



Skills Trends at Work in Britain:

First Findings from the Skills and Employment Survey 2017

Golo Henseke, Alan Felstead, Duncan Gallie, Francis Green

HEADLINES

Skilled jobs benefit workers and the economy alike. This report examines the evolution of job skills, the changing importance of post-graduate qualifications and gender gaps in job skills over the last 20 years in Britain. Skills trends are contrasted with faltering technical and organisational change.

- Our findings suggest that the growth of skills demand has slowed and even reversed in some domains since 2012. Literacy and numeracy skills have declined in importance, graduate-level jobs have not expanded significantly, and required workplace learning and training have continued on a downward path.
- Against this overall pessimistic backdrop, gender gaps in job skills have narrowed, and in the case of graduate-level jobs, reversed. By 2017, a greater proportion of women worked in graduate-level jobs than men.
- The economy has faced a slowing intensity of technical and organisational change since 2012. In addition, technical change has become gradually less skill-biased over the period 2001-2017. In contrast, organisational change has become more skill-biased over the same time period.

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1. The Race Between Education and Technology

It is widely believed that recent technological change has been skill-biased. Modern information and communication technology (ICT) has enabled skilled workers to work more productively, thereby allowing the rising number of graduates to find good, well-paid jobs. At the same time, these trends have contributed to the decline of middle-skilled jobs. Their employment share has fallen as the work tasks involved in these jobs have increasingly been carried out by computers and/or computerised machines.

However, recent studies from the United States have cast doubt on whether this engine of high-skill growth will continue unabated. A weakening demand for cognitive tasks has pushed skilled workers into positions further down the job skills ladder. As a result, recent higher education graduates have increasingly struggled to secure employment in typical graduate jobs. Other scholars have pointed to the rising potential of a new generation of white-collar automation that will replace knowledge work tasks in a process of digital Taylorism.

2. Previous Evidence

Up until now, the evidence either way has not been clear cut. Data from the 2012 Skills and Employment Survey, for example, did not confirm a definite slowdown in the demand for skills. On the contrary, skilled jobs requiring higher education continued to rise, as did the use of a range of generic job skills. These trends began as far back as the 1980s. But analyses of the graduate labour market have revealed rising pay inequalities coinciding with widening pay gaps by degree class or level during this period. This indirect evidence hints at a potentially increasing mismatch between job skills demand and supply. By examining what has happened to job skills in Britain in 2017, this report contributes new, up-to-date evidence on the state of job skills demand.

3. The Skills and Employment Survey 2017: A New Source of Evidence

The Skills and Employment Survey 2017 (SES2017) provides us with a unique trend picture of job skills, knowledge requirements, and potential drivers of high-skill demand from the workers' perspective. It collected data from working adults aged 20-65 years old in England, Wales and Scotland who were interviewed in their own homes in 2017. The sample was drawn using random probability principles subject to stratification based on a number of socio-economic indicators. Only one eligible respondent per address was randomly selected for interview, and 50% of those selected completed the survey. Data collection was directed by ourselves and conducted by GfK.

SES2017 is the seventh in a series of nationally representative sample surveys of individuals in

employment aged 20-60 years old (although the 2006, 2012 and 2017 surveys additionally sampled those aged 61-65). The numbers of respondents were: 4,047 in the 1986 survey; 3,855 in 1992; 2,467 in 1997; 4,470 in 2001; 7,787 in 2006; 3,200 in 2012; and 3,306 in 2017. For each survey, weights were computed to take into account the differential probabilities of sample selection, the over-sampling of certain areas and some small response rate variations between groups (defined by sex, age and occupation). All of the analyses that follow use these weights. For more information on the series see Felstead, A, Gallie, D and Green, F (2015) (eds) *Unequal Britain at Work*, Oxford: Oxford University Press.

4. Indicators of Job Skills, Knowledge Requirements and Workplace Changes

With repeated, cross-sectional information from the SES series, it is possible to illuminate trends in generic job skills, qualification requirements and potential drivers of the rising demand for skills.

