THE

DIGITAL LITERACY IN THE UK

EMPLOYER PERSPECTIVES AND THE ROLE OF HIGHER EDUCATION

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> **Universities must be at the centre of this national movement to create the next generation of highly skilled, adaptable, innovative, and digitally literate graduates entering the workforce.**

In the resulting wake of the COVID-19 pandemic the accelerated transition to a digital world economy has exacerbated the already growing digital divide in many communities. As students, families and workplaces were thrust into operating almost entirely via digital means, gaps in digital literacy have been exposed.

Predictions of the rate of transition towards a global digital economy have been torn apart over the past year. The response from education institutions to facilitate development of higher levels of digital literacy has never been more crucial.

Our analysis of the current state of digital literacy across the UK highlights two things. Firstly, the importance placed on digital literacy by UK employers. Agnostic to sector, employers already recognise how vital digital literacy is to the productivity and progression of their organisations. Secondly, that there is a lot more in the UK that needs to be done. Universities must be at the centre of this national movement to create the next generation of highly skilled, adaptable, innovative, and digitally literate graduates entering the workforce.

Phil Baty
CHIEF KNOWLEDGE OFFICER
TIMES HIGHER EDUCATION

The UK is in the midst of the Fourth Industrial Revolution. To thrive and reap the benefits of digitalisation and new technologies, businesses need a workforce that is digitally literate.

DIGITAL LITERACY CAN BE DEFINED AS *"THE POWER TO USE DIGITAL TOOLS TO SOLVE PROBLEMS, PRODUCE INNOVATIVE PROJECTS, ENHANCE COMMUNICATION, AND PREPARE FOR THE CHALLENGES OF AN INCREASINGLY DIGITAL WORLD."*

Though a definitive measure of digital literacy has not yet been agreed, there are signs of a shortage of digital literacy among the UK workforce:

- The OECD's Survey of Adult Skills placed England and Northern Ireland below the OECD average for digital literacy

- Two thirds of UK businesses have unfilled digital skills vacancies (The Confederation of British Industry)

- A third of all skill-shortage vacancies for Managerial, Professional, and Associate Professional roles are caused at least in part by a lack of digital skills (Department for Education's Employer Skills Survey 2019)

- 56% of UK employers report a need to improve digital skills in their organisations to keep pace with technological change (Open University Business Barometer)

The UK higher education system has an important role to play in developing the skills, adaptability and mindset that goes with being digitally literate and, in doing so, produce graduates for a workplace that is fast being transformed by technology.

"DIGITAL LITERACY IS AN ABSOLUTE REQUIREMENT."
MIKE DERI SMITH, HEAD OF DIGITAL AT CHANNEL 4 NEWS

"NEW TECHNOLOGIES WILL CONSTANTLY EMERGE AND THAT IS WHY THE FOCUS NEEDS TO BE ON DIGITAL LITERACY WHICH IS AS MUCH ABOUT ATTITUDES AS IT IS ABOUT SKILLS."
HENRIETTA MBEAH-BANKAS, HEALTH EDUCATION ENGLAND

"TOO MANY PEOPLE THAT THINK DIGITAL CAPABILITIES ARE SOMETHING THAT YOU ACQUIRE AFTER INITIAL STUDY AND TRAINING, RATHER THAN SOMETHING THAT FUNDAMENTALLY CHANGES THE NATURE OF THOSE PROFESSIONAL SKILLS."
NICOLA PEARSON, CENTRE FOR DIGITAL BUILT BRITAIN

DEFINING DIGITAL LITERACY

The UK is in the midst of the Fourth Industrial Revolution with digital technology touching nearly every industry and job function.[1] Whilst digital technologies can facilitate innovations and improve productivity, they are in many ways essential for businesses to survive in today's digital world. This has been starkly evident during the COVID-19 pandemic with an estimate that half of small businesses in the UK would have ceased trading altogether without having access to, and the skills to harness, digital technologies.[2]

More than just survive, however, to thrive and reap the benefits of digitalisation and new technologies, businesses need a workforce that is digitally literate and able to utilise and keep pace with technological innovation.[3] Whilst today's students have grown up in a digital society it does not mean they are inherently digitally literate.

