Manchester Metropolitan University | Decent Work and Productivity Research Centre

Graduates for a Greater Manchester: The Context

Report 1: 'Tech and Creative Digital': Labour Market Trends and Graduate Skills in Greater Manchester.

April 2020

Report 2:
'Tech and Creative Digital': Patterns of Graduate Employment in Greater Manchester.

TWO INITIAL BACKGROUND REPORTS PREPARED FOR THE PROJECT STEERING COMMITTEE BY THE DECENT WORK AND PRODUCTIVITY RESEARCH AND EVALUATION TEAM.

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Executive Summary

The purpose of this report (the first of an initial two scene setting reports) is to provide stakeholders in the 'Graduates for a Greater Manchester' project with an accessible overview of the key aspects of the context of the project. We explore the labour market trends with regard to 'Tech, Creative and Digital' (T and CD), and the supply, demand and development of relevant skills. The report draws on policy and academic literature and scoping interviews with a selection of key stakeholders. The key issues emerging are as follows:

1. Greater Manchester (GM) currently has fast growing Tech and Creative clusters, with strong demand for T and CD skills
2. Skills shortages are reported, but there is also evidence of under-utilisation of skills and graduate underemployment
3. The review points to a need to integrate responses to challenges around supply and demand of T and CD skills ('Graduates for a Greater Manchester' and the School of Digital Arts (SODA) are prime examples) accordingly. Partnership between policymakers, universities and employers is crucial.
4. The role of employers is important in developing roles that demand graduate skills, and providing further skills development and routes for progression.
5. The rapid development of T and CD Sectors and skills, and some definitional uncertainties, present challenges for graduates in understanding what skills are required, and for those responsible for developing skills and advising graduates.
6. The evidence points to a developing need for T and CD skills and confidence in non-T and CD roles and sectors and these should be given due weight in interventions
7. The skills literature suggests that it is important to consider particular skills but as part of a wider skills set, rather than in isolation, and this is likely to include 'soft skills' and motivation/confidence in learning and deploying specific skills
8. This literature also suggests that skills acquisition is sensitive to context, and will depend on barriers and enablers to learning as well as individual motivations to learn
9. Skills acquisition itself is not a guaranteed route to graduate employment, and social inequalities will impact on who gets to use their skills and benefit from them.

Consideration of many of these issues is evident in the design of 'Graduates for a Greater Manchester', however it is hoped that this report will be useful in bringing them to the fore as the project takes shape over its life course.

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List of abbreviations

DCMS.....Department for Digital, Culture, Media and Sport

GM.....Greater Manchester

GMCA.....Greater Manchester Combined Authority

HESA.....Higher Education Statistics Agency

MCC.....Manchester City Council

OFS.....Office for Students

T and CD.....Tech and Creative Digital

UUK.....Universities UK

1. Introduction

The purpose of this report is to support the Office for Students (OFS)-funded project 'Graduates for a Greater Manchester' by providing stakeholders with an overview of its context – the nature of sectors which it focuses on, the supply and demand of relevant skills and the local labour market for graduates.

It has been written just as the COVID-19 crisis has emerged, with lots of questions about the economic fall-out of the health emergency, which may significantly affect the extent of and nature of demand for skills. In the report, we distil information and insights from published sources from Steering Group members (including Graduate Prospects, GMCA, Manchester City Council (MCC), Manchester Digital), and have complemented this with desk-based research from academic and policy-oriented literature. In addition, we draw on scoping interviews with a selection of Steering Group members, as well as other key regional stakeholders.

The primary audiences for the report are the staff delivering and managing the project at Manchester Metropolitan University and the University of Manchester, the project's Steering Group and other key stakeholders. We anticipate that it will also be of interest to a wider group of students, graduates and their advisers, who want to know more about this particular aspect of the graduate labour market in GM. In the report, we seek to address what the opportunities for work really are for graduates, as well as to illuminate what skills employers require. We aim to add to how the project itself contributes to creating a better understanding of the T and CD sectors in GM and what this means for graduates who want to build careers here. Our report highlights questions and challenges that emerge from existing literature about these topics.

The 'Graduates for a Greater Manchester' project is situated within both a fast-changing labour market as well as dynamic higher education policy environment. The original OFS competition for funding (OFS, 2018) responded to a context in which it is recognised that the graduate labour market in the UK is diverse and unequal. OFS policy to support the regions also aligns to a wider political commitment to support regional development as part of a 'levelling up' agenda. It has long been recognised that universities are key actors in their regions (UPP Foundation, 2019). Although GM has had a relatively buoyant labour market and a strong higher education sector, the benefits of these are unequally shared within people in the region. The OFS project that has a broad focus on the growth areas

of the T and CD industries is also concerned with supporting the graduate prospects of local graduates who often come from less advantaged backgrounds.

Many of the features of the project align with wider societal and economic changes, which stretch beyond the location of Manchester. In their Future of Work report, Nesta authors (Bakhshi, Downing, Osborne, & Schneider, 2017) identity broad themes which are: increasing inequality; political uncertainty; technological change; demographic change; globalisation; environmental sustainability; urbanisation. The impact of these themes plays out differently in different regions, although it is important to note that the labour market in GM is interconnected with a larger national, European and global whole.

The report has been created by the research and evaluation team for the project (from the Decent Work and Productivity Research Centre at Manchester Metropolitan University). It was commissioned in response to an element of the OFS Theory of Change evaluation methodology relating to Manchester Metropolitan University's Third Term project, specifically, that project seeks to be aligned to local labour market requirements in T and CD skills. However, it is likely to be of relevance to aspects of that project more broadly, and to the work taking place at the University of Manchester that aims to develop self-efficacy in the use of digital skills amongst students. It is the first of two scene-setting reports, the second of which will present an analysis of the patterns of movements of graduates into the GM labour market, and into T and CD sectors and roles specifically.

The report starts by examining the nature and place of the T and CD sectors in the economy. We then discuss the nature of the skills in T and CD fields, before examining supply and demand for such skills in the GM labour market.

2. Tech and creative digital sectors

As the project has developed from inception to reality its documentation has used varied language in relation to the labour market sectors it seeks to respond to in its design. The terms 'tech', 'creative' and 'digital' appear in most iterations and these will be the starting point for the discussion here. This variation of terminology also occurs in stakeholder publications, which is an indicator of the slippery nature of industries and roles that can be defined as 'tech', 'creative', and 'digital'.

2.1 Defining the T and CD sectors

What really are the T and CD sectors that the project wishes to focus upon? Current standard industry classifications do not readily map onto this trio of words. Pragmatically, if there is lack of clarity about what they are, this may influence the pipeline of students and graduates moving into roles in these sectors. Some existing commentary, e.g., Creative and Cultural Sector Skills (2015) has recognised how confusion about options, roles and employers can be a barrier for recruiting into emerging fields. Each of the three words – tech, creative and digital – can be initially defined separately. The creative and tech sectors can be more clearly defined as standalone and both are sectors that are being transformed by digital change. Arguably, 'digital' stands alone less readily, as digital transformation is influencing all jobs across all industries. In the context of this project however, digital pairs with both creative and tech sectors, in transforming those. One way of describing this trend is to think about 'creative digital' and 'tech digital'; the former associated with the transformation of creative production, distribution and consumption, the latter associated with the transformation of technology industry processes. Within these sectors, there are a diversity of jobs, not all of which are specifically creative, digital or tech.