Survey respondents report the importance of 36 job tasks covering activities that draw on manual, cognitive as well as social skills. For each job task, five response options were offered ranging from 'essential' to 'not at all important'. From this, we identify jobs in which *literacy*, *numeracy*, *complex problem-solving*, *self-planning* and *social skills* are 'essential' or 'very important' to assess high level use of *generic skills*. Participants are also asked to assess the importance of *computer use* on the same response scale. These questions have been repeated in each survey since 1997. This enables us to depict long-term trends in the evolution of job skills over the last two decades.

Generic skills are an important but not the only facet of skills requirements of the job. To give a comprehensive picture, we also examine the changing proportion of workers who report that one would need a *graduate-level* qualification to get their job. This is contrasted with jobs that require *no qualifications* as assessed by workers.

Since an ever increasing share of the labour force has graduated from higher education, differentiation by, for example, field of study, degree class or the degree level may have become more important. Using SES, we break down graduate-level jobs into jobs requiring *post-graduate*, *graduate* or *professional* qualifications.

Many skills needed at work are gained not at school or university, but on-the-job. SES asks respondents to quantify how long it took them to learn to do their work well and whether they have undertaken job training for their line of work. For both *learning* and *training requirements* there are seven response options, ranging from 'less than 1 week' to '2 years or more'. We converted the response scale to months.

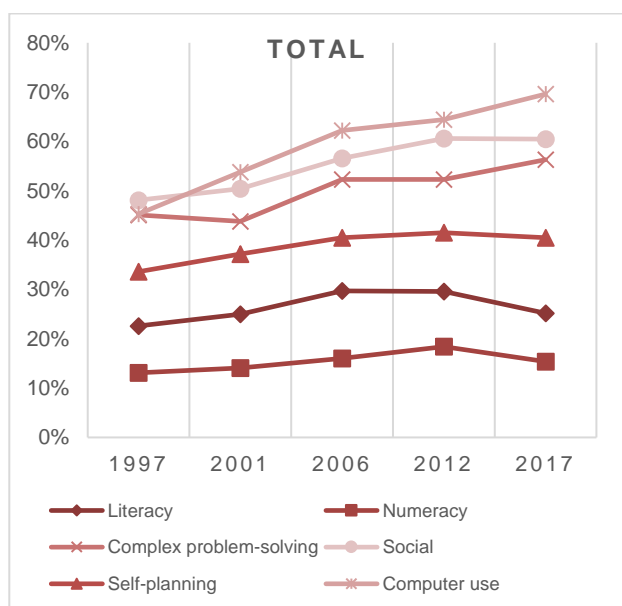
To trace the impact of technical and organisational change, SES questions workers about recent changes in the workplace. Drawing on this, we identify whether there was a change in the way work was organised, and whether new communications, computerised or automated equipment was introduced into the workplace. We treat the former as indicator of *organisational change*, while the latter indicates *technical change*.

Trends in job skills as well as technical and organisational change may differ across occupation groups. We thus split occupations into three broad groups. Managers, professionals and associated professionals form a group of *high-skilled* occupations. The group of *middle-skilled* occupations comprises administrative and secretarial occupations, skilled trades and personal service occupations. Finally, sales and customer service occupations together with process, plant and machine operatives and elementary occupations are jointly labelled *low-skilled* occupations.