Universities have an important role to play in developing digital literacy among students, not least to enhance their employability. Indeed, a UNESCO report in 2011 highlighted that digital literacy improves one's employability because it is considered a gate skill, demanded by employers when they first evaluate an applicant's suitability for the role.[4]

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> **Digital literacy can be defined as the power to use digital tools to solve problems, produce innovative projects, enhance communication, and prepare for the challenges of an increasingly digital world.**

WHAT IS DIGITAL LITERACY?
Whilst it has been a topic of much discussion over the past decade and more, there is no single universally accepted definition of digital literacy. There is agreement, however, that much like how the concept of literacy goes beyond the mere ability to read, digital literacy is more than just the ability to operate a computer or master a particular technological tool. As Paul Gilster, a pioneer in the use of the term digital literacy, wrote in his 1997 book about the topic "digital literacy is about mastering ideas, not keystrokes."[5]

Early in the previous decade, definitions mooted by practitioners within the field attempted to capture this by referring to a variety of digital skills and competencies that comprise digital literacy. For instance, in 2011 UNESCO described digital literacy as comprising a set of basic skills required for working with digital media, information processing and retrieval, participating in social networks for knowledge creation and dissemination, and a wide range of professional computing skills.[4]

More recently, there has been explicit recognition of digital literacy incorporating higher order cognitive skills – such as critical thinking, synthesis, and analysis – as well as attitudes and mindset towards technology and digital innovations. For instance, a digital literacy framework produced by the Joint Information Systems Committee (Jisc), incorporates components such as various literacies (information literacy, media literacy and data literacy), digital creation and innovation, digital collaboration, and digital wellbeing.[6]

Adobe, a leading provider of digital document, creative, and marketing technology, defines digital literacy as "the power to use digital tools to solve problems, produce innovative projects, enhance communication, and prepare for the challenges of an increasingly digital world." This definition captures the multifaceted nature of digital literacy and is one that can be applied in different contexts, be it educational, in the workplace, or for everyday life.

Whilst there has been much talk of how technology and digitalisation will likely displace some jobs through automation – the Office for National Statistics estimates that 7.4% of jobs in England are at high risk[7] – they will necessarily change the jobs of those workers who remain.[8] The qualities of being adaptable and agile that are inherent in being digitally literate seem likely to equip such workers with the qualities needed to adjust and prosper in an increasingly digital world of work.

This leads one to question what the current state of digital literacy in the UK is? This is something we explore in the next section.
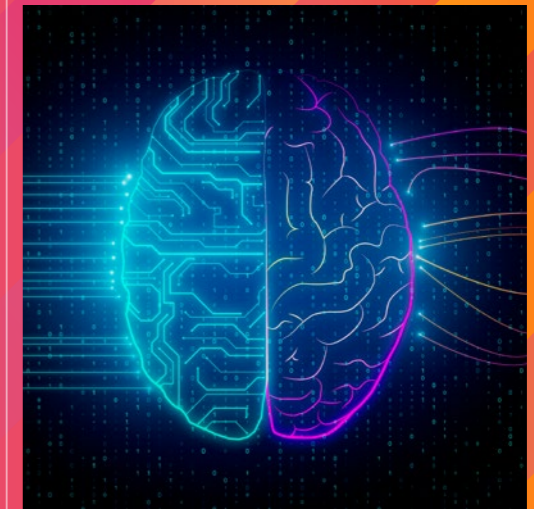
DIGITAL LITERACY IN THE UK

Given the multifaceted nature of digital literacy, measuring it among the workforce in a comprehensive way to identify gaps or shortages is difficult. Nevertheless, the existing data from studies that have attempted to do so suggest that the current state of digital literacy in the UK is mixed at best, and has raised concerns at governmental level about the impact on economic growth and development.[9]

A study that measured the problem-solving competencies associated with digital literacy is the Organisation for Economic Co-operation and Development's (OECD) Survey of Adult Skills, last carried out in 2012.[10] The study is considered to be one of the most of advanced international measurements of digital literacy, assessing the ability of adults to digitally access, process, evaluate and analyse information. As shown in Figure 1, the average scores for adults in England and Northern Ireland were lower than many other countries included in the study, including lower than the OECD average.

