The Declining Volume of Workers' Training in Britain

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Abstract.

The conventional focus on the training participation rate, rather than training volume, in official statistics and research has obscured a radical transformation in workers' training in Britain. To obtain a picture of the trend in training volume, we synthesise a narrative through a new analysis of multiple surveys. The duration of training fell sharply with the result that the training volume per worker declined by about a half between 1997 and 2012. This fall is hard to reconcile with optimistic rhetoric surrounding the knowledge economy. Potential explanations are discussed. We conclude with recommendations to improve the collection of training statistics.

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1. Introduction

Although much has been gleaned about workplace training and certain regularities uncovered, the diversity of data sources and the sporadic dissemination of their findings have delivered only a piece-meal appreciation of the big picture surrounding the trends in job-related training. Many commentators – ourselves included – have as a consequence hitherto missed the fact that in the last 15 years there has been a sea change in the volume of training received by the average worker in Britain.

Training matters enormously because of the importance of skill formation at work in a modern-day economy. There is therefore a need to optimise relevant government policies, and the European Union accordingly has set targets for participation in adult learning. With the revelation of low and unequal literacy and numeracy skills of young adults in England and Northern Ireland, the training trend becomes especially important in Britain for the future skills of the adult workforce (OECD, 2013). Estimates of the returns to training are generally positive and substantial, both in Britain and elsewhere (e.g. Blundell et al., 1996; Dearden et al., 2006; Vignoles et al., 2004; Booth and Bryan, 2005; Brunello et al., 2012).

Unfortunately, most analyses and official public statistics concerning training have focussed exclusively on the participation rate in training. Yet the participation rate is a poor indicator for the contribution of training to skill formation, because the duration of training varies very considerably over time and between countries and workplaces. The focus on participation thus has the potential to be misleading. Data on the volume of training – which, along with quality, is the best indicator of training's contribution to skill formation – by contrast has been scattered and sparsely disseminated.

Our first main objective in this paper is to demonstrate and call attention to the major change in training volumes in Britain. This change has hitherto been neither debated nor recognised. In order to achieve this, we draw on multiple sources to synthesise a picture of training volume trends for the first time. As a subsidiary to this first objective we also consider the significance for skill formation of the revealed trends, and point to what would be needed to achieve an adequate understanding of what lies

behind them. Our second main objective follows from the first: by exposing the problems arising from an exclusive focus on the participation rate, we hope to influence the future collection and dissemination of training statistics.

Following a review in Section 2 of how training trends relate to the concept of the knowledge economy and of relevant prior empirical studies, in Sections 3 and 4 we bring together findings about training trends from multiple high-quality surveys. Because the narrative has been scattered in multiple sources, mostly unpublished, their message has been missed. Interpreting and explaining the change is not straightforward; in Section 5 we discuss potential explanations and suggest what might be needed to test them in future. In the Conclusion we propose that analysts and policy-makers concerned with training and learning would profit from an improved statistical service, and conclude by offering recommendations.

2. Training and the Knowledge Economy.[1]

Theories of the modern economy bring contrasting expectations about training. The assumption that industrialised economies have become, or are becoming, knowledge-based carries hypotheses about the level and trend of workplace skill formation. The knowledge-based economy is characterised also as a learning economy (OECD, 1996). If technological change is substantive and skill-biased, the new needed skills could not be delivered only through the education system, for two fundamental reasons: first, most of the adult population is at work, so the pace of expansion of skills in the workforce would be limited by the natural pace at which new generations of college-leavers replace retirees; second, many of the new skills can only be acquired in work settings. If an economy is assumed to be already a fully-fledged knowledge economy, one expects to see higher levels of workplace skill formation (relative to previous eras) to generate both the work skills that cannot be learned during school and college education, and the new skills that become needed through innovation-driven growth. If, rather, it is claimed that a country is transitioning towards being a knowledge economy, then the presumption is that skill formation will be rising.

