

# Exploring employability of engineering graduates in SMEs

Chris G Lambert

*Department of Educational Research and  
Department of Engineering, Lancaster  
University, UK.*

Paul Ashwin

*Department of Educational Research,  
Lancaster University, UK.*

## Abstract

*The employability of graduates has become more significant for universities over the past two decades with changes in higher education policy causing marketisation effects. This has caused a push factor from students, who are increasingly paying attention to destinations data of programmes and pull factors from employers who demand “work ready” graduates. This places significant pressure on universities to achieve sufficient integration of employability preparedness into and alongside curricula. Small to medium-sized enterprises (SMEs) can be seen as a “poor relation” to the hype and considerable marketing resources that large employers use to promote attractive graduate schemes. However, innovative SMEs have much to offer graduates in terms of workplace development and levels of employee satisfaction. The aim of this research is via semi-structured interviews with engineering graduates and managers to identify those needs which are most sought after by SMEs. This pilot study interviewed five participants from three SMEs and found a need for the following features in engineering graduates: strong foundations; effective communication, including listening skills; empathy and emotional intelligence; the value of experience; good project management skills; and manufacturing competence. The results identify areas for university staff wishing to prepare their students as well as students themselves wishing to progress into work in SMEs.*

## 1. Introduction

Graduate employability is complex and subjective but in its simplest form it is about enhancing the ability of individuals to obtain work that without the learning at university, would have been unobtainable. Forrier and Sels [1] in putting forward a conceptual model offer up a definition of employability as “an individual’s change of a job in the internal and/or external labour market” reflecting their interest in both the abilities of the individual and the opportunities available in the external market. Dacre Pool and Sewell [2] in their model of career management define employability as:

“Employability is having a set of skills, knowledge, understanding and personal attributes that make a person more likely to choose and secure occupations in which they can be satisfied and successful.”

[2 p. 280]

This definition importantly includes the notion of satisfaction and success, which of course are features of importance for both the individual and the employer. Attaining a graduate level position in which one is neither satisfied nor successful is likely to have detrimental consequences for both sides and may even inhibit the motivation of either side to recruit to or apply for similar vacancies. It is well-documented that UK engineering is facing a shortfall of graduates [3] and “recruiting engineering and technical staff with the right skills is the largest anticipated obstacle that businesses face in achieving objectives over the next three years. This is a serious and ongoing issue that has featured strongly in previous surveys” [4 p. 3]. The correlation of STEM talent to economic outputs measures such as gross domestic product (GDP) and their role in sectors such as manufacturing, positions graduates in a delicate position of being both in demand but requiring the necessary skills, knowledge and behaviour to transition into employment.

A decades-old blame-game exists as to whose responsibility it is to develop the transferable skills required by an individual to successfully contribute to the labour market [5] and whether this is the remit of universities, employers or a combination thereof. Large employers have established, well-known graduate schemes which typically offer a well-structured means of experiencing a variety of business units over a defined period of time. Furthermore, the schemes benefit from well-resourced, dedicated careers teams, many of whom compete for graduate talent from target universities. Such affordances and benefits are not the same for SMEs and so even to compete with such well-oiled, glamorous locomotives is challenging. In the UK, market failures have been identified affecting graduate recruitment into SMEs on both supply and demand sides [6], supporting the need to better

understand this area through generation of deeper knowledge.

Often described as a lifeblood of the economy, SMEs play a vital role in contributing to employment, economic output and innovation. It is a well-reported fact that in the UK, SMEs make up >99% of all businesses [7] and total employment comprising 60% (16.6M) of total workforce with an estimated turnover comprising 52% of the total at £2.2TN [7]. Although commonly described as a category in their own right SMEs are far from an homogenous entity and assumptions to this end can be a major drawback when investigating these businesses, such as in organisational and managerial processes [8]. Therefore, research methods which aim to go beyond relatively superficial data collection with large datasets or analyses of existing literature are well-suited to exploring the employability of engineering graduates in SMEs.

## 2. Method

In moving towards a research agenda for employing graduates in SMEs [9] suggested careful consideration should be given to methodology, proposing that the “research agenda will need to grapple with difficult methodological questions” [9 p. 271], suggesting studies of a broadly ethnographic nature are required. The authors believe that “the real gain in understanding will come from detailed, situational, qualitative work” [9 p. 283]. Qualitative interviews “provide opportunities for mutual discovery, understanding, reflection and explanation via a path that is organic, adaptive and oftentimes emerging. Interviews elucidate subjectively lived experiences and viewpoints from the respondents’ perspectives” [10 p. 132]. In response to this literature, a semi-structured interview schedule was devised which covered business activities, graduate talent recruitment, engineering graduate capabilities/contribution and an opportunity for participants to add further comment.

Purposeful sampling was employed by using the author’s professional network of SMEs to identify participant organisations that meet the following criteria:

- i) Is an SME;
- ii) Is located in England;
- iii) Employs or has employed engineering graduates;

Semi-structured interviews were undertaken with five individuals from three different English SMEs, which comprised two managers, two graduates and one manager/graduate over the summer of 2021. SMEs were located in Cambridgeshire, Yorkshire and Oxfordshire, representing a range of standard

industrial classifications. Ethics approval was sought and granted in line with institutional policy and procedures. Interviews were conducted and recorded on MS Teams with the researcher gaining informed consent prior to each interview. Most interviews lasted just under an hour. Field notes were taken post-interview which included four areas of overall impression, salient points, surprises and comments on protocol. Interviews were imported and transcribed in NVivo 12. Key points from participants and annotations were then imported into a spreadsheet to allow grouping and identification of themes. Given the small sample size, no coding was done at this stage. The aim was to identify themes in which multiple participants made reference to the same or similar issues.