DIGITAL LITERACY SHORTAGES ACCORDING TO EMPLOYERS
More recent research with employers has tended to focus on narrower aspects of digital literacy, but nevertheless provides a sense of scale of the digital literacy gap in the UK. For instance, a government commissioned study by Ecorys UK (2016) reported that 72% of large companies and 49% of small and medium-sized enterprises SMEs in the UK are suffering tech skill gaps.[11] A 2019 report by the Confederation of British Industry (CBI) reported that two thirds of UK businesses have unfilled digital skills vacancies and that this problem might be expected to grow given that 95% of businesses expect their digital skills needs to grow in the next few years.[12]

The Department for Education's Employers Skills Survey 2019 – a survey of over 80,000 employers in England, Northern Ireland, and Wales – reported that there were over 214,000 vacancies that were proving hard to fill due to a lack of skills generally among applicants.[13] Of these skill-shortage vacancies, around a third (30%) were at least partially caused by applicants lacking digital skills required for the role. ❯

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The current state of digital literacy in the UK is mixed at best, and has raised concerns at governmental level.

PROBLEM SOLVING IN TECHNOLOGY-RICH ENVIRONMENT SCORES, BY COUNTRY*

Figure 1

Country	Score
Japan	294
Finland	289
Australia	289
Sweden	288
Norway	286
Netherlands	286
Austria	284
OECD Average	283
Denmark	283
Korea	283
Czech Republic	283
Germany	283
Canada	282
Slovak Republic	281
Belgium	281
England	281
Estonia	278
United States	277
Republic of Ireland	277
Northern Ireland	275
Poland	275

* Source: *OECD Survey of Adult Skills (2012)*

❮ As shown in Figure 2, the prevalence of these digital skills shortages varied by region. For instance, a lack of digital skills was notably high in Stoke-on-Trent and Staffordshire (a cause for 42% of all skill-shortage vacancies), Greater Birmingham and Solihull (38%), and London (35%). Whereas the prevalence was relatively low in Leicester and Leicestershire (14%), Sheffield City Region (19%) and Oxfordshire (22%).

Highlighting the widespread need for a digitally literate workforce, Table 1 shows that these digital skills shortages were also prevalent across all sectors of the economy (ranging from being a cause of 17% of all skill-shortage vacancies in the Hotels & Restaurants sector to 62% in the Information & Communications sector), as well as all occupations: including accounting for around a third of all skill-shortage vacancies for Managerial, Professional, and Associate Professional roles. According to the latest graduate outcomes data published by HESA – detailing what graduates from the 2017/18 academic year were doing 15 months after they left university – 76% of graduates in work were recruited to these 'high skilled' roles.[14]

HOW ARE EMPLOYERS ADDRESSING A SHORTAGE IN DIGITAL LITERACY?

The apparent shortage of digital literacy in the UK comes with significant economic impact. Analysis by Lloyds Bank suggests that digital literacy shortages among SMEs have created an £85bn productivity gap.[15] To address such shortages employers can either look internally and train their existing workforce or look externally and recruit new staff with the skills they need.

Regarding the former, in the latest Open University Business Barometer, 56% of UK employers reported a need to improve digital literacy in their organisations to keep up with technological change; a pace of change that has increased as a result of the COVID-19 pandemic. However, fewer employers – 32% – were anticipating increasing their level of investment in skills development for new staff.[16]

With regards to recruitment, the Open University Business Barometer reported that 49% of employers plan to recruit at a lower level and train up candidates over the next year to meet skills gaps. This is up from less than one in three (30%) last year. These findings chime with comments made at the 2019 Adobe Digital Literacy Forum by Sharan Singh (managing director of strategic partnerships at Minerva Project). Mr Singh explained that "what employers are looking for are problem solvers and problem finders" and that employers are "hiring for attitudes and will train for skills."