5. Findings

Generic Skills

Figure 1: High Level Generic Skills, 1997-2017

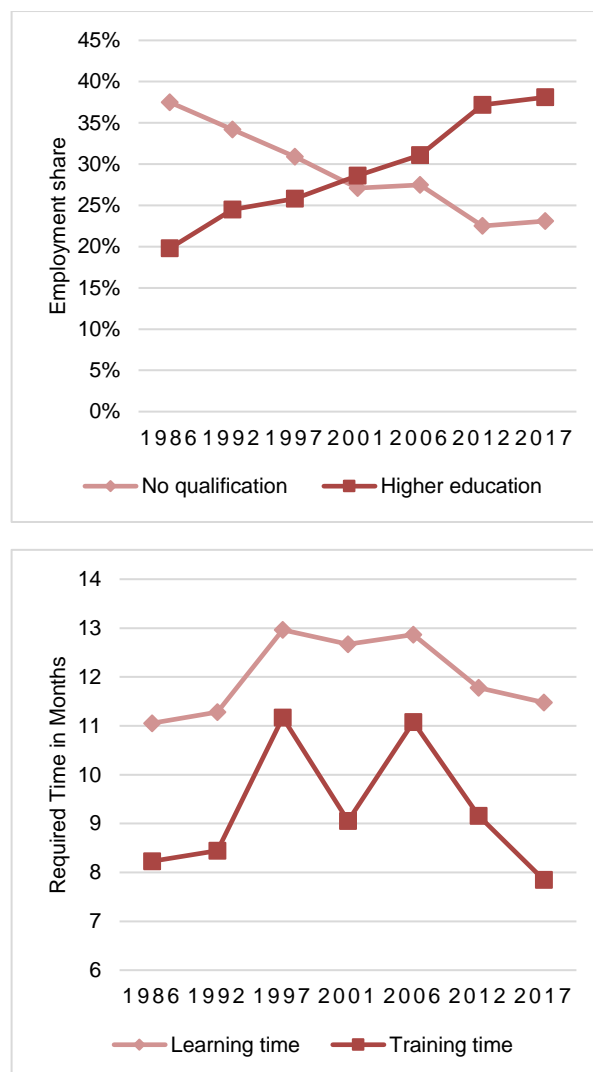


Compared with 2012, there is little consistent evidence for continued growth of generic skills (Figure 1). The use of high level literacy and numeracy skills has fallen. Social skills and self-planning skills have stagnated after a period of steady expansion until 2012. Against this trend, complex problem-solving skills have continued to become significantly more important. The fraction of jobs where complex problem-solving skills were essential or very important rose from 52% in 2012 to 56% 2017. Nonetheless, together these patterns indicate a slowdown in the demand for high level generic skills since 2012. This contrasts with an unbroken growth of high-level computer use since 1997. Consequently, whereas until 2012, trends in

generic skills demand and computer usage were both upwards, they have moved in different directions since 2012.

A breakdown by broad occupation groups, suggests that the fall in numeracy and literacy skills since 2012 was concentrated among high-skilled occupations, while complex problem-solving skills rose in jobs towards the bottom of the occupational ladder. The importance of computer use rose in jobs in high and middle-skilled occupations.

Figure 2: Qualification Requirements, Learning and Training Time, 1986-2017



Qualification Requirements

This picture of a stagnating or even reversing demand for skills receives support from trends in qualification requirements and learning and training times. Until 2012, the share of graduate-level jobs in the workforce expanded steadily by around three percentage points every five years since the series began in 1986. Over the same period, the fraction of jobs that require no formal qualifications diminished (Figure 2, top panel). Since 2012, however, these proportions have not changed significantly. In 2017 23% of jobs required no qualifications on entry, while

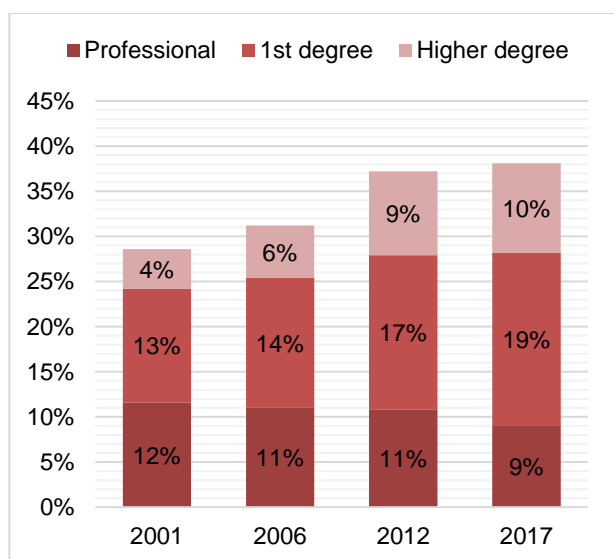
around 38% of jobs needed at least higher education qualifications.

If formal qualification requirements have not changed significantly, perhaps skills acquired in work have become more important. However, this does not seem to be the case: learning and training time have continued their downward movement since 2006 (Figure 2, bottom panel). By 2017, average training time had fallen to 7.8 months – below the level observed in the mid-1980s. Learning time has followed a similar, though, shallower path. After peaking at around 13 months to learn to do the job well in the 1997-2006 period, it has dropped to 11.5 months in 2017.

