (2011). The fundamentals of workplace learning. London: Routledge.
- Kässi, O.; Lehdonvirta, V. (2018). Online labour index: measuring the online gig economy for policy and research. *Technological forecasting and social change*, Vol. 137, pp. 241-248.
- Kässi, O.; Lehdonvirta, V. (2019). Do digital skill certificates help new workers enter the market? Evidence from an online labour platform. https://doi.org/10.31235/osf.io/7tybd
- Lehdonvirta, V. (2018). Flexibility in the gig economy: Managing time on three online piecework platforms. *New technology, work and employment,* Vol. 33, No 1, pp. 13-29.
- Lehdonvirta, V. et al. (2019). The global platform economy: a new offshoring institution enabling emerging-economy microproviders. *Journal of management,* Vol. 45, No 2, pp. 567-599.
- Littlejohn, A. et al. (2016a). Professional learning through everyday work: how finance professionals self-regulate their learning. *Vocations and learning*, Vol. 9, No 2, pp. 207-226.
- Littlejohn, A. et al. (2016b). Learning in MOOCs: motivations and self-regulated learning. *The internet and higher education,* Vol. 29, pp. 40-48.
- Malloch, M. at al. (2011). (eds). The SAGE handbook of workplace learning. London: SAGE.
- Margaryan, A. (2016). Understanding crowdworkers' learning practices. Proceedings of the Internet, policy and politics conference 2018, Oxford, UK. https://blogs.oii.ox.ac.uk/policy/ipp-conference/
- Margaryan, A. (2019a). Workplace learning in crowdwork. *Journal of workplace learning,* Vol. 31, No 4, p. 250-273. doi: 10.1108/JWL-10-2018-0126
- Margaryan, A. (2019b). Comparing crowdworkers' and conventional knowledge workers' self-regulated learning strategies in the workplace. *Human computation,* Vol. 6, No 1, pp. 83-97.
- Margaryan, A.; Littlejohn, A.; Milligan, C. (2013). Self-regulated learning in the workplace: strategies and factors in the attainment of learning goals. *International journal of training and development*, Vol. 17, No 4, pp. 245-259.
- Margaryan, A.; Milligan, C.; Littlejohn, A. (2011). Validation of Davenport's classification structure of knowledge-intensive processes. *Journal of knowledge management,* Vol 15, No 4, pp. 568-581.
- Milligan, C.; Littlejohn, A. (2014). Supporting professional learning in a massive open online course. *International review of research in open and distance learning*, Vol. 15, No 5, pp. 197-213.
- Milligan, C. et al. (2015). Self-regulated learning behaviour in the finance industry. *Journal of Workplace Learning*, Vol. 27, No 5, pp. 387-402.
- Milligan, C.; Littlejohn, A. (2016). How health professionals regulate their learning in massive open online courses. *The Internet and higher education,* Vol. 31, pp. 113-121.
- Morgeson, F.P.; Humphrey, S.E. (2006). The work design questionnaire (WDQ): developing and validating a comprehensive measure for assessing job design and the nature of work. *Journal of applied psychology,* Vol. 91, No 6, pp. 1321-1339.
- Morse, J. (2012). The implications of interview type and structure in mixed-method designs. In: Gubrium, J.F. et al. (eds). *The Sage handbook of interview research: the complexity of the craft* pp. 193-205. Thousand Oaks, California: Sage.
- Pallais, A. (2014). Inefficient hiring in entry-level labor markets. *American economic review*, Vol. 104, No 11, pp. 3565-3599. https://doi.org/10.1257/aer.104.11.3565
- Panos, G.; Pouliakas, K.; Zangelidis, A. (2014). Multiple job-holding, skills diversification and mobility. *Industrial relations*, Vol. 53, No 2, pp. 223-272.
- Penard, T. (2019). Do sharing economy platforms foster trust in others? Evidence from a survey experiment. Paper presented at SASE 2019, New York, 26-29 June 2019.
- Pesole, A. et al. (2018). *Platform workers in Europe evidence from the COLLEEM survey.* Luxembourg: Publications Office of the European Commission.
- Pouliakas, K. (2017). Multiple job-holding: career pathway or dire straits? IZA world of labor, No 356.
- Schon, D.; DeSanctis, V. (2011). The reflective practitioner: how professionals think in action. *The journal of continuing higher education*, Vol. 34, No 3, pp. 29-30.
- Shapiro, C.; Varian, H.R. (1999). The art of standards wars. *California management review*, Vol. 41, No 2, pp. 8-32.
- Skule, S. (2004). Learning conditions at work: a framework to understand and assess informal learning in the workplace. *International journal of training and development*, Vol. 8, No 1, pp. 8-20.
- Teubner, T.; Adam, M.T.P.; Hawlitschek, F. (forthcoming). Unlocking online reputation: on the effectiveness of cross-platform signalling in the sharing economy. *Business and information systems engineering.*
- Urzì Brancati, C.; Pesole, A.; Fernández-Macías, E. (2019). Digital labour platforms in Europe: numbers, profiles, and employment status of platform workers. Luxembourg: Publications Office of the European Union. doi:10.2760/16653, JRC117330
- Wood, A.J.; Lehdonvirta, V. (2019). Platform labour and structured antagonism: understanding the origins of protest in the gig economy. *Oxford Internet institute platform economy seminar series.*
- Zimmerman, B.J. (2006). Development and adaptation of expertise: the role of self-regulatory processes and beliefs. In: Ericsson, K.A. et al. (eds.). *The Cambridge handbook of expertise and expert performance*, pp. 705-722. New York, NY, US: Cambridge University Press.
- Zimmerman, B.J.; Kitsantas, A. (2005). The hidden dimension of personal competence: self-regulated learning and practice. *Handbook of competence and motivation.*