The digital literacy needs and experiences of digital transformation will vary between different sectors, and between different employers. In the next section we explore this with a selection of sector case studies. ◼
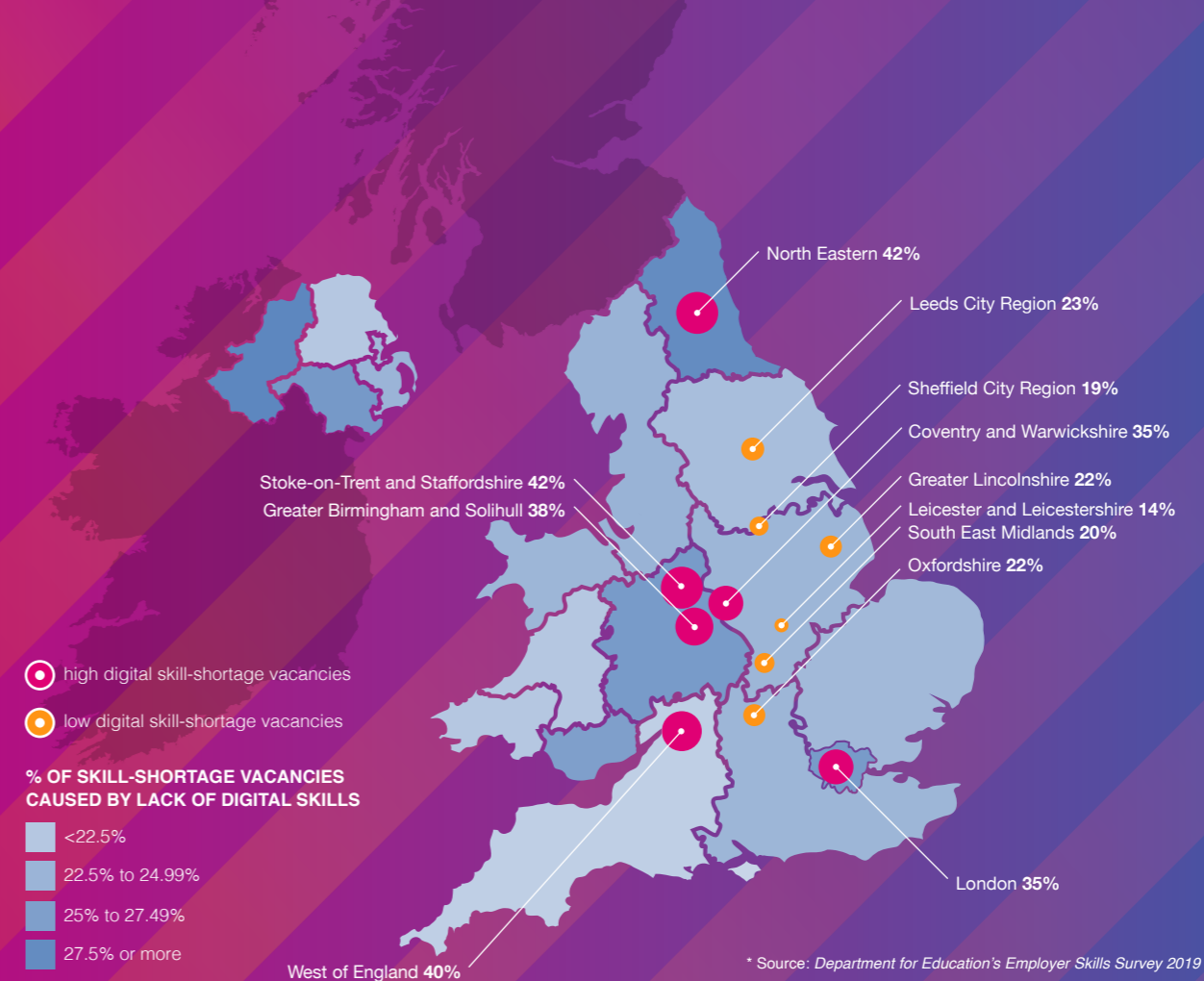
Table 1