Post-graduates and Post-graduate-level Jobs

The shift towards higher education has been a major force of change in the British labour force. The massification of higher education has been accompanied by increased differentiation between graduates. In the process, not only have graduates become more diverse, but also the jobs that require higher education have become more differentiated. Thus far, we have treated jobs that require qualifications from professional certificates to doctorates as identical. Now, we break the category down.

Figure 3: Jobs Requiring Post-graduate Qualifications, 2001-2017



Over the 21st century, there has been an expansion of jobs that require qualifications beyond a first degree (Figure 3). Their employment share rose from 4% in 2001 to 10% in 2017. But, as before, it appears that this expansion may have faltered after 2012. In fact, there was a contraction in the share of jobs requiring professional qualifications which fell from 11% to 9% between 2012 and 2017, while jobs needing a first-degree rose from 17% to 19% over the same period.

Has the expansion of post-graduate positions been sufficient to absorb the growing number of post-

graduates? According to our data, about one in two post-graduates worked (51%) in a job at his or her qualification level. Another quarter worked (26%) in jobs for which a first degree would have sufficed according to the job holder. The remainder (23%) were in positions which did not require some university education. These figures have not changed significantly over the 2001-2017 period. Overall, post-graduates have managed to maintain their labour market position.

Gender Convergence

Not only has the labour force become better educated, but the economy has also made strides towards greater gender equality. Women have not only caught up, but have overtaken men in jobs that require higher education (Table 1). Also, gender differences in training or learning time have narrowed or vanished over the last 20 years. In our data, women have never been better positioned in terms of job skills than today. Nevertheless, much still needs to be done to translate greater gender equity in job skills into equal pay as evidenced by the persistence of the gender pay gap.

Table 1: Gender Gaps in Knowledge Requirements in 1997 and 2017

Job Skills	Year	Male	Female	Gender gap
Higher education required (%)	1997	28.0	23.0	-5.0
	2017	36.0	40.0	4.0
Training required (months)	1997	13.0	9.9	-3.1
	2017	7.5	7.7	0.2
Learning required (months)	1997	15.8	9.8	-6.0
	2017	12.2	10.3	-1.9

Technical and Organisational Change

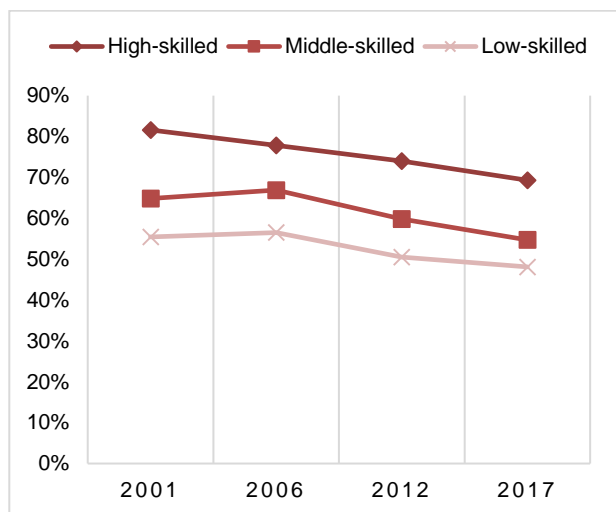
According to a large body of research, technological change and changes to the way work is organised are behind much of the rising demand for skills. Using SES, we examine trends in these potential drivers as experienced by workers and their contribution to rising qualification requirements. To get robust answers about changes that have occurred at work, SES only asks respondents who have remained in the same job with the same employer for at least one year.

Because technological change is thought to complement skilled workers, the expectation is that change will be reported more frequently as we move up the occupational skill hierarchy. But as ICT is maturing, we might also expect that new vintages of ICT will become less skills-demanding.