In the knowledge-economy literature, this prediction about skill formation is typically translated into an expectation and objective that training will be increasing in the

period of transition towards a knowledge economy, and to be sustained at high levels thereafter. In Europe, increased access to training has been stressed by the European Council as integral to its strategy for competitiveness, and in particular for achieving its 'Europe 2020' objectives in its 'Agenda for new skills and new jobs' initiative (European Council, 2007). Since it also has become widely recognised that wage compression and various labour market imperfections that inhibit mobility are sufficient to give firms the incentives to contribute to funding transferable as well as firm-specific training (e.g. Stevens, 1994; Acemoglu and Pischke, 1998), it is expected that firms and individuals would both be increasing their investments in transferable skills as the knowledge economy develops.

Yet such a prediction may not be warranted. Notably, there has developed a considerable critique of the concept of the knowledge economy. Writers point to the contradictions of the skills race in an increasingly globalised economy, seeing the 'global war for talent' and its associated discourse, for example, as a new phase in the development of neo-liberalism, and highlighting the constraints on training policies (Markowitsch et al., 2013). Many are especially sceptical of the idea that Britain can be characterised as a knowledge economy. Critics hold that the country has been on a low-skills trajectory, and question the strength of the putative increasing demand for workplace skill formation. Rather, the British economy is in this view likely to retain a large tranche of low-quality jobs, a weak set of occupational identities that diminish incentives to learn, a narrowly conceived vocational training system that lead to vocational qualifications that have little worth on the labour market, and a low employer demand for qualifications relative to employers in other developed economies. Compounding these problems Britain's especially flexible labour market, it is maintained, exacerbates the externality problem that firms face, discouraging them from funding transferable training in the absence of cooperative solutions. Among the important critiques in this mould are Finegold and Soskice (1989), Crouch et al. (2001), Mayhew and Keep (2010), Brown and Tannock (2010) and Keep and James (2012). And, capping these structural critiques, others identified a failure on the part of the Labour government that took power in 1997 to introduce a transformative skills agenda, its programme lamented as “long on rhetoric and vision, but ...rather short on delivery” (Taylor, 2005: 109; see also Holford and Welikala, 2013).

Whatever position one takes about the knowledge economy theory and its critique, the demand for skill formation is seen as highly dependent on the selected path of development, encompassing economic, fiscal and institutional drivers and evolving management strategies (Green, 2013). The knowledge-economy may be presented as an aspiration, but whether it is becoming a reality is an open question. A fair generalisation is that those who proclaim the reality of the knowledge-based economy expect to see an increasing volume and quality of training as the knowledge-economy develops. To what extent has this expectation been realised in recent decades?

It has been surprisingly difficult to answer this seemingly simple question. Although the trend in the volume of workplace training should be one of the central variables characterising the model of a knowledge economy, descriptions of training trends over the long term are rarely focussed on indicators for the important concepts. Above all, indicators for the volume and quality of training are needed. The key volume indicator is the time per worker spent in training in a given period. Quality is constituted by training's putative generative impact on skill; this could either be measured for each unit of training undergone (to be referred to as "unit training quality"), or for the total training in the given period (to be referred to as "total training quality"). Also relevant is the training investment cost (both direct and opportunity cost), which combines the volume and the price of the investment.

Commentary on continuing workplace training has, however, largely centred on the participation rate (UKCES, 2009), not the volume. Because the participation rate over a four-week period had become somewhat higher than in the 1990s, then coasted along at around 15%, workplace training was not news. Unlike with education and youth training, the country came out quite well in international comparisons of workplace training participation rates (Leitch Review of Skills, 2005). Recently some commentators have noted the fact that participation rates had edged a little below their peak in the early 2000s (Clancy, 2009; Mason and Bishop, 2010; Mason, 2010).