Digital skills gap in Europe

https://ec.europa.eu/digital-single-market/en/news/digital-skills-gap-europe Eurofound's Web repository on the platform economy

https://www.eurofound.europa.eu/data/platform-economy/records

Eurostat - Tertiary education statistics

https://ec.europa.eu/eurostat/statisticsexplained/index.php/Tertiary\_education\_st atistics iLabour project

https://ilabour.oii.ox.ac.uk/where-are-online-workers-located-the-international-division-of-digi-tal-gig-work/

JA company programme http://coyc.jaeurope.org/about/ja-company-programme.html JA start-up programme http://eec.jaeurope.org/jaeec18/ja-start-up.html Learn from Fiverr https://learn.fiverr.com

OII qualtrics https://oii.qualtrics.com/jfe/form/SV\_6i1dJ2H1hVf9bP7

Online labour index https://ilabour.oii.ox.ac.uk/online-labour-index/ People per hour

https://blog.peopleperhour.com/blogroll/partnership-skillshare-get-3-month-free-membership/ Skill share https://www.skillshare.com/lists/PeoplePerHour/69

Upwork events https://community.upwork.com/t5/Upwork-Events/bd-p/Upwork\_Events Training Leads https://events.fiverr.com/#community

### ANNEX 1. Methodology

#### A1.1. Crowdworker interview methodology

The data on crowdworkers' continuing skill development, insight into learning practices and skill utilisation strategies was collected using an online, synchronous, semi-structured interview. The semi-structured method is ideal in situations where an emergent knowledge base is being established and where boundaries of the phenomena remain poorly delineated, as was the case here. As noted by Morse (2012, p. 197), 'Semi-structured interviews are [best] used when the researcher knows enough about the topic or phenomenon to identify the domain (i.e. knows the limits of the topic and what is and is not pertinent to the research question) but does not know and cannot anticipate all of the answers'.

The semi-structured interview method allowed us to explore with the crowdworkers a set of predefined interview questions around the factors impacting their skills development and learning in crowdwork settings, including gaps and opportunities in these areas. At the same time, this method was sufficiently open-ended and supple to identify, investigate and pursue unanticipated questions that emerged during the interview.

Given that crowdwork and its related communication take place online, online interviewing provided the most natural setting for generating data on learning practices with and of crowdworkers. It also allowed for a sampling strategy that targeted crowdworkers from a variety of EU state contexts, so that we could examine a range of perspectives on the role of learning across crowdworkers' life course.

#### Sampling and recruitment

We interviewed 77 crowdworkers who were working on one of four online freelancing platforms (Upwork, PeoplePerHour [PPH], Fiverr, and Twago) at the time of their recruitment. Over 700 crowdworkers were contacted, with the majority contacted by one of three ways: by sending a private message to their LinkedIn profile; by posting a 'job' on one of the target platforms advertising the interview segment of the project and hiring eligible crowdworkers who applied; and by inviting eligible crowdworkers to apply to our posted 'jobs' through the platform's invitation-to-apply function. Additionally, Twago assisted our recruitment efforts by sending a recruitment message by email to 200 members of their German website, and Fiverr sent a recruitment message to EU-based users of Learn from Fiverr.

Crowdworkers were considered eligible if they met the following criteria: were 18 years old or older, currently resided in one of the six target countries (Germany, Spain, Italy, Romania, Finland and the United Kingdom), were currently doing work through one of the four target platforms, and were willing to participate in a synchronous online interview, either through video or by audio only.

All eligible applicants were asked to complete an online pre-interview survey which collected demographic data (gender, age, level of education, current employment status), contact details, information useful to scheduling individual interviews (dates and times available), and further information on their freelancing (uploading CVs, links to freelancing profiles). 125 individuals completed the pre-interview survey; however, this included responses from 48 individuals who either did not meet the eligibility criteria (for example, their LinkedIn profile said they lived in a target country but they did not) or who ultimately chose not to participate in an interview.

As demonstrated in Table 1 and Table 2, we achieved a relatively even gender split in our sample, with more than three-quarters under the age of 35. The most represented platforms are Upwork (n=22) and PeoplePerHour (n=23), with Fiverr (n=18) and Twago (n=14) yielding few-

er respondents (Source: Cedefop CrowdLearn crowdworker interviews, Table 3). However, the majority of the freelancers (n=53) we studied used more than one platform to offer their services. A considerable proportion of respondents are based in the UK (n=31) (Source: Cedefop CrowdLearn crowdworker interviews, Table 4), in line with comparable data suggesting that the UK is the biggest European country in terms of number of workers in the online freelancing market (13). According to the Online labour index, UK-based workers were the sixth largest supplier of online labour, contributing roughly 6% of the global workforce in July 2017. Combined, all European Union member state-based workers (minus those in the UK) equalled <1% of the global online workforce in that particular data set (consisting of workers from four online freelancing platforms: Fiverr, Freelancer, Guru, and PeoplePerHour).

### Table 1. Crowdworker sample demographics: gender (n=74)

Gender	(n)
Female	36
Male	38

Source: Cedefop CrowdLearn crowdworker interviews.

### Table 2. Crowdworker sample demographics: age (n=74)

Age group	(n)
18-24	15
25-34	42
35-44	9
45-54	4
55-64	3
65-74	1

Source: Cedefop CrowdLearn crowdworker interviews.

#### Table 3. Crowdworker sample primary platform (n=77)

Primary platform	(n)
Fiverr	18
PeoplePerHour	23
Twago	14
Upwork	22

Source: Cedefop CrowdLearn crowdworker interviews.

