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WorldSkills UK Construction
Roundtable Report:

***“The future of construction
is manufacturing”*** June 2018



Introduction

This roundtable event was conceived out of a need to develop a future-facing perspective on where the construction industry is moving to in terms of technology, and the implications this has for skills training and development. WorldSkills UK, a partnership between governments, industry and the FE and skills sector, convened this discussion for stakeholders to consider how we prepare for the future.

Context

A changing economic landscape and the introduction of new technologies will transform the skills needs of the workforce. The number of young people working in traditional trades such as bricklaying is likely to reduce. Instead of this being viewed as a risk, it presents the opportunity to explore how we train young people for the millions of future roles by 2024¹.

For example, research suggests that growing demand for offsite – or prefabricated – construction for housing and infrastructure could be hampered by a lack of appropriate training. Of businesses expecting to use offsite construction over the next three to five years, 38% said they believed they will need new or significantly improved skills within their workforces. Handling and assembly skills are those most in demand, with 81% of employers citing them².

Before the roundtable participants considered four key questions:

- **Catalyst for change:** Do we look at Brexit as an opportunity to move to a completely different construction operating model - to an offsite model (factory-based) - which will require the development of new or blended skill sets?
- **Drivers:** What would be the potential drivers of a new operating model for housebuilding and infrastructure eg public policy, regulation, cost effectiveness?
- **Constraints:** What would hold back the development of a new operating environment and preparation for new skills training and development eg industry intransigence, lack of client demand, lack of preparedness by the FE and skills sector, lack of skills in the workforce?
- **Perception:** What might enthruse young people to consider careers in construction and how do we prepare the ground for a new tech and construction skills conversation?

¹ <https://www.macegroup.com/perspectives/171027-moving-to-industry-40>

² https://www.citb.co.uk/documents/research/offsite_construction/offsite_construction_report_executive_summary_20170412.pdf

How tech is transforming construction

Paul Gallagher from Mace presented on the report 'Moving to Industry 4.0'³, considering how technology is changing the construction industry and the implication this will have for the skills that the industry will need in the future.

Paul discussed wider sector challenges which included an ageing workforce, the negative perception of the industry amongst the public, lack of diversity and challenges around productivity. This was all in the context of the importance of the sector - accounting for 8-9% of the economy and a key sector which facilitates the development and maintenance of the housing, infrastructure and property we rely on for work and life.

The table below presents the results of an analysis that applies different rates of technological advancement to the occupations within construction that are most susceptible to automation.

Occupation	Employment 2021	Employment 2040		
		Slow-paced technological change	Medium-paced technological change	Fast-paced technological change
Specialist building operatives	55,480	14,400	8,840	3,281
Roofers	43,830	11,376	6,984	2,592
Labourers	127,220	33,020	20,272	7,524
Wood trades and interior fit out	262,920	68,241	41,895	15,549
Plant operatives	42,040	10,911	6,699	2,486
Plasterers	47,500	12,329	7,569	2,809
Floorers	25,580	6,639	4,076	1,513
Steel erectors/structural fabrication	25,450	6,606	4,055	1,505
Bricklayers	72,760	18,885	11,594	4,303
Painters and decorators	111,080	28,831	17,700	6,569
Total employment	813,860	211,237	129,685	48,132

Mace: Moving to Industry 4.0.

Overall, Paul's presentation demonstrated a positive take on the future of a construction industry that will gain, not lose jobs. Comparatively there is a need to develop an understanding on how, through automation and robotics, the industry can become more productive. Buildings are no longer developed and constructed in the ways that they previously were, and increasingly there are more projects using modularisation and offsite production and assembly.

This was all summarised by Paul as:

"The future of construction isn't construction, it is manufacturing."

These sentiments were echoed by CITB's Ben Lever who shared insights from the organisation's report 'Faster, Smarter, More Efficient: Building Skills for Offsite Construction'⁴, which builds on the work of the report by Mace. Construction projects are already involving design and manufacturing components at the outset and in the future digital construction will be an important skill across the built environment supply chain.

Key messages from CITB report

1. ***Offsite construction will grow as firms invest in factories and other offsite technology, 42% of firms with over 100 staff expect to use offsite construction in 3-5 years' time.***
2. ***One of the biggest drags on the rise of offsite construction would be an inadequately trained workforce. Digital skills and knowledge of offsite materials and processes is crucial for this function.***
3. ***There is a clear appetite for innovation in the housing and commercial sectors being able to make the business case for offsite construction. This is vital but "no-one is training estimators in offsite methods".***
4. ***Planning and coordination between offsite and onsite construction requires new skills and knowledge. Managers need specific knowledge of offsite capabilities, especially if they manage all stages of production.***
5. ***In addition to any technical skills, trades and multi-skilled operatives in factories need training in the right behaviours that are transferable across the industry.***

Opportunities and challenges ahead

There was a general consensus that technology is changing the shape of the sector but how we prepare for the future is an entirely different conundrum. The construction industry is working in a fragmented way, where there is a need for leadership as identified in the Farmer review⁵ and this will need to be a collaborative effort, but it is unclear what the starting point is and who will be taking the lead.

Dudley College has taken a leap of faith by investing in its Dudley Advance II, Centre for Advanced Building Technologies⁶.