Meanwhile most academic analyses have also focused on participation rates (e.g. Murphy et al., 2008; Jones et al., 2007; Boheim and Booth, 2004; Booth and Bryan, 2005; Vignoles et al., 2004; Dearden et al., 2006; Roosmaa and Saar, 2012). With exceptions (e.g. Hoque and Bacon, 2008) duration and quality were neglected in quantitative studies despite earlier indications that the trend in the volume of training could be in the opposite direction to movements in the participation rate, and that

training quality was also of concern (Felstead et al., 1997; 1998; 1999; Green and Zanchi, 1997). The volume and quality of training have since been largely off the radar, despite their prominence in qualitative studies of training and in the debate about apprenticeships (Gospel, 1998; Felstead et al, 2009). No data on trends in the volume or quality of training are published in official sources.

3. Methodology and Data

In addressing this lacuna, we began with awareness of the fact that training measurement can sometimes be problematic, owing to the multiplicity of forms that training takes (including informal training), and to respondents' difficulties of recall over long periods (Felstead et al., 1999). Our strategy was to piece together a description of training trends from all available trustworthy sources that covered the previous two decades; even if they gave different numbers because they referred to different definitions or periods of training, it was hoped to find that the pattern of change over time would be consistent across sources.

We found eight series of surveys of individuals and three of employers, covering all available series which have data on some aspects of training in two or more years, and which are of high quality and representative of either the UK as a whole or of one or more UK nations. The series are (with source references at the end of the paper): the British Household Panel Study (BHPS), the Continuous Vocational Training Survey (CVTS), the Employer Skills Survey (ESS1), the European Social Survey (ESS2), the European Working Conditions Survey (EWCS), the NIACE Survey on Adult Participation in Learning, the National Adult Learner Survey (NALS), the Quarterly Labour Force Survey (QLFS), the Skills and Employment Surveys (SES), and two Workplace Employment Relations Surveys (WERS).

4. Findings

In what follows we report figures derived from our own analyses of the surveys, or in a few cases from a public database or survey report. The salient features of training trends that emerge are summarised in Table 1.

a) Aggregate Training Volume.

The Individual As Informant.

To capture training comprehensively the Skills and Employment Surveys (SES) specify explicit types of job-related training: training off-the-job, receiving instruction while performing the job, self-teaching with manuals, internet etc., following a correspondence or internet course, taking an evening class, other job-related training. They show that the annual training participation rate (among those aged 20 to 65) rose a little, from 65% in 2006 to 68% in 2012. The surveys also asked respondents to report the number of separate days during the year in which they took part in each form of training. The total number of days for all forms of training declined substantially: in 2006 41% of training recipients had received training on no more than 10 days in the year; this proportion rose to 49% in 2012; the median number of days fell from five to four. Including those not training, we find an overall reduction in training volume from 51.2 to 34.9 annual days per worker, a fall of 32%.[2]

The Quarterly Labour Force Survey QLFS records whether participants had "taken part in any education or any training connected with your job, or a job that you might be able to do in the future" – a question which, since it is not anchored with examples and is in a minority of cases addressed to proxies, probably captures fewer training episodes than SES. Supplementary questions permit study of training duration for those participating in the previous week only, and of the length of the latest training spell.

Figure 1 presents the commonly-cited 4-week participation rate. It shows that among the employed the training participation rate was rising through the 1990s, going from 12.8% in 1995, arriving at a peak of 15.1% in 2001. It then fell by more than two percentage points to 13.0% in 2010. Thereafter it has remained roughly steady. The figure also reconfirms the conclusion that there were no sharp breaks around the time of the economic crisis in 2008-9 (Felstead et al., 2012). Figure 1 also shows that this inverted U-shape for the participation rate of the employed is not compensated by job-related training among the non-employed population; for these groups participation was also higher in the first part of the 2000s than either before or later. From here on all findings refer exclusively to training for employed persons.

Figure 2 shows what has been happening to the length of training episodes. Respondents who had trained in the four previous weeks were asked to state the total

length of the course. The proportion lasting less than a week, just over a third in the mid-1990s, was steadily rising through the 2000s. In 2012 a half of reported most-recent training episodes lasted less than 1 week. A second, indirect indication of duration is also shown in Figure 2 in the proportion of training in the 4-week period that is undertaken either partly or wholly "away from your job". Off-the-job training tends to be of longer duration than training on the job, and as a share it has fallen steadily, dropping 17 percentage points from 73% in 1995 down to 56% in 2012.