Organisational changes such as enhanced worker involvement or greater job control will also complement skilled workers who generally command the planning skills to thrive in

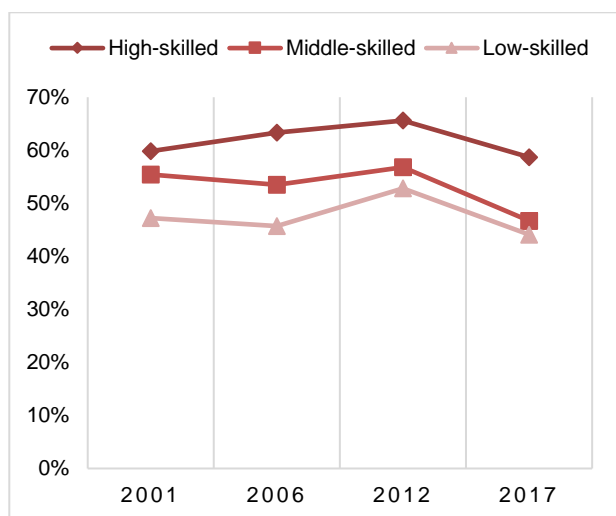
environments with more decentralised decision-making. As with technical change, we therefore expect the incidence of organisational change to rise over the occupational skill hierarchy. Whether organisational change is becoming more or less skill biased with time is, however, an empirical question.

Figure 4: Technical Change by Broad Occupational Group, 2001-2017



These conjectures are broadly confirmed by our data on technical change (Figure 4). First, workers in more skilled positions experience a greater incidence of technical change. Second, the incidence of technical change has been falling continuously since 2001 in high-skilled occupations and since 2006 across all occupation groups. Compared with 2006, the fall was sharper for workers in middle-skilled occupations than for workers at either end of the job skill ladder.

Figure 5: Organisational Change by Broad Occupational Group, 2001-2017



By contrast, the incidence of organisational change rose up until 2012, but has since declined (Figure 5). The initial upturn was greatest among high-skilled and low-skilled occupations. The subsequent

downturn was sharpest for workers in middle-skilled occupations. Consequently, while in 2001 the incidence of organisational change for workers in middle-skilled was similar to that in high-skilled occupation, it has since dropped to the average levels of jobs at the bottom end of the job skills ladder.

Has technical and organisational change become more or less skill-biased in the process? To answer this, we correlate the intensity of technical and organisational change with job skills demand, indicated by graduate-level qualification requirements. The results suggest different trend patterns by type of change. While the correlation coefficient of graduate-level qualification requirements with technical change fell from 0.32 to 0.20, the correlation coefficient with organisational change rose from 0.13 to 0.24 between 2001 and 2017.

The introduction of new ICT at workplaces appears to have become less skills demanding. This is corroborated by a falling proportion of survey respondents who state that additional computing skills would enable them to do their job much better. The proportion roughly halved from around 25% in 2001 to 12% in 2017.

The skills bias nature of ICT may thus have been transitory. As has been suggested in other research, the maturing of ICT and its more widespread use, makes the adoption of new vintages of general-purpose ICT a familiar and less skills-intensive process. But at the same time, changes in the way work is organised increasingly complements high skills.

6. Policy Implications

Three key findings emerge from this report. First, growth of skills demand has slowed since 2012. Second, women have caught up and in some respects overtaken men in terms of job skills intensity. Third, the economy has faced the double whammy of a slow-down in technical and organisational change that, in the case of technical change has become less skills demanding.

In 2017, the UK government has laid down an ambitious industrial policy to prepare the British economy for a future after Brexit. Its high skill strategy, however, relies on an assumed virtuous circle where an expanded supply of skilled workers will in the long-run result in an upskilling of the economy as a whole. The gathered data here suggests that this assumed connection may not be sufficient to shift the economy alone towards greater skills use. What is needed are longer-term, consistent political strategies that combine a focus on skills supply with some attention to demand side developments to ensure that investments into skills supply are effectively utilised. The extended programme of sector deals, if designed well, may be a promising step in this direction.

Further Reading

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All titles, along with technical reports, are downloadable free from the survey website at www.cardiff.ac.uk/ses2017 (1-3 after 18/7/18; 4-6 after 2/10/18).

Also you may like to take the Job Quality Quiz which is an additional output emanating from the project, www.howgoodismyjob.com

Author Affiliations: Golo Henseke and Francis Green – LLAKES, UCL Institute of Education; Alan Felstead – Cardiff University; and Duncan Gallie – Nuffield College, Oxford.

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