The Department for Digital, Culture, Media and Sport (DCMS) (2018) defines the creative sector under nine categories. Their definitions are the most widely used in commentary on the creative industries. These categories are broad and can include diverse and contrasting jobs such as artist, musician, and architect and software developer. The terminology 'creative economy' is used to capture the creative industries and creative jobs in other industries. The nine categories are in Box 1:

Box 1: DCMS Creative Industries (2018)

1. Advertising and marketing
2. Architecture
3. Crafts
4. Product design, graphic design and fashion design
5. Film, TV, video, radio and photography
6. IT, software, video games and computer services
7. Publishing and translation
8. Museums, galleries and libraries
9. Music, performing arts, visual arts and cultural education

Estimates are that a third of people working in creative industries are self-employed (Creative Industries Federation, 2017) so though dynamic, work can be insecure. Nesta analysis predicts one million new creative industry jobs will be created in the UK between 2013 and 2030, and also estimates three quarters of those jobs will be created in ten specific regions in the UK (including Manchester) (Mateos-Garcia, Klinger, & Stathoulopoulos, 2018).

Tech Nation (2018, 2020) is the body tasked by government to develop tech digital industries in the UK. The terminology of 'tech industries' and 'tech economy' is used by them. They refer to 'digital tech', which marks a distinction from more traditional engineering and technical/technology industries. The shortened term 'tech' captures newly developing industries and employers. Box 2 includes the main fields that are included in the tech remit:

Box 2: Tech Nation, digital tech industries (2018)

1. Manufacture of computers and peripheral equipment
2. Publishing of computer games
3. Other software publishing
4. Wired telecommunications
5. Wireless telecommunications
6. Satellite telecommunications
7. Other telecommunications
8. Computer programming activities
9. Computer consultancy activities
10. Computer facilities management activities
11. Other IT and computer service activities
12. Data processing, hosting and related activities
13. Web portals
14. Repair of computers and peripheral equipment

The recent Tech Nation (2020) report is upbeat about what they call the digital technology industries. Key findings from their analysis include: the digital tech sector GVA grew nearly 6 x faster than the rest of the UK economy in 2018 – contributing £149bn to the UK economy and accounting for 7.7% of UK GVA; digital tech employed 2.9m people in the UK in 2019, an increase of 40% from 2017 (now accounting for 9% of the national workforce). A new language has developed to describe emerging fields, which include: Robotics, Artificial Intelligence (AI), Augmented reality, Virtual reality, the Internet of Things, Cybersecurity, and Blockchain.

2.2 Creative clusters

The spatial proximity of tech, creative and digital is a strong feature of the GM labour market. This interconnectedness of key industries is described in Nesta's Creative Clusters literature (Chapain, Cooke, De Propris, MacNeill, & Mateos-Garcia, 2010; Mateos-Garcia et al., 2018) which has observed patterns for over a decade now, highlighting GM as having one of the biggest clusters outside London. The Creative Clusters literature has usefully illuminated the geography of the creative industries and outlines the interdependence of what are referred to as creative industries, High-Tech manufacturing firms and Knowledge Intensive Business Services (KBIS). This analysis illustrates how these different sectors act to stimulate one another. Ten years on from observations that Manchester has the strongest creative cluster outside London, this trend seems to have continued to grow in the GM region, e.g. in Tech Nation's 2020 report, Manchester alongside London, Bristol, Oxford and Cambridge in the UK is reported as one of Europe's top 20 highest investment tech cities. Manchester is reported to be Europe's fastest growing major tech cluster with investment growth from £48 million in 2018 to £181 million in 2019 (a growth of 277%) and the city is on a par with Amsterdam for creating fast-growing tech businesses with a combined turnover of £3.2bn in 2018. Although London remains the leading city for tech unicorns in the UK, having produced 46 unicorns since 1990, Manchester[1] together with Oxford, Cambridge, Edinburgh and Bristol have produced 20.

A feature of commentary from local policymakers (Greater Manchester Combined Authority (GMCA) and MCC) is the pairing of creative and digital industries as an important aspect of the local labour market and economy. This is not something that happens routinely across other regions in the UK and represents positive opportunities for the city and its people.

Quoting from GMCA Digital Strategy 2018-2020, Harrington (2018) in a report to MCC describes the following:

> *With almost 8,000 digital and creative businesses in Greater Manchester employing more than 82,300 people and generating £4.1bn of economic growth annually, Greater Manchester is already home to the largest cluster of the digital and creative industry outside London. Manchester's digital industry has particular strengths in connectivity, broadcast and new media, digital marketing, e-commerce and cyber security. Between now and 2025, an additional 2,100 jobs will be created in the creative and digital industry within Manchester specifically.*

This positivity is founded upon the GM Prosperity Review (GMCA, 2018a) and subsequent Local Industrial Strategy (GMCA, 2019b) which we will return to.

2.3 Summary

For educators who want to align their work to buoyant sectors, there continue to be some questions about how to define T and CD sectors. Although DCMS and Tech Nation do offer useful definitions, there is a need also to consider conventional industries such as law or retail that are transforming their business practices and may have many creative digital and tech digital jobs. The strength of the industries is clear, but in a fast-changing environment many graduates may be unclear about what some jobs (for example, those associated with virtual reality or blockchain) may really involve, and what skills they need to go into this work. Greater clarity around language and definitions will be challenging in rapidly evolving labour market, but is likely to benefit to students and graduates in developing their careers, and to educators and careers advisers who help to shape them.

1 Manchester and North West – 5 Digital tech unicorns: BooHoo; AutoTrader; AO.com; The Hut Group; onthebeach.co.uk

3. The local labour market context for graduates

In this section of the report, we will firstly outline the context of the labour market for graduates in the region and go on to focus upon T and CD labour market opportunities and skills.

3.1 What do graduates do in the North West?

Across the North West region, it is not strictly the T and CD industries that have the most shortages of suitably qualified graduate candidates. Based upon the Employer Skills Survey, Prospects (2019a) analysis shows that the region has more hard-to-fill vacancies in sales (albeit many of these roles may be digital) than any other and it also has one of the most serious shortages in the traditional roles of nurses, recruitment professionals, housing professionals, youth workers and accountants. Their analysis suggests differences across the region with regard to employment demands, e.g., business services role shortages may be the consequence of the rapid expansion of business-oriented jobs markets in Manchester, Liverpool and Preston, while housing and welfare needs in less affluent parts of the region have contributed to shortages of labour in these fields. Box 3 highlights where most serious shortages occur.