The QLFS data also includes consistent data on training duration in hours per week (the item remained identical in wording, and preceding items were also the same) for all quarters over 1995-1998, and for the second quarters of 2006-2010. Because training is seasonal, we restrict our time series comparison to training in the reference week during the second quarter. Figure 3 combines participation with weekly duration. It shows the remarkable finding that training volume – the average training hours per week per employed person – fell substantially between 1997 and 2006, then continued to fall until 2009. The best estimate of the decline in volume over the 1997-2009 interval is from 1.24 to 0.69 hours per employed person, a startling cut of 44%.[3]

Further independent support for a picture of falling training volumes among the employed during the 2000s comes from the British Household Panel Study (BHPS). The sample is longitudinal, but its representative character is maintained through refreshment. We focus on those aged over 16. From the 2nd wave (1992) to the 7th employed respondents were asked whether, since September of the previous year, they had "taken part in any education or training schemes as part of your present employment". A follow up question, which became consistent after wave 3, asked them to estimate the total hours spent in training. Although this question refers to a period which varies between respondents depending on their date of interview, for the large majority the period is approximately one year, and the interval is known and can be allowed for. From 1998 on the question was amended to: "(Apart from the full-time education you have already told me about), have you taken part in any other training schemes or courses at all since September 1st (in the previous year) or completed a course of training which led to a qualification? Please include part-time college or university courses, evening classes, training provided by an employer either on or off the job, government training schemes, Open University courses, correspondence courses and work experience schemes." This amendment is a bit of a

mouthful, and neither indicator, before or after the revision, captures on-the-job training if it is not perceived to be a “scheme” or a “course”. The survey then asks about the duration of each course of training (up to three, selecting the longest).

Figure 4a shows that the participation rate rose somewhat from 31.0% in 1992/1 to 33.1% in 1997/6. This rate is substantively lower than that recorded in the Skills Surveys, confirming the suspicion that not all training activities are captured. Yet the interpretation could be expected to be consistent over time. Figure 4a also shows a rising participation rate in "long" training (defined as more than five hours) over this period. With the revised indicator from 1998 onwards shown in Figure 4b, the annual participation rate held up at around 30% until 2005, and a decline set in thereafter, reaching 26% in 2008. The duration of training courses also fell, with the result that participation in "long" training also trended downwards, dropping 4 percentage points between 1999 and 2008, with 2005 an above-trend exception. The combined consequence of falling participation after 2005 and the longer trend of falling duration is that, over the decade, the volume of training fell substantially. Averaging over successive waves, the monthly average training volume in 1998 and 1999 was 0.68 days per month; this fell to 0.50 days per month in 2007 and 2008, a drop of 26.5%.

Three further sources of information about the trend in the annual participation rate in work-related training are noteworthy. In the European Social Survey (ESS2) respondents are asked: "During the last twelve months, have you taken any course or attended any lecture or conference to improve your knowledge or skills for work?". The proportion answering yes fell significantly from 53.7% in 2006-7 to 46.4% in 2010-11. Second, using a somewhat broader concept of training but still focusing on those in paid employment and using the year as reference period, the European Working Conditions Survey (EWCS) asked about "Training paid for or provided by your employer or by yourself if self-employed" and "on-the-job training". With this, the proportion engaged in one or both types of training was 54.7% in 2005 and 56.9% in 2010, with the difference statistically insignificant. Third, the Workplace Employment Relations Survey (WERS) asks employees whether they have participated over the previous 12 months in training other than for health and safety. The reported participation rate rose from 73.3% in 2004 to 78.0% in 2011 – high compared with other surveys in part because it only covers establishments of more than five workers. Yet it also shows a fall in volume: all of the increase in training

participation which it records is of the less-than-two days variety, while the participation of employees in training for more than 10 days fell from 8.2% to 6.1% -- the latter outweighing the former in its effect on average volume.