### Table 4. Crowdworker sample demographics: country of residence (n=77)

Country residence	(n)
Finland	4
Germany	22
Italy	7
Romania	8
Spain	5
UK	31

Source: Cedefop CrowdLearn crowdworker interviews.

Data (Table 5) indicate that our sample of workers are well educated, with over half holding a minimum of a bachelor degree, and 28% holding a postgraduate degree. Most considered their employment status to be self-employment (n=43) and it was not uncommon to consider online freelancing as full-time employment (n=12) (Source: Cedefop CrowdLearn crowdworker interviews, Table 6). In classifying the specific sector that freelancers were involved in, we obtained a fairly consistent spread across Online labour index worker categories (14). The most popular categories that freelancers worked in were creative and multimedia, writing and translation, and software development and technology (Source: Cedefop CrowdLearn crowdworker interviews, Table 7).

(<sup>13</sup>) The comparative data was retrieved from the Online labour index on 21.2.2019:

https://ilabour.oii.ox.ac.uk/where-are-online-workers-located-the-international-division-of-digital-gig-work/

<sup>(14)</sup> https://ilabour.oii.ox.ac.uk/online-labour-index/

### Table 5. Crowdworker sample education (n=74)

Highest level of education	(n)
High school or less (no degree)	3
High school graduate	10
Trade training	1
Professional/Vocational degree	3
Bachelor degree	36
Master/Doctoral degree	21

*Source:* Cedefop CrowdLearn crowdworker interviews.

### Table 6. Crowdworker sample employment status (n=69)

Type of work	(n)
Full-time employment	12
Part-time employment	5
Self-employment	43
Student	4
Homemaker/Carer	1
Out of work	4

*Source:* Cedefop CrowdLearn crowdworker interviews.

### Table 7. Crowdworker sample primary category of crowdwork (n=77)

Online Labour Index category	(n)
Clerical and Data Entry	8
Creative and Multimedia	16
Professional Services	11
Sales and Marketing Support	12
Software Development and Technology	14
Writing and Translation	16

Source: Cedefop CrowdLearn crowdworker interviews.

Overall, we can see that there are some national level variations in the makeup of the freelancers interviewed, but the majority were college educated (<sup>15</sup>), 25-34 years old and worked across a range of occupation categories.

#### Interview structure

Interviews lasted 45 to 60 minutes each and were conducted using Skype, Google Hangouts, WhatsApp, or Facetime, with participants choosing the platform and whether to interview through a video link or by audio only. A series of largely open-ended questions were asked around four themes:

- (a) what do crowdworkers learn as part of crowdwork?
- (b) why do crowdworkers learn as part of their crowdwork?
- (c) how do crowdworkers learn?
- (d) with whom do crowdworkers learn?

Digital artefacts (such as online profiles) collected through the pre-interview survey were used to inform the interviewers' line of questioning by personalising the interview script for each crowdworker. Interviewers also followed up on themes that emerged during the interviews by improvising new questions and prompts to explore unanticipated findings.

#### **Data and analysis**

Audio recordings from the interviews were transcribed and transcripts imported into NVivo for analysis. The transcripts were coded using an initial coding scheme (Table 8). The first two codes were further divided into sub-codes in order to identify differences in what skills were learned and how pre-freelancing compared to during freelancing. During the analysis stage, the data coded by the 'What people learn' sub-codes were organised into a typology of skills that can be found in the Annex 2. The third code (With whom they learn) was given two sub-codes in order to delineate fellow group members – with whom no learning took place – from explicit co-learners. The final three codes (Why they

(<sup>15</sup>) While only three crowdworkers we interviewed self-identified as holding a professional or vocational degree, some of the undergraduate and postgraduate degrees held by other interviewees were also trade-specific (e.g. master degree in geographic information systems, bachelor degree in web development). learn, Skills matching, and What would they change?) were left without sub-codes, in order that new typologies might be developed organically, starting with high-level coded excerpts.

Table 8.	Initial coding scheme for
	crowdworker interviews

Code	Sub-code	
How skills are learned	Ways of learning during freelancing	
	Ways of learning pre-freelancing	
What people learn	Skills learned during freelancing	
	Skills learned pre-freelancing	
	Who they learn with	
With whom they learn	Who they share membership with	
Why they learn		
Skills matching	N/A	
What would they change?		

*Source:* CrowdLearn research team.

#### Developing a typology of skills

To address RQ1, we used the interview data to develop a typology of skills used in crowdwork; the typology was developed inductively from the data. Initially, the interview transcripts were coded by two researchers, using two broad sets of predefined codes: skills developed during crowdwork and skills developed prior to crowdwork that were used in crowdwork. Within each of these two broad sets of codes, all skills mentioned by the workers were captured at the lowest level of abstraction. For example, when a respondent discussed software development skills, each specific software skill was coded separately, such as 'software - architecture', 'software - graphics editor', 'software - spreadsheets'. For each skill, the number of times the skill was mentioned and the number of respondents who mentioned it were recorded. These specific skills for each of the phases (pre-crowdwork and during crowdwork) were

then grouped into higher level skill categories – such as 'technical/core skills', 'communication skills', and 'learning to learn skills' – by a third researcher. Instances where there was a disagreement or lack of clarity about the low-level codes were discussed by the three researchers and refined or recoded as a result.

#### Developing a typology of learning practices

To address RQ2, we developed a typology of learning practices in crowdwork (Annex 3). We scoped crowdworkers' learning practices by using the Workplace learning in crowdwork questionnaire (WLCQ) as our base instrument. The original version of the questionnaire – prior to the modifications that have taken place as part of the CrowdLearn project – was developed as part of the Learning in crowdwork project (2016-18, funded by Alexander von Humboldt Foundation), led by CrowdLearn project member Anoush Margaryan.