Box 3: Occupational shortages in North West (Prospects, 2019a)

Nurses;

Medical practitioners;

Human resources and industrial relations officers;

Sales accounts and business development managers;

Programmers and software development professionals;

Construction prowject managers and related professionals;

Welfare and housing associate professionals n.e.c.;

Youth and community workers;

Chartered and certified accountants;

Business sales executives;

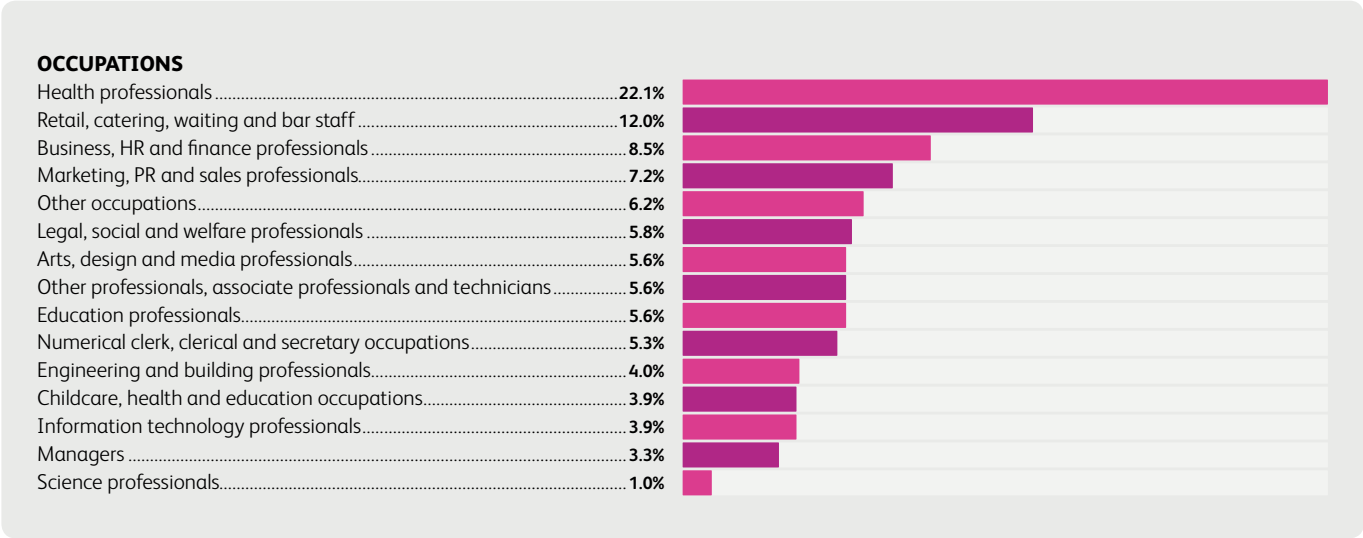
Business and related associate professionals n.e.c.;

Marketing associate professionals

Other findings from Prospects (2019b), which draw upon the HESA graduate destinations data-set illustrate that the North West as a whole, does well in retaining graduates. It retains a large portion of its graduates, with 69.4% of graduates working in the region six months after graduating having studied at a HE provider in the region. The largest amount of these were already from the region, but a fifth of university leavers continued working in the North West, despite being from another region initially. Within the North West, Manchester is home to many of these recent graduate workers and based on 2016/17 leavers of higher education nationally is third after Westminster and Birmingham in terms of numbers of employed graduates.

The HESA data also illustrates that many graduates are indeed working in fields where there are also skills shortages (see figure 1). Graduates working in T and CD roles are hard to extract from the analysis that relies upon standard occupational classifications, but this serves to remind us that although T and CD roles and industries are growing, the regional economy has much wider labour market requirements. Despite policy maker interest in the creative industries, in 2017, just 5.6% of graduates employed in the region were working in arts, design and media occupations, many of which will be working in or close by to the largest media hotspot outside of the capital (MediaCityUK), where key organisations such as the BBC and ITV are located.

Figure 1: Occupations for graduates in North West (Source: Prospects, 2019b)



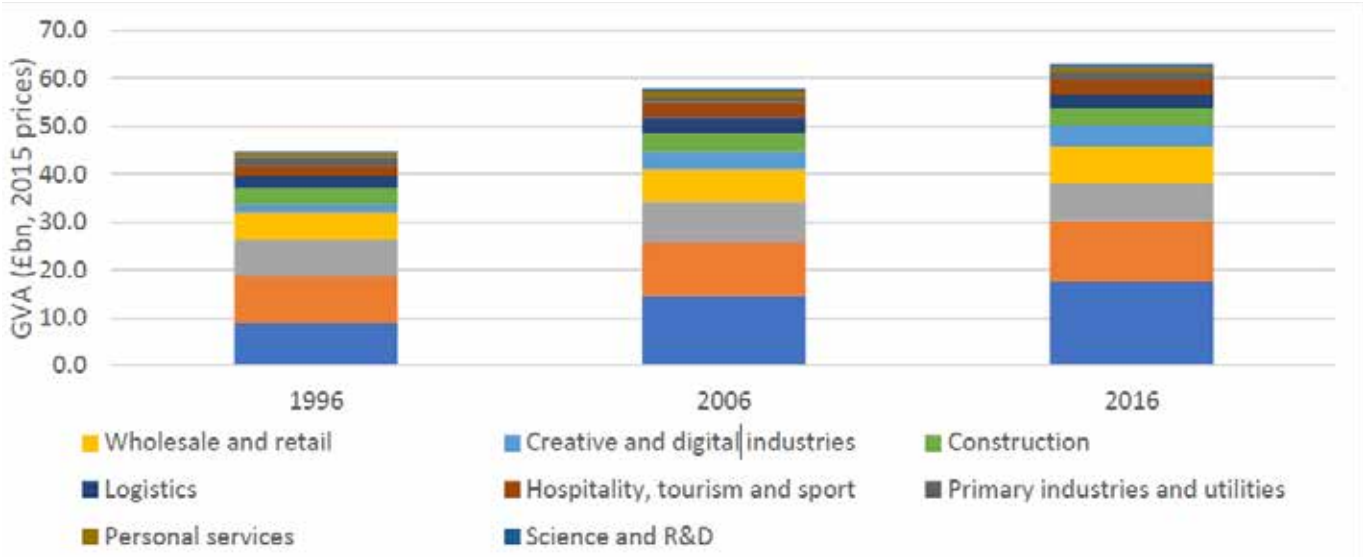
Despite the growth of opportunities in T and CD sectors, there is a great demand for other types of graduate across the region. This highlights the role higher education has for producing graduates who will move into a wide range of jobs and also the reality that in seeking labour market alignment more generally, it is sensible for 'Graduates for a Greater Manchester' project partners to work to enhance the digital skills of all graduates whatever role or sector they may need. Nurses need digital skills, as do housing professionals and sales workers, although none of these may be considered to be in either the tech or creative economy.