Thus, in respect of the annual participation rate in the latter half of the 2000s, two series show a fall in small fall in participation (ESS2 and BHPS), while EWCS suggests stability, and two (SES and WERS individuals) report a small rise. Nevertheless in the three of these survey series which provide relevant evidence, training volume falls by very substantial amounts.

Finally, two surveys of individuals cover both work-related and other learning: the NIACE survey and the National Adult Learner Survey (NALS). They each use a three-year period which is conducive to unreliable measurement. The NIACE survey series reports long-term stability around 40% in the 3-year participation rate from 1996 through to 2011 but with some fluctuations. The NALS, using a complex diary method to try to cover all learning activities, finds a much higher participation rate and reports that the proportion learning rose from 74% in 1997 to 80% in 2005, thereafter falling dramatically to 69% in 2010. This especially severe cut in participation could be an artificial consequence of data collection being interrupted for the 2010 General Election.

The Manager As Informant.

Three survey series deliver useful managerial information about annual training trends. They show that the employers' perspective is broadly in line with the individual-level surveys.

Thus the Employer Skills Surveys (ESS1), which cover very large samples of employers in England, show that the proportion of establishments that funded training for any of their workers in the preceding twelve months remained stable at around two-thirds, from 2005 through to 2013. Between 2009 and 2011 they report also on training volumes: a 6.4% fall in training days' per annum per employee from 4.7 to 4.4. Meanwhile, in WERS, the proportion of "high-training establishments" (those that provide off-the-job training to at least 80% of the largest occupational group) rose within three occupational groups between 2004 and 2011, fell within one, and remained unchanged within four groups. But the length of training fell: the share of training establishments where experienced employees received 10 or more days of

training fell from 14% to 10%. Finally, the European Union's Continuous Vocational Training Survey shows a fall in the enterprise-level participation rate from 87% to 80% between 1999 and 2010. It also shows a fall in training hours, but we consider this data less reliable owing to a high proportion of missing values on the hours question put to managers. [4]

b) Training Investment Expenditure.

Training investment figures corroborate the above picture of declining training volumes. The Employer Skills Survey – the best data source on this -- estimates that total employer investment in training in England was £33.3 bn in 2005, and £40.5 bn in 2011 (Davies et al., 2012). Once inflation is factored in, this represents just a 4% increase, and since the workforce expanded during the interval it represents a real terms cut of 14.5% in training investment per worker. A further cut in the unit resource is reported for between 2013 and 2011 (Winterbotham et al., 2014). The Continual Vocational Training Survey reports similarly that there was a substantial cut of 29.3% in respect of training costs per employee in the UK as a whole, over the interval 2005-2010.[5] One can conclude that, unless hourly training costs fell, training volumes per employee were cut.

c) Training Quality.

It might be suggested that, to counterbalance the substantial cut in volume, training became more efficient – in other words, its unit training quality may have improved (Felstead et al., 2012). Unfortunately, notwithstanding earlier influential qualitative studies (e.g. Steedman et al., 1991), little attention has been devoted to studying trends in training quality in the aggregate. The QLFS asks whether the training leads to a qualification or a credit towards a qualification. Between 2005 and 2010 (2nd quarters) the certified proportion of the 4-week training incidence ranged with no trend between 44% to 47%. A similarly flat trend is reported from the Employer Skills Surveys (ESS1) for the period between 2005 and 2011, from the SES between 2006 and 2012, and from the BHPS between 1998 and 2008. Yet certification is at best a partial indicator of quality. While substantial gains from work-based training are found in most studies, studies of the association between adults' qualification

gains and subsequent pay rises present a mixed picture, with some showing mostly zero economic returns (Wolf et al., 2006; Evans et al., 2013). Moreover, the development of the competence movement enabled some certificates to be awarded after little training, through the recognition of existing skills. The persistence of certification may be due to the preoccupation of government policies with targets and consequent effects on funding streams.