DIGITAL SKILLS SHORTAGES BY SECTOR AND OCCUPATION*

	DIGITAL SKILLS SHORTAGES (AS % OF ALL SKILL-SHORTAGE VACANCIES)
OVERALL AVERAGE	**30%**
BY SECTOR	
Information & Comms	62%
Public admin.	37%
Primary Sector & Utilities	34%
Business Services	32%
Financial Services	32%
Health & Social Work	30%
Wholesale & Retail	29%
Transport & Storage	29%
Construction	26%
Education	25%
Manufacturing	25%
Hotels & Restaurants	17%
BY OCCUPATION	
Administrative/clerical staff	44%
Associate professionals	36%
Managers	34%
Sales and customer services staff	32%
Caring, leisure and other services staff	31%
Professionals	30%
Elementary staff	26%
Skilled trades occupations	23%
Machine operatives	19%

Source: Department for Education's Employer Skills Survey 2019

LOCAL ENTERPRISE PARTNERSHIPS (LEP) WITH DIGITAL SKILL-SHORTAGE VACANCIES*

Figure 2

North Eastern **42%**

Leeds City Region **23%**

Sheffield City Region **19%**

Coventry and Warwickshire **35%**

Greater Lincolnshire **22%**

Leicester and Leicestershire **14%**
South East Midlands **20%**

Oxfordshire **22%**

Stoke-on-Trent and Staffordshire **42%**

Greater Birmingham and Solihull **38%**

London **35%**

West of England **40%**

⊙ high digital skill-shortage vacancies

⊙ low digital skill-shortage vacancies

% OF SKILL-SHORTAGE VACANCIES CAUSED BY LACK OF DIGITAL SKILLS

- <22.5%
- 22.5% to 24.99%
- 25% to 27.49%
- 27.5% or more

Source: Department for Education's Employer Skills Survey 2019

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The apparent shortage of digital literacy in the UK comes with significant economic impact.

SECTOR CASE STUDY:
HEALTHCARE

THE PANDEMIC HAS ACCELERATED USE OF TECHNOLOGY IN THE SECTOR, EXPOSING THE NEED FOR GREATER LEVELS OF DIGITAL LITERACY

The Human Health and Social Work sector accounts for around 14% of all employment in the UK and is a sector which attracts many graduates. According to HESA's graduate outcomes data, 19% of all UK graduates from the 2017/18 cohort in work were employed in the sector 15 months after graduating. This includes 85% of graduates in Medicine and Dentistry, 78% of graduates in Nursing and subjects allied to medicine, 26% of Biological Science graduates, and 16% of graduates in Social Studies.

To explore the digital literacy needs of the sector we spoke with Henrietta Mbeah-Bankas, Head of Blended Learning and Digital Literacy Workstream Lead at Health Education England.

HOW DIGITAL TRANSFORMATION HAS CHANGED THE SECTOR
Whilst the healthcare sector has been shaped by new technological innovations – such as digital diagnostics, wearable tech and artificial intelligence to name a few – in 2019 it was estimated that the sector is at least 10 years behind other customer-facing industries in using

digital to transform the ways its services are provided.[17] A contributing factor behind this is a lack of digital literacy. Mbeah-Bankas explained that COVID-19 has accelerated the adoption of digital technologies but has also exposed the gaps in digital literacy: "Much of the healthcare sector would not have been able to deliver services over the past year without making the most of technology. Whilst that embrace of technology has been fantastic it has also highlighted that some gaps in digital literacy exist."

WHAT DIGITAL LITERACY MEANS IN PRACTICE
Following a programme of work on the topic, Health Education England defined digital literacy as being: The capabilities which fit someone for living, learning, working, participating, and thriving in a digital society. "It's an all-encompassing definition because we were very keen to not just equate digital literacy as technical skills or IT skills" said Mbeah-Bankas. "It takes away the idea that digital literacies are only pertinent for education or for working and instead establishes that these are skills that people need to participate in this digital world that we live in."

Mbeah-Bankas went on to explain that the pace of change is too fast for the focus to be on particular technical skills, rather the strategic focus is on building digital literacy: "New technologies will constantly emerge and that is why the focus is on digital literacy and digital readiness which is as much about attitudes as it is about skills. If a new piece of technology is introduced you can read a manual or have

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specific training on how to operate it, but what we need our healthcare workforce to have is a wider understanding of things like data security, understanding the inputs and outputs and how technology can help us process [tasks] faster, rather than being taught about specific pieces of technology."