The WLCQ instrument is adapted from three published and validated questionnaires that were originally developed to measure learning practices within conventional knowledge work occupations: the Self-regulated learning at work questionnaire (SRLWQ) (Fontana et al., 2015), the Classification structure for knowledge-intensive processes (Margaryan et al., 2011), and the Work design questionnaire (Morgeson and Humphrey, 2006). WLCQ has been recently trialled across two crowdwork platforms (Upwork and CrowdFlower) as part of the Learning in crowdwork project (Margaryan, 2016; Margaryan, 2019a and 2019b), where it has been further refined.

We developed a draft typology based on the WLCQ instrument to be used as a lens with which to understand the crowdworker interviews. The typology is largely conceptual, in that it is based on theoretical models and typologies derived from the workplace learning and educational psychology literatures (including Fontana et al., 2015; Littlejohn et al. 2016b; Littlejohn et al. 2016a; Milligan and Littlejohn, 2014; Milligan and Littlejohn, 2016). Data from the crowdworker interviews were examined using this typology in order to identify any novel (previously unidentified) learning practices.

### Examining the perception and use of skills development resources and skills matching

To address RQ4a, we conducted a second round of analysis of interview data which had previously been coded as Ways of learning during freelancing, Why they learn, and What would they change. These coded excerpts were further coded for crowdworkers' perception of these resources, and crowdworkers' actual use of these resources. A list of use cases was developed, identifying when and why crowdworkers did or did not use particular skills development resources.

To address RQ4b, crowdworker interview excerpts which had been coded as Skills matching or What would they change were thematically reanalysed for examples of how platforms match crowdworker skills to the (purported) needs of clients, crowdworker perceptions of the effectiveness of these various skills matching methods, and how crowdworkers manipulate these mechanisms in order to increase their success rate in being hired for well-paying, relevant work with reasonable clients.

# A1.2. Stakeholder interview methodology

In addition to interviewing crowdworkers themselves, we also interviewed representatives of other stakeholder groups. The purpose of these interviews was to provide a wider view of the field, particularly to yield insights into the role of different organisations and policies in skill development and skills matching in crowdwork, addressing RQs 4-6.

#### Sampling and recruitment

Recruitment efforts were aimed at gaining research participants from a wide range of organisations and viewpoints, including from crowdwork platform companies, clients of crowdwork platforms, trade unions, professional bodies for the self-employed, policy experts and researchers, and stakeholders involved in initiatives concerning validation of informal learning and skills. To identify suitable stakeholder organisations within these categories, and individuals representing these organisations, we used our existing networks and advice from Cedefop. We also looked for exemplar individuals and organisations within the scholarly and policy literature, and at related conferences. Snowball sampling was also used to access more potential participants.

A particular challenge was identifying stakeholders who held specific views or expertise at the intersection of platforms, crowdwork, and skills. Many stakeholder representatives were interested in this topic area and were keen to follow the policy discussion, but simultaneously lacked the confidence to strongly express their own views on it. This diminished our potential pool of interviewees and is also notable as it suggests that there is demand for more information and analysis in this area, and a lack of supply.

We ultimately identified a long list of 49 potential stakeholder representatives, of which we successfully interviewed 25 representatives of 23 different organisations. A further 24 potential participants were contacted but could not be reached or declined to take part in the study. The types of stakeholders represented by the successful sample are outlined in Table 9.

### Table 9. Types of stakeholder organisations represented in the sample

Type of stakeholder	Organisations represented
Crowdwork platform companies	5
Large clients of crowdwork platforms	1
Policy experts and researchers	6
Unions	5
Freelancer professional associations	1
Government agencies	5

Source: Cedefop CrowdLearn stakeholder interviews.

Since nationality is one axis of difference in our research questions, we aimed for a trans-European interview cohort. Our sample included participants with special expertise in the following national contexts: Belgium, Germany, Ireland, Spain, France, Italy, Netherlands, Finland, Sweden, and the UK, as well as the US. However, the primary selection criterion was each stakeholder's level of knowledge and expertise relative to labour platforms. This usually meant that participants had a pan-European perspective with specific knowledge of their country of origin and work location. As a result, it was difficult to cover European countries that are relatively underrepresented in policy circles, such as CrowdLearn target country Romania.

### Semi-structured telephone and video conferencing interviews

The interviews were semi-structured and conducted via telephone or video conferencing. We did not always know in advance what the participant knew about the relationship between skills and crowdwork, so we allowed for a flexible approach within which we could explore unexpected lines of enquiry. Our target time for each interview was an hour; however, in some cases where the participant had an in-depth knowledge of the field the interview continued for up to 90 minutes.

#### **Data and analysis**

Audio recordings from the interviews were transcribed. To produce insights for this report, a member of the research team read through the transcripts and noted information that addresses the research questions or offered other potentially relevant insights. The findings were then cross-checked with findings from the crowdworker interviews and, where necessary, supplemented with additional desk research. To understand better the various mechanisms through which platforms facilitate skills development and skills matching, we manually inspected the features offered by the platforms. The overall findings were then summarised into the narratives presented in this report.

## A1.3. Crowdworker survey methodology

In the second phase of the research project, we collected data on the learning practices and skill

development of 1001 crowdworkers through the means of an online survey. Our instrument was distributed online, using Qualtrics, a leading professional online survey tool. The long version of the instrument took roughly 25 minutes to complete. Participants were compensated either USD 9.50, EUR 8.50 or GBP 7-7.50 for their efforts depending on their online store preference, exchange rates and platform fees.