The SES series offers some alternative information, derived from workers' reported experiences of training. Between 2006 and 2012 there was found to be little change in the proportions reporting that the training improved skills "a lot". However, there was a rise from 27.3% to 31.7% in the proportion of trained workers for whom the increased skills were non-transferable outside the industry. There was also a small but statistically significant fall from 59.6% to 57.0% in the proportion reporting that the training "has made me enjoy my job more".

These findings give just a weak hint of declining quality. But the evidence remains unclear and patchy, and our overall conclusion is that the available aggregate data on training quality are not good enough to evaluate the trends.

d) Training Volumes and the Changing Socio-Economic Composition of the Workforce.

In the next section consideration will be given as to how far it is possible to arrive at a satisfactory explanation of the decline in training volumes in Britain. Prior to that discussion, an obvious question surrounds whether the trends are concentrated among certain groups. To what extent is the decline associated with the changing personal characteristics of the labour force, and has the decline been greater or less among some types than others? On the demand side, there is a parallel question: to what extent is the decline associated with the changing structure of industry? Also of interest, to what extent is the decline experienced differentially across each occupational group or region, and is the decline felt more for smaller or larger establishments?

We addressed these issues using the QLFS with its large samples. To examine change over the longest period, we pooled the 2008, 2009 and 2010 data, treating this as our end date, then compared this with the pooled 1995, 1996 and 1998 data. We focused

on several categories that have been shown in the literature to have a significant association with training – age, gender, prior education, industry, occupation, region and workplace size (e.g. Green, 1993; Green and Zanchi, 1997; Jones et al. 2007). Table 2 presents the results of regression models that examines the association of individual characteristics with training volume. Model (1) shows the 'raw' absolute decline in training volume, 0.43 hours, over the period; this fall compares with average training hours over 1995-1997 of 1.17 hours. In Model (2) controls are entered for gender, education and age categories, all of which are related in the expected way with training. The effect of their introduction is to make very little difference to the coefficient on the trend; thus, we can conclude that the decline in volume is not accounted for by the changing personal characteristics of the workforce. In Model (3) the covariates are interacted with the time trend. Men's training volume fell a little further than women's. Training fell a little faster among those with higher education, though this is set against a much higher start-point. The fall in training volume is by far the greatest among the young (under 30).

Tables 3a to 3d present the results of models which look in turn at different aspects of the demand side. Table 3a considers industry. It examines whether training volume declined at faster or slower rates within some industries, after conditioning on the differences in personal characteristics. The decline in conditional training volume is found in all industries but is significantly greater in Hotels and Restaurants; since this began as a high-training industry, this implies a small degree of convergence.

Table 3b examines whether training was especially fast in some regions, again after conditioning on personal characteristics. Compared with Tyne & Wear, the reference region, we see that conditional training volume fell significantly further in several regions, and fastest in Innder London, South Yorkshire and Northern Ireland. In the latter case, this fall exacerbated the fact that Northern Ireland was already a low training region. Table 3c does the same exercise for major occupation groups. It shows that, compared with Managers, conditional training volume fell significantly faster among Professionals, Associate Professionals and Service Occupations. Finally Table 3d shows that the fall was statistically neither higher nor lower in large workplaces compared with small ones.

These industrial, regional and occupational changes are of course inter-related, and these in turn are associated with changes in workforce characteristics. To assess

whether, collectively, the changing composition along all these dimensions can account for the decline in training volume, we carried out a standard Oaxaca-type decomposition analysis. This analysis revealed that, of the 0.426 raw decline (as shown in Table 2), just 0.015 can be accounted for by the changing composition. Thus, virtually all the change is happening within socio-economic categories, albeit to varying degrees as indicated by Tables 3a to 3d.