3.2 T and CD sector/s in GM

The Greater Manchester Local Industrial Strategy (GMCA, 2019b) is an important source in helping to understand the labour market in the area. The Strategy builds on the findings of the Greater Manchester Independent Prosperity Review's (GMCA, 2018a) detailed analysis of the local economy and the social and environmental challenges that must be overcome.

The Prosperity Review highlighted important opportunities and existing growth in what they call the 'Digital and Creative' Sector. The 'Digital and Creative' sector in Manchester and Salford is seen as a major opportunity and is led in particular by activity in Salford Quays/MediaCity UK which has an internationally significant cluster of 'Digital and Creative' activities. In addition, there is other activity concentrated in Central/East Manchester, and near Manchester Airport. The review also showed that employment in 'Digital and Creative' industries had grown by 34% in GM's town centres between 2010 and 2015 (illustrated in figure 2).

Figure 2: GM Economy Sector Breakdown by GVA – £bn, 2015 prices (GMFM, 2016), (Source: Greater Manchester Prosperity Review (2018))



Building upon the Prosperity Review, the Greater Manchester Local Industrial Strategy summarises opportunities in the labour market and makes extensive proposals for action. It is a broadly positive with regard to the labour market, although does identify areas for improvement. Digital and creative media, health innovation, clean growth and advanced materials and manufacturing are the areas of the economy considered to be 'strong opportunities'. All of these broadly align with the 'Graduates for a Greater Manchester' project's focus on T and CD sectors, though the 'Digital and Creative Media' (see box 4) component is most directly aligned to the project's purpose. Underpinning these areas of strength, the strategy has a number of underpinning foundations which are around Ideas, Places, Business Environment, People and Infrastructure. Business organisations such as pro-Manchester that works on the ground to support business development confirm the dynamism and expansion of the labour market within creative and digital tech, which offer many opportunities for new graduates. For example, in the city, the rapid development of specific fields within tech are borne out in emerging fields, most notably Fintech, Gaming tech, Greentech and Healthtech.

One of four major opportunity areas for growth in the Local Industrial Strategy is 'Digital, Creative and Media'. This directly connects to the 'Graduates for a Greater Manchester' project. This excerpt from the strategy in Box 4 highlights the city region's position.

Box 4: Opportunities in Digital, Creative and Media (Source: Greater Manchester Local Industrial Strategy, p.46)

Greater Manchester has the largest digital and creative sectors outside the south east, with the potential to create internationally significant clusters in broadcasting, content creation and media and cyber security, alongside new sub-sectors like e-commerce where the city-region has the potential to lead industries of the future. The explosion of the data and digital economy over the past decade is enabling growth across the economy, and has the potential to transform public services to support improved productivity. At the same time, cross-cutting digital strengths will accelerate the use of productivity enhancing digital technologies and big data in all sectors to meet the Artificial Intelligence and Data Grand Challenge. Through this Local Industrial Strategy Greater Manchester aims to build on its position as a leading European digital city region, to maximise growing assets in cyber security and capitalise on the links between digital, creative and other industries in the city-region that feed innovation in broadcasting, content creation and media, as well as in e-commerce, fintech and other new technologies. Greater Manchester will take a Made Smarter approach to all industries, supporting firms to adopt new digital and creative techniques and enabling the digitalisation of all sectors.

Greater Manchester will also continue to support the growth of creative and media clusters in the centre and throughout the city-region. Greater Manchester and government have already invested in the city region's digital infrastructure, creative and media infrastructure and committed to a new cyber security Centre of Excellence in the city-region that will create hundreds of high-skilled jobs.

Greater Manchester's £3m Digital Skills Pilot, agreed at the 2018 Budget, will see the city-region and government work together to boost digital skills.

However, the Prosperity Review authors also identified a misalignment between learning provision and sector requirements most clearly in Digital and Creative, and Business and Professional Services. This argument echoes of existing academic work about the problematic relationship between creative education in particular and the creative industries in particular (Comunian, Faggian, & Li, 2010), and fears of over-supply and under-utilisation of graduates. These graduates are a complex group to evaluate given the high levels of self-employment in these fields of work, though suggests interesting questions for educators in creative disciplines in how best to equip graduates for the growing digital demands of the creative industries. The new School of Digital Arts at Manchester Metropolitan University is well-placed to respond to these concerns.

The local industrial strategy responds to this with numerous policy aspirations with regard to people and skills. A specific one is – 'a skills and work system that enables people to realise their potential, supports emerging industries and is responsive to employers'. Universities and the education they provide are part of this process of creating a skilled workforce, although it is notable that reports from both GMCA and MCC, often focus on ensuring the upskilling of people at the lower end of the labour market rather than university graduates. However, it certainly appears that the 'Graduates for a Greater Manchester' project aligns with the local industrial strategy's commitment to ensuring a skilled and qualified workforce, that can respond to high tech and digital needs.

The Prosperity Review highlighted the fundamental link between skill levels and productivity. GM has seen significant improvements in its workforce qualification profile over the last decade, but the city-region's skills profile still lags behind national benchmarks. It identified many strengths in GM's education

and skills system, but concluded that it remains fragmented and is delivering less than the sum of its parts. The reviewers' concern is that sometimes high skilled labour is under-utilised and argue that productivity is being significantly limited by low demand for skilled labour and poor skills utilisation by businesses and in the public sector. This feeds into a wider national debate about a traditional over-emphasis in policy on the supply of skills at the expense of demand. Providing a pipeline of skilled entrants to the labour market is clearly crucial, but this will not in itself drive productivity or lead to satisfying working lives if employers do not create demand for skills through good job design, staff development and routes to progression (Atkinson, Lupton, & Crowley, 2019; Payne, 2017). The Prosperity Review recommended taking an integrated approach, like GM and government are already applying in health and social care, to create a single education, skills and work system for the city-region which can responds to the high skills required in emerging industries. GMCA (2016) has given clear priority to skills supply and productivity for many years (see Box 5).

Box 5: Source: GMCA Work and Skills Strategy, 2016

Our vision is that, by 2035, the Greater Manchester city region will be one of the world's leading regions, driving sustainable growth across a thriving North of England. It will be ever more productive, innovative, creative, known for the excellent quality of life enjoyed by our residents who are able to contribute to and benefit from the prosperity that growth brings. Greater Manchester needs a work and skills system which ensures that young people leave education ready to succeed in the labour market, that adults have access to the skills and support they need all the way from entering the labour market through to highly skilled employment, and which is flexible, resilient and adaptable enough to meet employers' needs for improved productivity and growth. This will be delivered via an integrated work and skills system which has the needs of GM's employers – particularly in our growth sectors – and residents at its heart.

The need to understand the specific skills needs and dynamics of GM's main growth sectors (in particular Manufacturing, Financial and Professional Services, Digital and Creative Industries, and Health Innovation), as well as the sectors which support and enable that growth, and sectors in which specific skills gaps and shortages are reported

An exclusive focus on reforming the skills supply system will be insufficient – supporting businesses to move up the value chain will also enable skills performance and boost productivity, thereby improving skills performance and helping GM firms to innovate and compete.