#### Survey instrument

We scoped crowdworkers' learning practices by using the Workplace learning in crowdwork questionnaire, WLCQ, as our base instrument. The original version of the questionnaire, prior to the modifications that were undertaken as part of the CrowdLearn project, was developed during the Learning in crowdwork project (2016-18, funded by Alexander von Humboldt Foundation) led by our Senior Expert, Anoush Margaryan. An illustrative, not platform-specific example of our survey instrument can be tested online (https:// oii.qualtrics.com/jfe/form/SV\_6i1dJ2H1hVf-9bP7). It was originally adapted from three published and validated questionnaires that were developed to measure learning practices within conventional knowledge work occupations: the Self-regulated learning at work questionnaire, SRLWQ (Fontana et al., 2015), the Classification structure for knowledge-intensive processes (Margaryan et al., 2011) and the Work design questionnaire (Morgeson and Humphrey, 2006).

Our adapted survey instrument begins with an introductory section including two questions to check eligibility, background information on the CrowdLearn research project (including a short video introducing the research team) and a consent page. In the first section, participants are asked about the nature of their crowdwork tasks using scales from Margaryan et al. (2011) and Morgeson and Humphrey (2006), the project categories in which they accept most projects and the skills developed prior and during crowdwork which are necessary to complete their work. In the second and third sections, participants are required to elaborate on their workplace learning activities and strategies respectively, measured on a four-point Likert scale. Learning activities are based on a typology originally introduced by Fontana et al. (2015) that captures individual and collective, as well as formal and informal dimensions of learning. Learning strategies are understood in the form of the behavioural and metacognitive self-regulated learning (SRL) strategies which workers undertake to complete their tasks. Our items were derived from Zimmerman and Kitsantas's (2005) three-phase model of self-regulated learning that divides strategies into phases of planning, implementation and reflection. A popular model in educational psychology literature, it has been introduced to the analysis of self-regulated learning in the workplace literature in recent years (Margaryan et al., 2013; Milligan et al., 2015; Littlejohn et al., 2016a). In the fourth section of the survey, we included additional questions on communication between workers, platforms and the national government, specifically concerning efforts of organised labour. In the final section of the questionnaire, we record crowdworkers' demographic information and motivations for learning.

The most notable adaptation we made to the WLCQ base survey instrument was the inclusion of our newly induced skills typology. In our instrument, respondents are asked to select and rank all those skill categories that are useful for crowdwork, differentiating between skills learned before and after joining the platform. We additionally collect crowdwork-specific data such as the job categories in which the respondents accept most of their projects and respondents' usage of skill tests offered by platform providers. The second and third sections were adjusted to include additional answer statements, for instance on skill certification and learning in online community forums. The fourth section is an entirely new addition. In the last section, we added to the amount of personal information collected from survey participants to include potential sources of stratification and inequality such as nationality at birth, the number of dependents, social class and cultural and social capital; we also included participants' dependence on crowdwork and their affinity to platform work more generally. All adjustments reflected input from peers or were activities mentioned by interviewees during the qualitative phase of the project.

The distributed survey instrument was largely identical across platforms. The only differences were based on platform-specific names, jargon and context. We decided to shorten the fourth section on crowdworker interactions with fellow freelancers and other stakeholders for those surveys that were distributed with the assistance of platform providers. Since some questions in this section went beyond the immediate scope of skill development and learning, it was easier to communicate and secure assistance this way. To prevent biased responses, these questions were placed at the end of the fourth section, followed only by socio-demographic questions. For surveys that were distributed anonymously rather than through a personalised link, we added opportunities for respondents to pick their preferred means of compensation and to provide contact details to receive a copy of the final report or a gift card.

#### Sampling and recruitment

We received 1 001 valid responses after reaching out to a minimum of ~3 500 and a maximum of ~7 500 crowdworkers. Across platforms and sampling methods, our average response rate lies somewhere between 14 and 28%. The collected sample offers perspectives from workers that vary along important dimensions such as field of work, age, education and work experience. Adding to the overview provided in Figure 1, we further summarise some sample statistics in Figure 32.

Most of our sample includes workers from three major online labour platforms, Upwork, Fiverr, and PeoplePerHour. Some additional responses were collected from Twago. To be considered an eligible respondent, a person had to work from one of six EU target countries (Germany, Spain, Italy, Romania, Finland or the UK), be at least 18 years old and have work experience on the platform in question. The selection of countries was based on archetypes to represent adequately the different geographical regions of the EU and different economic and welfare regimes across the region. The different economic regimes pose differential barriers and enablers to workplace learning and skill development, as shown in the adult learning litera-

#### Figure 32. Sample characteristics of the CrowdLearn survey

#### Share of respondents, in %

Entire sample Sample size: N=1 001



Source: Cedefop CrowdLearn data set.

ture. The platforms were selected based on our choices in the interview phase in the first part of the research project.

We relied on three sampling methods: platform-assisted probability sampling, equal quota sampling, and snowball sampling.

Roughly half of our sample was collected using snowballing and equal quota sampling. For this subsection of our sample, we randomly identified crowdworkers while ensuring equal quotas for country of work and gender. As expected, the sub-sample achieved through equal quota sampling and snowballing is balanced for both variables. Each of the six countries as work locations makes up between 16 to 18% of the sub-sample. Slightly more than half (51%) of the sample are female. Ultimately, the equal quotas used are helpful because they allow us to compare sub-populations that are of interest for policy, as country of work is for national policy-makers. We decided against our original intention of keeping quotas equal for project categories. For equal quota sampling, response rates ranged between <5% and >50% depending on the platform. The difference in response rates could be due to varying degrees of platform activity, different asking prices for survey participation, or the technological design of the platforms. On Upwork, for instance, we were able to approach crowdworkers directly and individually by committing the compensation for their time and effort in an escrow fund for a set number of days in combination with an introductory message. While this approach was time-consuming, it also allowed a detailed description of our project and a direct exchange with the freelancer, for instance to alleviate concerns about data privacy. In sum, we reached out to ~2 650 freelancers to record 523 valid responses, so our average response rate for equal-quota sampling was 20%. In addition, we asked crowdworkers who supported us in the qualitative research phase to participate and share the survey amongst their colleagues. We contacted 38 workers which yielded another 13 responses. The average response rate for this approach was 34% at best, i.e. if no additional crowdworkers were invited. Snowballing via LinkedIn and online community forums did not prove to be a successful means of securing additional respondents in our case.