DEVELOPING DIGITAL LITERACY AMONG GRADUATES
Universities have a role to play in helping to ensure graduates entering the healthcare sector have at least a baseline level of digital literacy. "Every university will approach digital literacy differently and that variety is healthy, but it should

be the case that regardless of where someone studies, they come out of their studies with at least a certain level of digital literacy." Health Education England has developed and is testing a digital literacy self-assessment diagnostic tool for the current and future healthcare workforce and Mbeah-Bankas sees opportunities for universities to utilise such tools to inform the development of digital literacy at every stage of a student's learning. "What we are saying is in terms of your student journey, and in all the activities that you will carry out, how does digital allow you to do that better, or to make the most of the activity. Digital therefore becomes a driver for achieving the best outcomes in everything you're doing."

CASE STUDY:
CONSTRUCTION

A DIGITALLY LITERATE CONSTRUCTION WORKFORCE IS NEEDED TO HELP TACKLE THE SECTOR'S PRODUCTIVITY PUZZLE

The construction sector is one of the largest industries in the UK, contributing around 8% of economic output, and will play an important role in the country's economic recovery and delivery of the government's priorities such as big-ticket infrastructure projects, affordable housing, and decarbonisation. Around 2% of all UK graduates from the 2017/18 cohort in work were employed in the sector 15 months after graduating. This includes 23% of graduates in Architecture, building and planning, and 9% of Engineering graduates.

To explore the digital literacy needs of the sector we spoke with Marcus Bennett, Head of Analysis and Forecasting, and Martin Turner, Industry Insight Manager at the Construction Industry Training Board (CITB). We also spoke with Nicola Pearson, Head of Skills and Knowledge Exchange at the Centre for Digital Built Britain (CDBB) – a key partner in the Construction Innovation Hub which brings together expertise from the Building Research Establishment (BRE), the Manufacturing Technology Centre (MTC) and CDBB to transform the UK construction industry.
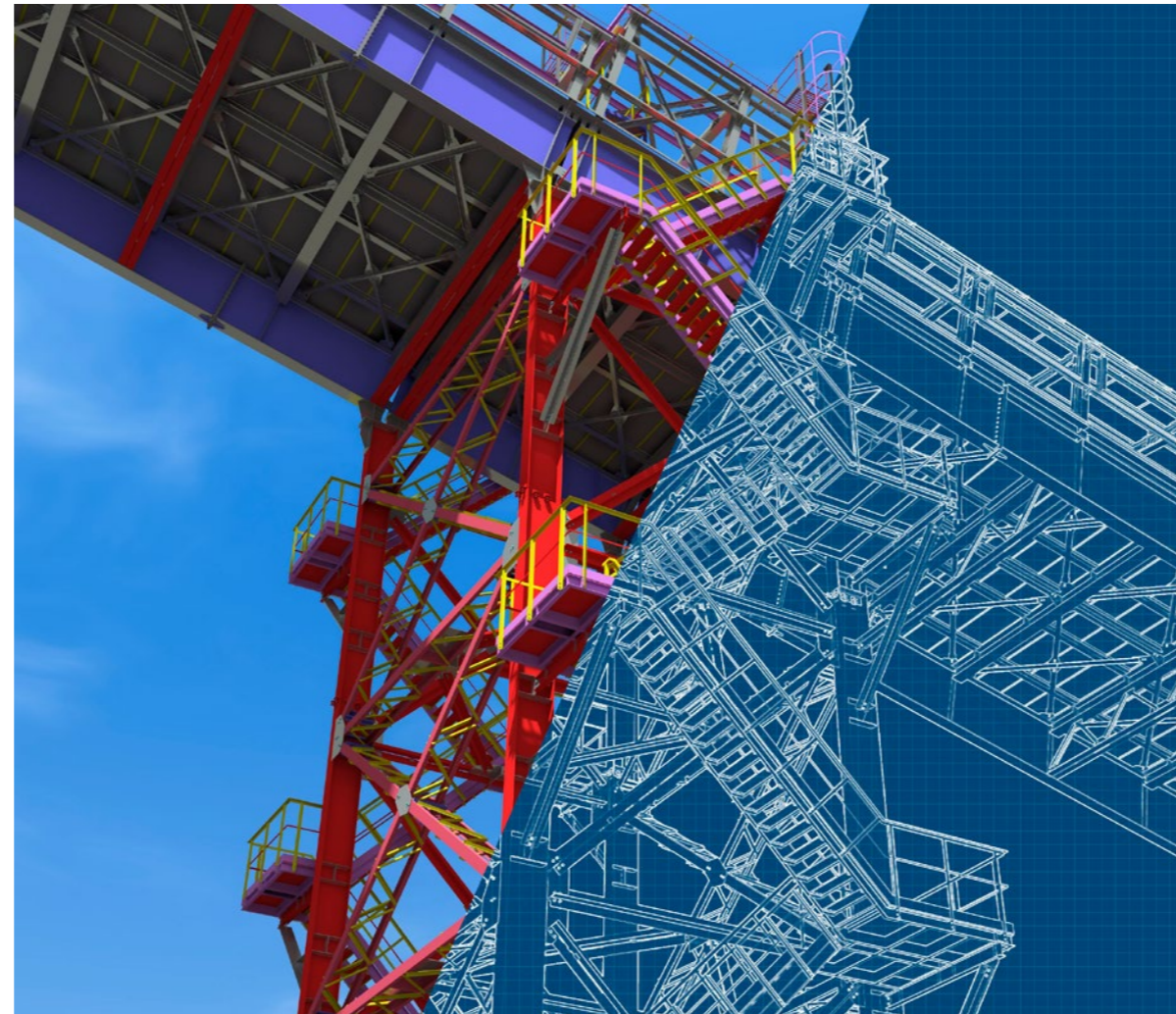
HOW DIGITAL TRANSFORMATION HAS CHANGED THE SECTOR