There are numerous examples of GM and university partnership activities (GMCA, 2018b) and the 'Graduates for a Greater Manchester' project sits within this context. Examples of central and local government investment that include higher education are:

- £15m investment in the International Screen School at Manchester Metropolitan University (now known as School of Digital Arts (SODA);
- £5m investment in the Greater Manchester Cyber Innovation Hub;
- £10m towards the Greater Manchester Life Science Investment Fund;
- £5m investment in the Graphene Engineering and Innovation Centre at the University of Manchester;
- Significant investment in Enterprise Zones at Airport City focusing on advanced manufacturing, industrial biotech and pharmaceuticals and healthcare and the Oxford Road Corridor focusing on life science, health innovation and med tech.

3.3 Securing decent work in GM – challenges for T and CD

The Alliance Manchester Business School's (AMBS) Just Work reports (Grimshaw, Johnson, & Cartwright, 2017; Johnson, 2017) provide a more measured perspective to the more positive commentary from that which emerges from

policy makers and employer groups about the local labour market. They observe the role of technology as a negative that can contribute to erosion of work and creative sector jobs, which can often be precarious. They highlight the high number of freelance and self-employed workers in the creative industries in GM (35%) and that high tech, digital and creative jobs are clustered in certain locations – not the whole of GM.

They point out the risk of focusing economic development on the high tech digital and creative industries, since many of workers in the relatively deprived boroughs do not yet have the skill sets to take advantage of these better paying jobs. They also point out that the creative industries still do not offer the progression opportunities that are available in London, and the freelance nature of many roles can be a barrier to ongoing skills development.

> *This city region glass ceiling appears to be especially problematic in the arts and digital/creative industries because of the lack of arts jobs in the region compared to London and the short-term nature of contracts in digital/creative (which are predominantly SMEs) which generate obstacles for young people seeking to develop their skills over several years with a secure employment contract (Grimshaw et al., 2017, p. 12).*

They welcome the dynamic changes in the economic and political environment of GM with major new investments in industrial and creative hubs promising high skill and high paid jobs, as well as the new Mayor and the devolution deal with central government. However, they also write that GM faces challenges in common with broader national trends, including a stagnation in real wages and a rise in precarious forms of employment, especially worrying in connection with the platform or 'gig' economy and exploitative self-employment contracts. The AMBS reports highlight positive moves such as the development of the GM Employment Charter and infrastructure commitment to supporting lower skilled workers and the role of the new Mayor offers optimism for the region. However they also warn us to be wary of worsening work conditions for many people, and the challenge to ameliorate the situation.

> *Secondary data and interviews with key stakeholders reinforce this notion of polarisation and fragmentation within the Greater Manchester labour market, with a persistent gap between the prospects and material conditions of work experienced by different communities, sectors and workforce groups. At a fundamental level, alongside issues of high structural unemployment and low wages in some parts of the city region, there remains the significant challenge of upholding the core principles of fairness, justice and dignity in the workplace in a context of public and voluntary sector retrenchment and economic turbulence. These challenges are recognised in policy debates emerging around notions of inclusive growth, the efforts to ensure a fair distribution of the benefits associated with economic regeneration, and to promote job quality alongside job creation (Johnson, 2017, p. 2).*

3.4 Summary

The buoyant T and CD sectors in the city region offer an excellent opportunity for future graduate employment, and create opportunities and challenges for educators and policy makers. However, there is a paradox that employers are concerned with an inadequate supply of appropriate skills, but at the same time, there is evidence of graduate under-employment and enduring discourses around an over-supply of creative graduates. This speaks to the need for a greater integration of supply and demand in policy initiatives, as recognised in the GM Prosperity review, and that specific higher education initiatives such as the development of SODA can play a part in addressing. Indeed, the 'Graduates for a Greater Manchester' project, which involves employers and other stakeholders in shaping skills supply is a good example of an initiative that seeks to integrated supply and demand. It also points to the need for sufficient attention to be paid to the demand side of skill in the T and CD sectors, working towards

more informed engagement with graduate labour market, improved skills-utilisation, staff development and progression routes – and to provide good work. This is a particular challenge in the current context, as many T and CD businesses are small (and often young) and don't necessarily have the resource, HR expertise or support that would be required. Initiatives such as the GM Good Employment Charter, and its supporters' network, are positive developments, but inevitably will not touch all organisations in these sectors, and the high levels of self-employment present an additional challenge in this regard.

A second issue is around focus of interventions. The is challenge for educators and other stakeholders to find clarity and an appropriate balance between developing skills for roles in the T and CD sectors, and developing T and CD skills and confidence for jobs in other sectors that will increasingly require them. There is already evidence of creative graduates moving into 'non-creative' sectors, bringing relevant approaches and problem-solving skills to the table. Many will have high-level digital training/skills that can be re-purposed, though those graduates may need guidance in order to make such a shift away from an original ambition.

4. Skills – Tech and Creative Digital

In this section of the report, we explore what is known about the shortfall of graduate skills relating to tech, creative and digital. We highlight work that indicates what digital skills are most in demand, but also argue that it is important to address digital skills across the whole economy. Finally, we summarise helpful critiques of an over-emphasis on skills in discussion about graduates going into the job market.

4.1 Is there a shortfall of T and CD graduate skills in GM?

In a report to MCC's Work and Skills Board, Harrington (2018) reports on the Manchester Digital 2018 Audit report (2018) which found that 70% of businesses hired graduates but only 13% believed graduates have the right soft skills and technical knowledge to be work ready. Three quarters of respondents also felt that there was not enough industry intervention in education to prepare young people for digital and tech careers. Despite their mention of soft skills, Manchester Digital's research is mainly about absence of tech skills and a shortage of graduates for tech roles such as programmers and software developers. This shortage of suitably qualified graduates is echoed in national findings from the Institute of Student Employers (ISE, 2019), whose members face serious shortages of staff in IT programming and development, engineering, technical and analytical roles and IT in general. 22% of their members were concerned that it will become more difficult to find IT programmers and developers over the next 5 years. Higher level apprenticeships are one educational development that has been designed to address some of the issues highlighted here, with involvement of industry bodies/employers at their core.

However, other analysis paints a slightly different picture about skills supply. New Economy (2017) research in GM highlighted a paradox of the skills formation system: although employers demand higher skill levels, there continue to be issues of poor utilisation and a potential mismatch once those skills are created.

In their analysis, the number of people qualified to level 4 had risen considerably faster than the numbers of 'level 4 jobs' in the economy, resulting in an expanding gap over the last decade. In 2015, they report that this meant there were 44% more people qualified to level 4 and above in GM than jobs available requiring those skill levels. There is a paradox of graduate underemployment alongside employers complaining of lack of skills etc. This can be only partially explained, and how different roles are defined as Level 4 jobs may be part of the problem, e.g. certain roles that are considered entry level for a graduate gaining experience such as being a teaching assistant or a runner in the media may not be classified as level 4 jobs.