The other half of our sample was collected with assistance from two platforms, Fiverr and PeoplePerHour. The platforms supported us by distributing a project description and an anonymous survey link within a sample of crowdworkers. One platform assisted by drawing a random sample of workers. The other randomly selected workers while keeping country quotas constant. The latter approach only worked up to a point, especially for the limited number of Finnish workers active on the platform. The decision to switch from random sampling to random selection with equal country quotas was again made to ensure sufficient sample variation to allow for comparisons of different types of freelancers.

### Conceptual, methodological and ethical challenges

In addition to standard considerations for research involving human respondents in line with our institutions' research ethics standards, we explicitly focused on the collection of informed consent, securing data protection and the prevention of worker exploitation.

All respondents granted their written consent before participating in the survey. An informed consent page explained all details of our project that were not explained in our introductory video or the project description page beforehand. As needed, we provided a contact person for additional queries. Some participants made use of that offer and we responded to their queries in a timely manner.

Throughout the entire data collection period, we ensured that regulations specified by the EU data protection regulations, Cedefop and the lead institution, the University of Oxford, were adhered to. We treated the data as personal and stored it in Oxford Internet Institute's compliant internal cloud storage system. Access was provided only to the project team and the data was anonymised before its further analysis or distribution to the funding organisation.

While we received some criticism for the low financial incentives of our survey, our payments were above the minimum wage in the UK and most freelancers were motivated to participate beyond financial payments. That said, almost all workers accepted some form of payment, either in form of in-platform payments or Amazon gift cards.

One ethical concern that we underestimated before the survey roll-out was reputational risks. Various freelancers with high average wages and specialist portfolios declined our project offer or did not want it to appear on their profile. They were fearful of risking their reputation as a specialist or high-paid (and thus skilled) freelancer. For future research, it is worth considering such reputational damage to workers not only among clients, but also the search algorithms on the platforms.

Conceptually and methodologically, there were five key issues to be considered in this part of the project: the unknown crowdwork population, potential self-selection bias while sampling, workplace learning as an elusive research topic, data quality at risk, and the integration of qualitative and quantitative findings.

We addressed the unknown nature of the crowdworking population as rigorously as possible by drawing random samples whenever we ensured platform assisted sampling. For all remaining platforms, we resorted to some form of equal quota sampling to ensure a sample with as much variation in key dimensions as possible.

Despite our best efforts while sampling, self-selection bias remained an issue throughout the survey distribution. Self-selection is the biasing of the sample by collecting more contributions from freelancers that have a preference to complete research surveys (Bethlehem, 2010). Such workers may be more highly learning-oriented, introspective and reflective. Our experience suggests that our data set also suffers from these biases to some extent. We observed instances, for instance, when survey participants voiced their interest in the topic, complimented our instrument in comparison to similar data collection efforts they had already participated in or indicated sympathy based on their own academic background. Further, we noticed that higher paid workers were less likely to accept our project proposals. If we assume that higher paid individuals tend to be more skilled or at least represent a certain type of freelancers, this subgroup might be underrepresented in our sample. To illustrate this point, we collected the average hourly wages noted on the freelancers' profiles on one of the platforms on which we approached the workers directly. The average hourly wage of all contacted workers was USD 32, which is comparable to the average hourly labour costs in the European Union in 2018. Those workers who accepted our proposal demanded on average only USD 28 per hour; for those who declined the figure was USD 35. One explanation for this observation could be the higher opportunity cost of contributing to our research for better paid individuals in comparison to those with a lower average wage. Beyond mere financial opportunity costs, some better paid individuals cited reputational risk as reasons for declining our offer. Adding lower paid projects from outside their domain of expertise to their project history could signal low utilisation. Similarly, some were concerned that it might lower the hourly wage displayed on their profile.

Workplace learning processes often happen without workers being aware of them (Eraut, 2007). Given that our survey results indicate that crowdworkers prefer informal learning activities over formal ones, this issue is likely to be more prevalent in crowdwork. Attending a learning workshop is easier recollected as a learning activity than searching a coding solution in an online forum. To mitigate this issue, we reminded participants to have a broad concept of learning in mind and always prompted them to consider a concrete time frame.

We ensured data quality by conducting a pilot before launching the survey, receiving feedback from workers, fellow researchers and platform providers alike, and by adapting well-tested scales that have previously been applied to similar work contexts. We received much encouraging feedback from freelancers about the clarity and structure of our instrument, a sign that these measures were successful.

We ensured the integration of qualitative and quantitative findings in the preparation of writing the final report, for instance by explicitly making time to add quantitative results to be interpreted by and discussed with the qualitative research team. In writing up the final report, we used analytical tools such as narrative summaries, thematic analysis and cross-case analysis and complemented them with the additionally generated quantitative findings from this survey (Dixon-Woods et al., 2005). This allowed for a common interpretation and synthesis across all data sources, enabling us to conceptualise policy recommendations on a more macro level perspective.