## 3. Results

The results provide six areas in which there was commonality identified within the sample and hence agreement with at least two of those interviewed on the significance of these features of engineering graduate talent. An overview of these themes is provided below.

### 3.1 Strong foundations

The importance of having strong engineering foundations and principles is important for engineering graduates to be able to fulfil their roles in SMEs. This was reported across both managers and graduates. Technical competence has to underpin additional attributes and capabilities. Being relatively broad and not specialised is seen as advantageous.

### 3.2 Communication and listening

Communication, both orally and written was cited multiple times by participants. Within communication, there was also an emphasis on listening; this aspect of listening is part of communication strategies to successfully elicit information from for example customers or potential customers. Participants actively promoted the concept of communication as being two-way, in some instances making reference to negotiation.

### 3.3 Empathy and emotional intelligence

Emotional intelligence (EI) has been discussed by participants in this pilot as being an important feature of employment success amongst engineering graduates. Empathy can be used as a means to understanding other people’s viewpoints in the pursuit of new product development (NPD) and also in building relationships.

### **3.4 Experience, experience, experience**

The notion of graduates having undergone professional work-based experience prior to graduation was a recurring theme from both managers and graduates who were interviewed, with some strong sentiments on the significance of this. There was particular support for the sandwich, year-in-industry or placement year model with first-hand recounting that this had a significant and positive effect on an engineering graduate being useful to the business.

### **3.5 Project management**

The term project management was not used extensively throughout all interviews by participants but what they described can be best summarised by the term. There was consistent mention of planning, resourcing, recording and risk management, all constituent parts of project management.

### **3.6 Manufacturing competence**

This was a theme identified which relates to the process of getting things made and it was felt that some engineering graduates lacked this competence and that one graduate also stated that one of the skills identified which had been developed most at the SME was around manufacturing and figured out how things will get made.

## **4. Discussion and conclusion**

This small pilot-scale project demonstrates there is much intelligence to be gathered from SMEs which employ engineering graduates from qualitative methods. It has identified several areas which both managers and graduates themselves consider important to be effective in those organisations. The areas listed above combine areas of technical competence with skills of a more transferable nature and represent what is likely to be content already delivered in many engineering programmes. Acknowledgement of the importance of experience further underlines the value of experiential learning within degrees, such as placement years and internships. Students wishing to be effective in SMEs upon graduation should use their time at university to seek relevant experience upon which they should reflect. The six areas identified above are not discreet pigeonholes but interconnected where for example experience gained during an internship will likely have impacts on areas such as communication, project management and others as relevant.

There is a need for SMEs to ensure that the graduate talent pipeline is the most effective it can be, within the constraints of what university programmes are able to deliver. The graduates who are best prepared to make positive impacts in organisations in the early part of their career will be of most value to those employers and will themselves be rewarded with satisfaction. This helps to ensure longevity of roles in the sector. Innovation activity correlates with both firm survival and firm growth. Equipping graduates with the experience, knowledge and skills to support innovation in SMEs should be a feature of university education. However, the competition from large enterprises in terms of recruiting talent with established graduate training programmes oftentimes dwarfs individual SMEs that have graduate recruitment needs. Making the SME route to meaningful employment clearer for students should be a feature of university programmes, including through experiential learning. University teachers also have a responsibility to include examples in teaching that include SMEs.

This work has attempted to highlight the importance of SMEs as a destination for graduates from university engineering programmes. Not all individuals will be suited to these roles and environments which are likely to differ considerably from those in large enterprises. Differences are likely to exist for example in areas such as autonomy, responsibility, breadth and depth of work and progression. Those individuals who are well-suited to such environments need to have the visibility of SMEs as a viable route to meaningful graduate work in which they can be successful and satisfied. SMEs and universities have a dual responsibility in which to understand each other through joint-working so that the transition from one to the other can be as smooth, impactful and as efficient as possible.

## **5. References**

- [1] Forrier, A. and L. Sels, "The concept employability: A complex mosaic". *International Journal of Human Resources Development and Management*, 2003. 3: p. 102-124.
- [2] Dacre Pool, L. and P. Sewell, "The key to employability: developing a practical model of graduate employability." *Education + Training*, 2007. 49(4): p. 277-289.
- [3] Engineering UK, "Engineering UK report 2018". 2018.
- [4] The Institution of Engineering and Technology, "IET Skills and Demand in Industry 2019 Survey" 2019.

[5] Succi, C. and M. Canovi, "Soft skills to enhance graduate employability: comparing students and employers' perceptions". *Studies in Higher Education*, 2019: p. 1-14.

[6] Sear, L, Scurry T, Swail J, and Down S. "Graduate Receruitment to SMEs". 2012.

[7] Department of Business, Enterprise and Industrial Strategy, "Business population estimates for the UK and the regions 2019". 2020.

[8] O'Regan, N. and A. Ghobadian, "Testing the homogeneity of SMEs." *European Business Review*, 2004.

[9] Holden, R. and S. Jameson, "Employing graduates in SMEs: towards a research agenda". *Journal of Small Business and Enterprise Development*, 2002.

[10] Tracy, S. J., *Qualitative research methods: Collecting evidence, crafting analysis, communicating impact*. 2013: John Wiley & Sons.