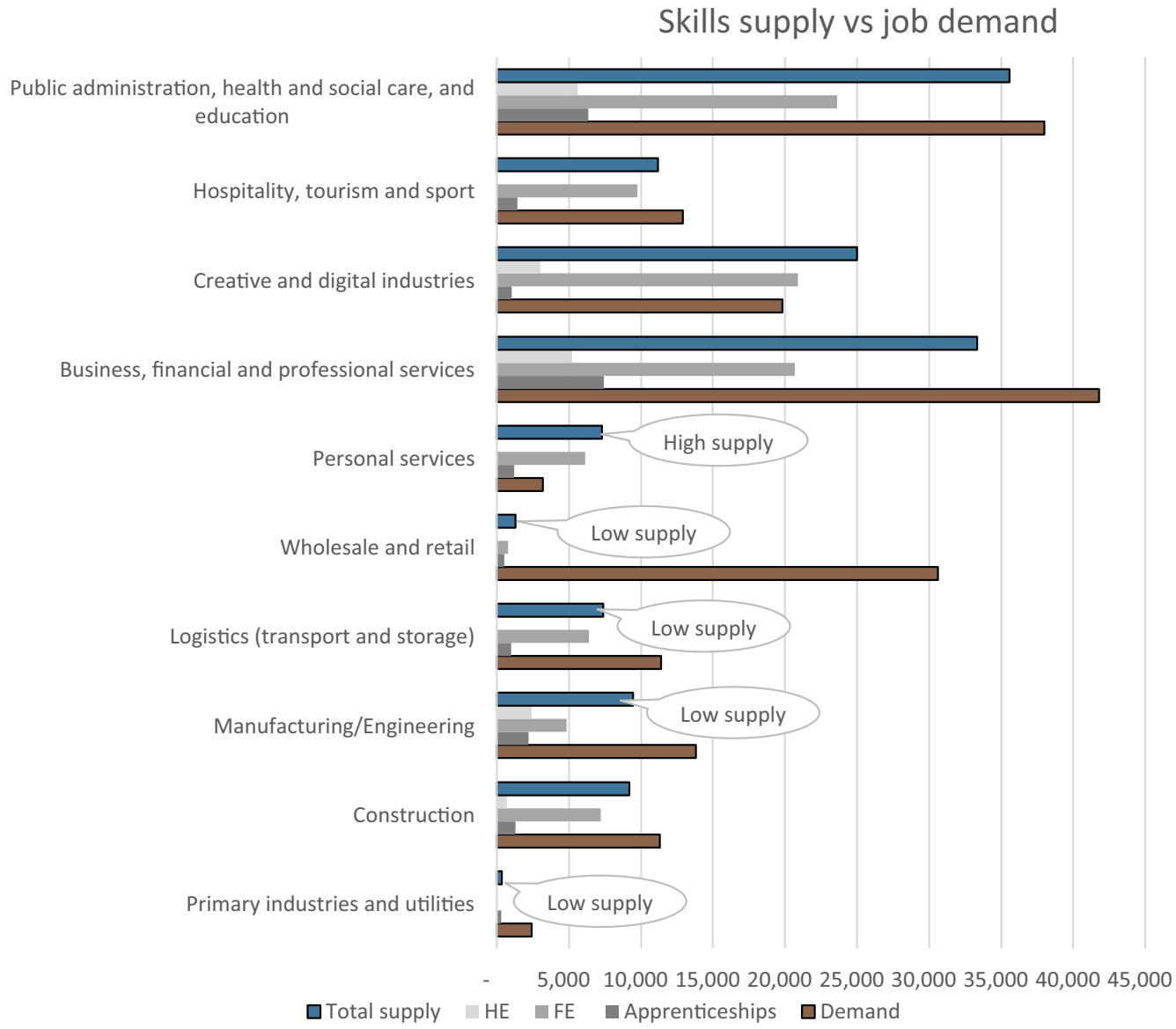
Previous research on regional differences in labour market structures explore contrasts for both underemployment and unemployment. They argue that several of the sub-regions and cities of the north of England also suffer an entrenched and comparatively high level of underemployment and over-education. This runs alongside higher unemployment in these regions – suggesting that unemployment and underemployment run alongside each other as part of broader labour market problems. Rafferty et al. express the concern that:

> *Levels of non-graduate employment among graduates remain comparatively high in the North of England compared to London and the rest of England generally. Tentatively, this may suggest a particular underutilisation of the skills and talent of the workforce in the Northern regions (Rafferty, Rees, Sensier, & Harding, 2013, p. 160).*

In a recent update on the New Economy work – Greater Manchester Labour Market and Skills Review 2018/19 (GMCA, 2019a) illustrates problematic issues around interpreting supply and demand of skills in the labour market. Figure 3 below appears to contradict the Manchester Digital survey, as there is a better supply of skills from further and higher education for the creative and digital industries than there is demand. In this review, there is greater concern with the skills of those with fewer qualifications, rather than graduates. GMCA present the HE graduate supply in GM as one of its strengths. The authors of the review argue that analysis is complex, but with regard to technical skills, it is manufacturing and engineering that has a weaker supply of skills relative to employment opportunities. The review also indicates that some 43% of firms have staff who are overqualified for the work that they do in GM – a fractionally higher proportion than in England (this includes individuals at all qualification levels, not just graduates). Meanwhile just 7.3% are 'under-utilised in their current job' – meaning they have skills and qualifications above the level needed to undertake their current role (lower proportion than in England as a whole 8.5%). Figure 3 below illustrates that there appears to be a good supply of graduates for the creative and digital industries, though less so for hi-tech fields in manufacturing/engineering.

Therefore, there is a contradictory picture about whether graduates are not suitably qualified on entry to the labour market in T and CD sectors. The Greater Manchester Labour Market and Skills Review is based on the large-scale Employer Skills Survey so draws upon a greater number of employers. However, the Manchester Digital research would suggest that subjective responses from some employers illustrate that they observe a deficit certainly in terms of tech skills.