The college is working in partnership with leading employers across the region, who are embracing new technologies – ensuring that their training gives young people the skills that they are looking for from their future workforce. The Greater London Authority (GLA) is currently trying to stimulate this in London through the development of the Mayor's Construction Academy, where there is the capital investment available for this type of innovation and encouragement of others to get involved.

The role of the SMEs was highlighted as a key player in the development of this, where despite the limited resources, they play a crucial role in managing the supply chain - training and upskilling talent. Given there are so many players involved in the process, the discussion began to build around the role public procurement can play in encouraging collaboration. Through public procurement the London Legacy Development Corporation (LLDC) is encouraging bidders to address how they work collaboratively. Failure to do so can result in a unilateral conversation, in which Tier 3 & 4 companies that develop the supply chain don't have much of a say in the conversation and decision making process. This is particularly so when we consider the role the traditional trades still have and how we go about upgrading skills and training within these existing occupations. So, contrary to the ideas we were testing around technology, the traditional trades remain a vital component in the future of this conversation that shouldn't be forgotten.

Turning to the perceptions of the construction industry, there was a feeling that there is not an understanding of the breadth of roles available.

This links into the widely discussed topics around diversity and changing minds or perceptions about the industry amongst communities. LLDC noted their work with Design Engineer Construct (DEC) which gets young people to discover professions in architecture, engineering and built environment, through a project-based approach and applies pure academic subjects to the latest construction industry practices.

Similar to this, Kier developed a new campaign called 'Shaping Your World', which is aimed at Generation Z (11-15 year olds), careers advisers and parents. It is designed to bring together the many diverse skills, professions and disciplines within the built environment sector under one collective vision - to get young people thinking and talking about the impact buildings and infrastructure have on our day to day lives.

Kier anticipates that the future skillsets of its directly employed workforce will need to include digital design and education. Digital skills will also be required among their delivery teams who will need to be able to manage the construction digitally to successfully combine all the separate pieces in line with the expected project timeline.

Kier has launched a new Digital Construction Apprenticeship this year which focuses on developing the much-needed digital skills (noted above).

The quality of candidates that applied have been exceptional, with high levels of interest in this new apprenticeship standard, due to this being the first to be delivered in the industry.

Conclusions

From the discussion were able to draw the following conclusions:

- 1. We need to maintain a twin-track approach to skills:** With the technological changes happening within the sector we must not forget the role and importance of attracting young people to the traditional trades, which is such a crucial part of the supply chain in construction now and in the future. However, a key component of these traditional trades is how we continue to upskill those who undertake them and how we merge new technologies into these trades.
- 2. We need to take an "innovation leap of faith":** There has been a big question around who takes on the leadership of investing in technology and the future-proofing of the sector from a skills perspective. Given the twin-track approach to skills development, we need to ensure there is a 'research and development' conversation taking place between industry and the education sector. The perception historically being that it should be demand led by employers but employers want to build on the demonstrated best practice observed in some colleges. There needs to be further strengthening of the collaboration between employers and FE institutions. We need a collaborative effort to create a lot more dialogue between the industry and further education and the opportunity for FE to lead that debate where there is capacity, to create greater employer engagement and a more structured dialogue. To future-proof the industry there also needs to be effective collaboration between employers and the skills sector to ensure we have the right standards, qualifications and funding in place.
- 3. We need to take a longer term perspective:** While we work out the implications of public policy reforms within the sector, such as the impact of the Apprenticeship Levy, this can stop us from developing a longer-term vision. There is a leadership role for the FE sector to play in laying out this vision for the value of technical education aligned with economic and technological development in the context of attracting inward investment and helping maintain competitiveness.

4. **We need to attract more young people to the sector by “translating the industry” better:** We need a new way of describing construction careers that incorporates the technological changes and modernisation so it appeals to young people. Where there is an emphasis on the transferable careers and skills that young people can bring into the sector - whether that is scientific, numerical or artistic, we need a more creative approach. This must emphasise the outcomes of construction and use more exciting imagery than hard hats and high vis vests.
5. **We need to engage schools:** But with an understanding that schools are under constraints to meet their targets – which construction companies recognise. So we have to engage with schools in a far more systematic and embedded way. Construction companies are built around projects that are delivered in locations covering multiple schools. A more focused approach can be taken where engaging with schools should be seen as an investment for the longer-term.

Next Steps

- WorldSkills UK and partners will publicise and share the report with networks and key stakeholders.
- We will take the findings to our Youth Summit to test with young people.
- We will bring the learnings to WorldSkills UK LIVE, November 2018, and showcase throughout the different features of the event.
- We will host a follow up event with partners at WorldSkills UK LIVE, which will look at how we can push forward the conclusions of the report as a group.

About WorldSkills UK

What we do: We are an accelerator for young people in the start-up phase of their careers. This means we inspire more young people to take up apprenticeships and technical education; we champion their success; and we accelerate their personal and professional development.

Why we do it: To change the national conversation so that apprenticeships and technical education are seen as prestigious career routes for all young people.

How we do it: Through experiential and digital careers advice; skills competitions, and mindset and productivity training.

Thanks go to the following partners for their contributions:

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Department
for Education