Whilst construction has a large economic footprint in the UK, it is one of the country's least productive sectors.[18] Digital transformation has a critical role to play in helping to boost the sector's productivity, whilst also reducing carbon emissions. One of the major digital innovations in the sector has been the increased use of information management using Building Information Modelling (BIM) – something which has been championed by the UK government over the past decade – but digitalisation of construction is wider than just BIM. It includes the use of digital technologies – such as drones, imaging and scanning technologies, and augmented reality – but, more importantly, the digital transformation of the entire life cycle of the UK's built assets through better data collection and analytics. Turner explained that whilst there is still some way to go in the sector's utilisation of digital technologies and data, there have been encouraging signs of its transforming effect: "For years it felt like the digital transformation of construction was always just around the corner, but it feels different now. The UK construction sector is now seen as one of the more technologically advanced in the world."

DIGITAL LITERACY IN THE SECTOR

Research by CITB has previously identified general shortages of digital literacy in the sector, including the ability of leaders and managers to embrace and implement digital change.[19]

Bennett said "rather than having skills for specific pieces of technology [CITB's] research has found that it's the attitudinal and behavioural competencies, things like problem solving, that are most important and currently lacking."
This is a view shared by Pearson, who explained that "the industry is very data rich but information poor with a lack of flow through from data to information. There is a need for people to understand how to use data, how to clean it, how to understand whether they can trust the data and whether they know how to define the benefits of digital technologies, not just understand their functionality."

DEVELOPING DIGITAL LITERACY AMONG GRADUATES

Graduates entering the sector will play a key role in helping to realise the benefits of digitalisation of the industry. Bennett said "construction needs people with a greater diversity of skills and higher-level skills, which also applies to their digital literacy. Construction cannot get enough people coming out of university with maths and science degrees to be part of the digital transformation of the sector."

CDBB has been working with professional institutions from across the sector, as well as industry representatives and course leaders of undergraduate and postgraduate qualifications to achieve consensus on the digital capabilities required across a range of professional disciplines. This framework will be published in summer 2021.

CDBB has also been undertaking research to identify the skills and competencies of roles in the sector that will be needed to realise the vision of a digital built Britain, including innovations such as the National Digital Twin.[20] Whilst the Centre's work is not specifically focused on digital literacy, it is acknowledged that digital literacy is a key enabler for transformation. Pearson said "there are far too many people that think digital capabilities are something that you acquire after initial study and training rather than something that fundamentally changes the nature of those professional skills. When you start to think of it like that you don't then focus on the software, you focus on the whole way of working."