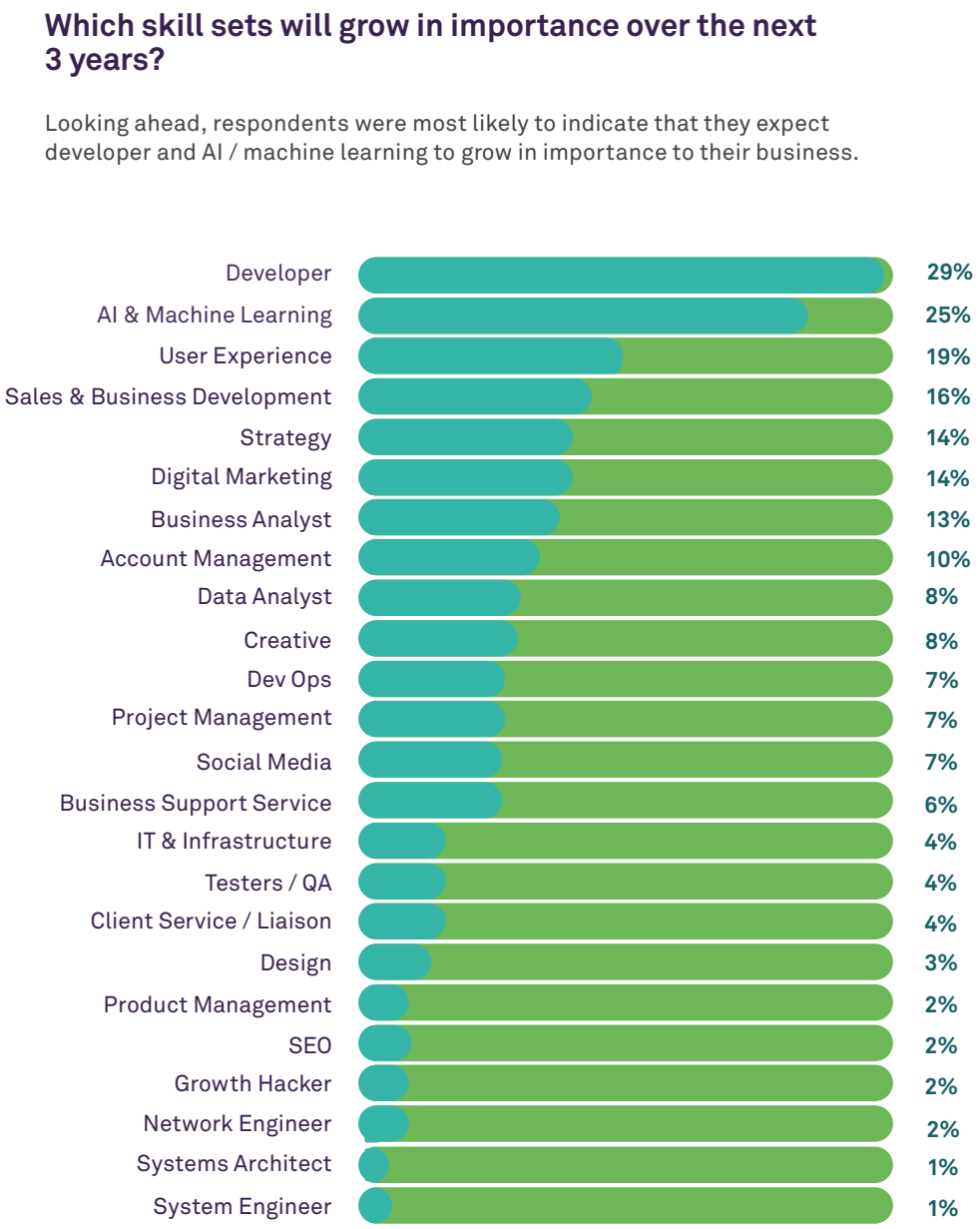
Figure 3: Skills supply vs job demand
(Source: GM Labour market and skills review, 2020, p.11)



4.2 In demand digital skills

There has been recent work that reveals what digital/tech skills are really needed and in short supply in the labour market. Nesta (Djumalieva & Sleeman, 2018) have created a detailed and comprehensive list, and Manchester Digital (2019) report on local digital tech skills shortages (see figure 4). A shortage of digital skills is a concern in GMCA's Blueprint strategy (GMCA, 2020) which situates this within wider aspirations about Manchester as a digital city with a suitable high-tech infrastructure and connectivity (e.g., £23.8m in has been invested in Local Full Fibre Network funding to improve broadband connections).

Figure 4: The growing need of digital skill sets (Source: Manchester Digital, 2019)



Although the emphasis in many lists tends to be about specific digital tech skills and jobs that use these, the analysis from Nesta also points us to consider how digital and tech skills interact with other skills and abilities, e.g., problem-solving and creativity are highlighted as of considerable importance in non-routine work which has digital outputs. Such analysis aligns with arguments elsewhere. Universities UK (UUK) (2018) argue that it is not just specific tech skills that are needed but a broad-based higher level skillset which higher education can to equip individuals for future lifelong learning; and have a flexible definition of the word skills to incorporate range of skills, knowledge attributes. In a similar vein, creativity is also highlighted in RSA (Dellot, Mason, & Wallace-Stephens, 2019) work which predicts that is jobs where creativity is required are less at risk of automation. Additionally, the OU also (2019) argue that it is the ability to apply higher-level problem solving and creativity to in the application of digital and tech skills.

In their work on the future of skills, Nesta (Bakhshi et al., 2017) focus on how different skills complement one another. They place a strong emphasis on interpersonal skills, higher-order cognitive skills and systems skills (P.14). They define systems thinking as the ability to recognise and understand socio-technical systems – their interconnections and feedback effects – and choose appropriate actions in light of them. In their work on uncovering skill complementarities, they have developed a model to identify how the skill content of occupations can be varied to improve the odds that they will be in higher demand. They analyse 'complementary skills' in so far as their impact on demand is conditional on the other skills that make up the occupation. Their findings are that the complementary skills that are most frequently associated with higher demand are customer and personal service, judgement and decision making, technology design, fluency of ideas, science and operations analysis.

4.3 Demand for digital skills in the wider economy

A number of reports illustrate that digital skills are required across the workforce, not just the T and CD sectors. The 'Graduates for a Greater Manchester' project is well positioned to respond to this labour market need, more so perhaps than its ability to add to the next generation of software developers and computer programmers.

A recent EU report usefully defines digital skills (Pabollet, 2019) as:

> *Digital competence involves the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking.*

Like many other commentators, the EU research does not consider digital skills as a standalone and they are paired with 'non-cognitive skills' which they consider are even more important. They define the latter as: 'soft skills, personality traits, character skills, human literacy, 21st century skills, life skills, key competences, or social and emotional skills'.

Recent analysis from Prospects (2019a) analysed skills shortages that most relate to the graduate labour market. Drawing upon the national Employer Skills Survey, the Prospects analysis explores professional, managerial and associate professional jobs which are the jobs that are broadly considered to be graduate level (as per SOC codes). The research looked at data about people in all these roles, not just graduates who may have recently entered the job market. This work clearly illustrates that tech and digital skills (which include what they refer to as advanced or specialist IT skills) are considered a skills shortage by many employers across a range of occupations.

Figure 5 illustrates this in relation to professional occupations. 30.8% of employers report skills shortage of Advanced or specialist IT skills in applicants for roles.