#### Data and analysis

We created seven Qualtrics versions of our survey instrument to accommodate several sampling techniques across the four platforms. We did not weight the variables as the underlying population of crowdworkers is unknown. Instead, we focused our efforts on increasing sample variation to allow comparisons of sub-groups that are interesting from the perspective of public policy. The data cleaning and statistical analysis was done using Alteryx and R, and, whenever sufficient and more economical, Microsoft Excel. Selected results are presented in this report.

### ANNEX 2. Skills typology

### A2.1. Skills developed prior to engagement in crowdwork

Skill type/subtype	Respondents	Mentions
Technical/core skills		228
Admin skills (data entry, etc.)	3	3
Advertising	1	1
Architecture	1	1
Chemistry	2	5
Computer programming	9	13
Currency (Fortrex) trading	1	1
Data analytics	1	1
Cybersecurity	3	7
Data science	1	1
Database design	2	2
Design, apps	1	1
Design, physical objects	1	1
Engineering, automotive	1	1
Engineering, civil	2	5
Engineering, industrial-business logistics	3	4
Engineering, knowledge	2	2
Engineering, mechanical	1	2
Game design	1	1
Graphic design	4	7
Illustration	1	1
Marketing (as a core skill)	8	18
Mathematics	3	3
Music, composition	1	1
Music, DJing	1	1
Music, performance	1	1
Music, singing	1	2
Music, software	1	1
Photography	2	2
Psychology/counselling	1	1

Skill type/subtype	Respondents	Mentions
Public relations	1	2
Researching info	5	6
Research, systematic literature review	1	1
SEO as a core skill	1	1
Consultancy	2	2
Securities trading, stock exchange	1	1
Using social media	4	5
Software, animation	1	1
Software, architecture	1	1
Software, GIS	3	7
Software, graphics editor	4	4
Software, non-specific	2	2
Software, spreadsheets	3	4
Software, transcription	1	1
Software, virtual reality	1	1
Software, word processing	1	1
Sound engineering	1	1
Statistics	1	1
Stenography	1	1
Storytelling	1	1
Sysadmin	1	1
Teaching	4	5
Acting	1	1
Transcription, audio	2	3
Transcription, handwriting	2	2
Transcription, medical	1	1
Translation (Dutch)	1	2
Translation (English)	7	8
Translation (French)	1	1
Translation (German)	4	4
Translation (Italian)	1	1
Translation (Japanese)	1	1
Translation (non-specific)	1	1
Translation (Portuguese)	1	1
Translation (Romanian)	1	1
Translation (Russian)	1	1
Translation (Spanish)	3	3

 Beveloping and matching skills in the online platform economy

 Findings on new forms of digital work and learning from Cedefop's CrowdLearn study

Skill type/subtype	Respondents	Mentions
Translation (technical)	1	1
Translation (translation machines)	1	1
Translation (Ukrainian)	1	1
Typing	1	1
UX/UI	1	2
Video editing	5	8
Video filming	2	4
Video production	1	1
Voice acting, recording	1	1
Web development	5	6
Writing (academic)	3	3
Writing (blog)	1	2
Writing (business, e.g. proposals)	1	1
Writing (creative)	2	3
Writing (CVs-resumés)	1	1
Writing (journalism)	5	7
Writing (non-specific)	2	2
Writing (offline articles)	2	2
Writing (online articles)	3	4
Proofreading	6	6
Language skills		61
Language skills (Catalan)	1	1
Language skills (Dutch)	2	2
Language skills (English)	22	27
Language skills (French)	8	9
Language skills (German)	6	6
Language skills (Italian)	1	1
Language skills (Japanese)	1	1
Language skills (Latin)	1	1
Language skills (Portuguese)	1	1
Language skills (Romanian)	1	1
Language skills (Russian)	1	1
Language skills (Spanish)	6	8
Language skills (Tamil)	1	1
Language skills (Ukrainian)	1	1

Skill type/subtype	Respondents	Mentions
Obtaining work on platform		17
Applying for work	4	4
Marketing, including online (as a soft skill)	3	4
Pricing own work	4	5
Using the platform (Fiverr and other)	2	3
Selling online (crafts)	1	1
Learning to learn	1	1
Communication skills		51
Communication skills	22	25
Handling cultural differences	1	2
Handling customers	15	16
Presentation skills	1	1
Teamwork	3	3
Public speaking	1	1
Speaking, performance	1	3
Personal dispositions/attributes		18
Confidence	4	4
Independence	6	6
Punctuality	2	2
Resilience	1	1
Risk tolerance	1	1
Discipline	4	4
Organisation skills		8
Project management	4	4
Time management	4	4
Analytical skills		1
		_
Computer literacy		7

Source: Cedefop CrowdLearn interviews.

### A2.2. Skills developed during crowdwork

Skill type/subtype	Respondents	Mentions
Technical/core skills		265
Chemistry	1	2
Architecture	1	1
Computer programming	10	28
Data analytics	1	1
Engineering	1	1
Engineering, automotive	1	1
Engineering, civil	1	2
Engineering, industrial-business logistics	1	1
Google AdWords	1	1
Graphic design	2	4
Marketing, as a core skill	5	26
Mathematics	1	1
Music, composition	1	1
Music, recording	1	2
Music, software	2	4
Photography	1	3
Psychology/counselling	1	1
Researching info	1	11
Research skills, systematic literature review	1	1
SEO (as a core skill)	2	10
Social media	3	5
Software, analysis	2	2
Software, audio-editing	1	1
Software, CAD	1	2
Software, data analytics	1	1
Software, design	2	
Software, GIS	1	16
Software, graphics editor	2	3
Software, non-specific	3	2
Software, spreadsheets	1	11
Software, specialist	1	1
Speaking (performance)	1	7
Statistics	1	1
Transcription, general	1	1
Translation, non-specific	3	6