SECTOR CASE STUDY:
MEDIA

A SECTOR WHICH HAS BEEN RAPIDLY CHANGED BY DIGITAL NEWS CONSUMPTION HAS DEMANDED A DIGITALLY LITERATE AND ADAPTABLE WORKFORCE

According to the latest graduate outcomes data from HESA, 7% of all UK graduates from the 2017/18 cohort who were in work in work 15 months after graduating were employed in the Information and Communication sector. This includes 29% of Mass Communications and Documentation graduates.

To explore the impact of recent transformations of the sector and what digital literacy means in practice, we spoke with Mike Deri Smith, Head of Digital at Channel 4 News.

HOW DIGITAL TRANSFORMATION HAS CHANGED THE SECTOR
A significant driver of digital transformation in the news media industry has been the proliferation of social media platforms. Smith explained that "to reach new audiences we've had a massive shift in what we do day-to-day which is to now make original content specifically for the different social media platforms. This has revolutionised our ability to reach 16- to 34-year-olds." More than just expand reach, however, these changes have

> **" A grounding in journalism was once the only requirement, but digital literacy is now an absolute requirement.**

led to the development of multiskilled producers and has increased productivity: "A producer is now very multiskilled. They're not just performing one function, they're now scripting, producing, uploading, doing all of the social media, which has enabled us to produce content at greater scale, at a lower cost, but without any detriment to quality."

WHAT DIGITAL LITERACY MEANS IN PRACTICE
For his team at Channel 4 News, Smith explained that digital literacy is not limited to experience

in using any particular piece of software or technology – indeed he mentioned that the software used by the team has in the past changed at very short notice – it is more about having a strategic sense of what is possible. "Our digital literacy requirements involve having a strategic sense of what type of content works on different social platforms – because it's so different on every platform – as well as having the digital production and editing skills to create the content."

According to Smith the digital literacies of his team played a significant role in them winning the 'Outstanding Digital Team of the Year' award at The Drum Online Media Awards. "The main reason we were recognised as the best team in the country at producing news video is because we are able to adapt quickly and make better content by experimenting with different tools." Smith offered the example of a series of animated explainer videos about Brexit that "ended up being the most watched content about Brexit" and were only possible because "we had people who are super multi-skilled who understand YouTube as a platform, understand the audience, and understand the capabilities of [digital technologies] available to them that we were able to make really compelling content very quickly in response to a very fast moving story."

DIGITAL LITERACY OF GRADUATES
Reflecting the idea that digital literacy is a 'gate skill' Smith noted that when recruiting graduates in the industry "it does not matter if they are going to be an investigative journalist or a reporter, getting into a newsroom requires digital literacy. A grounding in journalism was once the only requirement, but digital literacy is now also an absolute requirement."

PRIORITISING DIGITAL LITERACY IN HIGHER EDUCATION

Prior to the COVID-19 pandemic the need for the UK workforce to have sufficient levels of digital literacy to reap the benefits of digitalisation and embrace the Fourth Industrial Revolution was already compelling. It is likely that as the country emerges from the pandemic, that need will have only increased.

The sudden changes imposed on the healthcare sector have exposed shortages in digital literacy. Digital literacy will play a crucial role in solving the productivity puzzle in construction and deliver on some exciting innovations. Digital literacy is also crucial in the information and communications sector which has experienced rapid change in how individuals access and consume news content.

As institutions of higher learning, universities clearly have an important role to play in enhancing students' digital literacy to endow them with readily transferable skills, attitudes, and ethics that prepare them for a workplace that is fast being transformed by technology. It is important, however, that it is digital literacy in its truest sense that is nurtured in students.

Too often the focus can be on teaching the technical operations when using digital tools, whereas a more immersive, all-encompassing approach to digital literacy should help develop students' abilities to cognitively apply their skills to evaluate, critique, synthesise and produce new information, to be inquisitive in finding problems and using digital tools to solve them, to produce innovative projects, and to communicate in innovative and visually compelling ways. ∎

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