Figure 5: Technical/Practical skills found difficult to obtain from applicants for professional jobs (Source: Prospects 2019a)

TECHNICAL/PRACTICAL SKILLS FOUND DIFFICULT TO OBTAIN FROM APPLICANTS FOR PROFESSIONALS	
Specialist skills or knowledge needed to perform the role	**69.7%**
Solving complex problems requiring a solution specific to the situation	**40.5%**
Advanced or specialist IT skills	**30.8%**
Knowledge of products and services offered by your organisation and organisations like yours	**30.6%**
More complex numerical or statistical skills and understanding	**24.9%**
Knowledge of how your organisation works	**24.2%**
Writing instructions, guidelines, manuals or reports	**18.3%**
Reading and understanding instructions, guidelines, manuals or reports	**16.0%**
Computer literacy/basic IT skills	**15.3%**
Basic numerical skills and understanding	**12.0%**
Communicating in a foreign language	**11.9%**
Adapting to new equipment or materials	**11.8%**
Manual dexterity	**6.2%**

4.4 Looking beyond skills

Of relevance to the 'Graduates for a Greater Manchester' project is work that also questions and qualifies a preoccupation with skills. It is important to note that a recent review of relevant research has argued that the motivation to learn new skills is critical for individuals in undertaking new learning, such as building up tech and digital skills. Hughes et al (2019) argue that goal-setting and self-reflection are important in motivating learners. They align this with a large body of work around career adaptability, which is an expansive concept with addresses individuals' ability to adapt to changing work contexts. For educators then, it is valuable to consider ways to ensure learners are motivated to learn new skills. A career adaptability informed approach can support this, e.g. encouraging learners to consider what goals they have in relation to learning new digital/teach skills. The ownership of the whole project by careers service staff is therefore opportune as a way to frame how effective career planning can motivate and support learners in learning digital skills.

Finally, there is a very serious and long-standing critique in academic literature about claims regarding the development of skills for students, and whether these can ever transfer straightforwardly into the labour market. Sociological analysis (Bathmaker et al., 2016) has pointed out how factors such as gender, ethnicity, socio-economic background impact upon transitions into the labour market. Certain groups may face structural disadvantages that include the unconscious biases of different employers, as well as lack of confidence that certain careers or new skills are possible to attain. The competitive nature of the student and graduate labour market is widely recognised to be unfairly biased against some groups. Tomlinson (2017) has useful adapted some sociological analysis using the language of 'capitals' to highlight how graduates have different capitals which include human, social, cultural, identity, psychological. The skills agenda risks an over-emphasis on human capital investment as the solution to all labour market needs. Other useful critique has come from Leonard Holmes (2013) who critiques both the possessive obsession with skills as well as sociologists preoccupation with positioning, and he argues for a graduate identity approach, what he calls processual, as the gradual process in which individuals through engagement with a range of others develop a sense of who they are.

4.5 Summary

Educators in universities seeking to align initiatives to labour market requirements need to be aware of different ways of interpreting skills supply and demand issues. Looking for ways for universities and employers to work together on relevant training needs is sensible and for all parties to realise the role they can play in skills development. The rapid development of digital and tech skills' requirements means that it is likely that graduates will need further training when they start work. Interventions such as the 'Graduates for a Greater Manchester' project will represent an important starting point for students' skill development but will need to form part of a wider strategy to address labour market skills shortages.

It does appear that despite a preoccupation from some employers and others specifically about digital and tech skills, the wider literature points out that such skills will usually be part of a broader skill set. Shortages of graduates for specific technical occupations do seem to be a very real concern but is a different issue for educators than the aim of enhancing the digital and tech skills of students on non-specialist degree courses. However, it is possible that exposing non-specialist students (e.g. Psychology, History, Fine Art) to more tech and digital skills, a small number of these may choose to re-direct careers into technical occupations.

These are important issues for the 'Graduates for a Greater Manchester' project leaders in managing the expectations of different stakeholders. Pragmatically, a return to the mainstream graduate employability literature may be useful in capturing the breadth of different skills that are required by employers. A recent review of the employability literature provides a helpful summary of these (Artess, Hooley, & Mellors-Bourne, 2017) (see appendix 1).

This review of skills literature gives substantial attention to tech and digital skills and how they are positioned within wider skillsets. This responds to what is a preoccupation in recent writing on these subjects. Interestingly, creativity continually appears as important, so it is important for educators in the project to reflect upon opportunities to foster creativity in addition to learning specific tech and digital skills. Other important questions relate to the importance of motivation to learn new skills, including the role of career adaptability, goal setting and self-reflection (Hughes et al., 2019) and the interaction of digital skills with creativity and problem-solving (OU, 2019). It is also important to consider that it is not just tech, creative, and digital employers that want digital skills (Prospects, 2019a). We question whether some of original aims of the project to align to these sectors could be productively expanded upon in recognition of this.

5. Conclusion

This report has provided an overview of the graduate labour market for tech, creative and digital skills in the region, and a discussion of the nature of those skills and their supply. Although tricky to define and rapidly evolving, these 'sectors' are clearly buoyant in GM and the development of relevant skills by local Universities will be a key part of alleviating skills shortages and driving economic growth and opportunities for graduates. Furthermore, there is likely to be an increasing demand for T and CD skills in non-specialist graduates entering non-T and CD roles and sectors. However, reports of graduate under-employment and under-utilisation of graduate skills (paradoxically, alongside concerns about skills shortages) point to a need for greater integration of supply and demand for skills in these areas.

'Graduates for a Greater Manchester', with its involvement of employers and other stakeholders in design and delivery, is well placed to play an important role here, but this will need to be part of a wider regional strategy. Employers will play a key role, in designing roles and progression opportunities, and providing in-work development, in order to offer employment that utilises graduate skills fully, provides fulfilling careers and generates future demand for graduate-level skills. The more closely that employers, Universities and other stakeholders can work together to face these challenges and create opportunities the better. The new School of Digital Arts (SODA) has also sought to adopt this approach.

The report also points to a need to consider 'skills' in their wider context. T and CD skills are best not considered in isolation, but as part of wider skillsets that employers value. In addition, confidence to develop and apply, for example, digital skills may be as important for many non-specialist graduates as the acquisition of the 'skill' itself. The literature also suggests that educators need to focus on the enablers and barriers to skills acquisition, the motivation to acquire them and the processes by which they are acquired. Inequalities in accessing employment, resulting from social and labour market inequalities, are another important contextual factor to consider. More generally, greater clarity around the nature of T and CD skills, and awareness of developing roles and skillsets and the demand for them, will best enable those who teach and advise graduates to focus their activities and connect with their audiences.

Finally, it is hoped that this report has provided useful context for the 'Graduates for a Greater Manchester' project, and identified some challenges and opportunities that will enable stakeholders to shape the project as it develops.

Appendices

Appendix 1 – Employability/Graduate attributes

A composite list of graduate attributes (Artess et al., 2017).

Graduate attributes	
Aspiration	Numeracy
Autonomy	Opportunity awareness
Career management	Positive attitude
Communication skills	Presentation skills
Creativity	Problem solving
Critical thinking skills	Professional knowledge
Customer awareness	Research skills
Digital literacy	Resilience Self-management
Efficiency	Social intelligence
Emotional intelligence	Team-working
Enterprise and entrepreneurship	Time management
Ethics	Willingness (and capability) to learn
Flexibility and adaptability	Work ethic
Giving and receiving feedback	Writing skills
Independent thinking	
Initiative and self-direction	
Inter-personal skills	
Language skills (particularly second language skills)	
Multi-tasking	

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