Skill type/subtype	Respondents	Mentions
Translation, Spanish	1	1
Translation, technical	3	5
Translation, machine	1	1
Video editing	3	10
Voice acting/performance	2	3
Voice acting/recording	2	7
Web development	1	1
Writing, academic	2	7
Writing, blogs	1	1
Writing, branding	1	1
Writing, content	7	40
Writing, creative	1	2
Writing, journalism	1	1
Writing, online articles	1	1
Writing, product reviews	1	1
Proofreading	3	16
Writing, technical	2	3
Teaching/tutoring	2	2
Language skills		18
English accents	1	1
English	3	8
German	3	6
Spanish	2	2
Swahili	1	1
Obtaining work on platform		177
Using the platform (Fiverr)	6	8
Using the platform (other)	4	10
Using the platform (Upwork)	8	9
Applying for work	13	27
Pitching	1	2
Pricing own work	28	60
Who to trust	9	10
Marketing, as a soft skill	13	24
SEO (as a soft skill)	4	4
Self-presentation	1	23

 90
 Developing and matching skills in the online platform economy

 91
 Findings on new forms of digital work and learning from Cedefop's CrowdLearn study

Skill type/subtype	Respondents	Mentions
Setting up as a freelancer		28
Obtaining business permits	2	2
Taxes	14	22
Visas	4	4
Learning to learn	7	39
Communication skills		112
Communication	21	56
Handling customers	23	40
Handling cultural differences	8	11
Community-building offline	2	4
Team work	1	1
Personal dispositions/attributes		89
Confidence	9	32
Creativity	1	11
Empathy	1	2
Flexibility	2	7
Independence	1	1
Punctuality	1	2
Resilience	9	22
Working alone	1	3
Discipline	5	9
Organisation skills		56
Being organised	1	17
Project management	1	2
Time management	13	37

Source: Cedefop CrowdLearn interviews.

ANNEX 3.

# Typology of learning activities and strategies

#### A3.1. Learning activities

#### 1. Individual learning activities

- 1.1. Learning by doing
  - 1.1.1. working on tasks alone and reflecting on how well one did;
  - 1.1.2. learning through trial and error;
  - 1.1.3. performing new and challenging tasks
- 1.2. Self-study
  - 1.2.1. following new developments in the field
  - 1.2.2. reading up professional literature
  - 1.2.3. taking an online tutorial
- 1.3. Attending a classroom course/workshop
- 1.4. Attending an online course e.g. MOOC

#### 2. Collaborative learning activities

- 2.1. Collaborating with others on tasks
- 2.2. Asking others for advice or feedback on own work/learning
- 2.3. Observing and replicating other people's strategies

#### 3. Formal/organised learning activities

3.1. Attending courses/workshops or MOOCS

#### 4. Informal/on the job learning activities (see 1 and 2 above)

#### A3.2. Learning strategies

#### 1. Planning strategies

- 1.1. Setting up own performance standards
- 1.2. Setting up long term goals
- 1.3. Setting up short term goals
- 1.4. Devising a learning plan
- 1.5. Developing strategy of how to go about learning
- 1.6. Identifying own learning gaps before starting a work task

#### 2. Implementation/volition strategies

- 2.1. Regularly reviewing progress towards goals
- 2.2. Adapting goals
- 2.3. Adapting strategies
- 2.4. Adapting learning plans
- 2.5. Self-efficacy beliefs and strategies to foster these in oneself
- 2.6. Intrinsic motivational beliefs and strategies to foster these in oneself
- 2.7. Visualisation/imagery
- 2.8. Asking others for help
- 2.9. Collecting information from different and diverse sources rather than relying on one source
- 2.10. Blocking time for learning
- 2.11. Writing practices (diaries) or making notes/diagrams to support one's learning
- 2.12. Comparing new learning to own extant repertoire of knowledge and skills

#### 3. Reflection strategies

- 3.1. Reflecting on whether there were better ways to do a task
- 3.2. Thinking about what was learned
- 3.3. Writing up lessons learned
- 3.4. Sharing lessons learned/new knowledge/skills with others
- 3.5. Reflecting on fit of crowdwork to other work
- 3.6. Reflecting on fit of crowdwork to bigger picture of professional Development
- 3.7. Self-evaluation strategies comparing oneself to one's own previous performance; and to other people's performance/standard/expected performance



### Developing and matching skills in the online platform economy

Findings on new forms of digital work and learning from Cedefop's CrowdLearn study

Long before the outbreak of the Covid-19 crisis, questions were raised about gig and platform work: are they 'digital sweatshops' or a conduit to skills development and better skills matching? The public health crisis may have accentuated the vulnerability of platform workers, but it also demonstrated the wider potential for working and learning digitally.

Cedefop's CrowdLearn study is the first to examine skills development and skill matching practices in online platform work. It presents evidence from interviews with platform economy stakeholders, as well as crowdworkers themselves. It identifies the types of skills developed in such work and the learning practices of gig workers. It highlights the challenges (algorithmic management, limited platform portability) posed to efficient skills matching and crowdworker mobility and makes policy suggestions to overcome them.

These insights can provide useful directions for vocational education and training, asking what we can learn from those who mastered the art of digital working and learning long before the current crisis.



European Centre for the Development of Vocational Training

Europe 123, 570 01 Thessaloniki (Pylea), GREECE Postal address: Cedefop, Service post, 570 01 Thermi, GREECE Tel. +30 2310490111, Fax +30 2310490020, Email: info@cedefop.europa.eu

visit our portal www.cedefop.europa.eu