5. Discussion.

What our extensive investigation with multiple data sets has revealed is that a focus only on training participation rates yields a highly misleading picture about what has been happening to the workers' experience of training over recent decades. When the period analysed is a year, surveys indicate a mixed picture during the 2000s with some showing small rises, others stability, and one, the BHPS, showing a fall in the participation rate. With the four-week analysis periods of the QLFS there is a slow rate of change, including an inverted-U-shaped pattern of participation with rates peaking in the early 2000s. Hitherto ignored, the story about training volumes, by contrast, is both different and more striking: the length of training episodes has been shortening, much less is off-the-job, and the three best direct sources on training volumes tell us that there have been very substantial cuts since the late 1990s.

The QLFS shows a reduction of 44% in weekly training hours during the 12 years from 1997 and 2009; the BHPS indicates a 26% cut in annual training hours over the 9 years from 1998. Though definitions and periods do not coincide, the story seems clear. Then, from 2006 to 2012 the SES series records a volume decline of 32%. The trend is confirmed in two employer surveys, and by parallel indications of declining funding for training. Whether the falls have been accompanied by changing training quality remains an open question. The cuts were economy-wide, but with some variation in intensity. Taking the whole period from 1997 till the present, if we add the QLFS finding for 1997 to 2009 to the ESS1 finding, it is estimated that training volume fell by just under a half (48%) between 1997 and 2011. Alternatively one could use the SES measure for 2006 to 2012 together with the QLFS measure of decline between 1997 and 2006 (31%) to arrive at an estimated fall of 53% between 1997 and 2012. One should not take these synthesised estimates too precisely because

the surveys ask about training in somewhat different ways; nevertheless, it is fair to state that the volume of training per worker has been approximately halved since 1997.

In the context of the characterisation of Britain as a "knowledge economy", this radical decline in training volumes over 15 years is unexpected. From the scarce published evidence, the decline appears to be unusual among the more developed economies. The CVTS series suggests that the time spent on training in enterprises in the form of courses may also have fallen substantially in Sweden between 1999 and 2010, but this was from a much higher base than in Britain; overall in Europe there is no clear trend, though substantive increases from a low base are reported in several East European economies (Markowitsch et al., 2013; Mignon, 2013).

The decline in Britain is a puzzle which may be impossible to fully unravel in retrospect, given the piecemeal nature of the information sources. We can with reasonable confidence set aside two possibilities. First, though an upward shift in the real cost of supply cannot be completely ruled out, we think it unlikely in an era of technological change in training delivery. Qualitative findings from employers suggest, if anything, the opposite (Felstead et al., 2012). Second, there has been no evidence of a deteriorating mismatch between training demand and supply. The decline thus almost certainly reflects a fall in demand for training hours. And, as the analysis of Section 3d) showed, the changing socioeconomic structure does not begin to account for the fall.

Contrasting explanations for the fall will have different implications for our understanding of the knowledge economy. We highlight four possible accounts. First, following the managerial approach a fall in training demand could be attributed to managers becoming less optimistic about the value of skill formation for their businesses. Such a change could be privately rational if it reflects an unbiased estimate that the expected private returns from training have fallen in an increasingly flexible economy, or it might be simply a consequence of evolving business strategies in the context of deep uncertainty (Green, 2013). In this perspective, a falling demand for skill formation is inherent in a "low-skills" trajectory for large swathes of the British economy, representing a trend away from the knowledge-economy. Union power, which is generally found to be positive for training (Green et al., 1999; Boheim and Booth, 2004), has been declining, thus pulling the training trend in the

same direction. During the period of training decline investment in fixed capital and in R & D, which might if it had risen increased the demand for skills, remained steady at only 17% of GDP until the 2008-9 recession when it collapsed to 14%; while investment in R & D remained unchanged at the relatively low figure of 1.8% of GDP. This narrative is clearly consistent with critiques of the knowledge economy.

Yet there are alternative accounts. A second explanation for training decline might be that, for a given level of job skill requirements, prior education may substitute for current training, and since education levels in the workforce have risen less training is needed. Given that education has expanded everywhere, this explanation might seem more convincing if training volumes had declined in most countries. Nevertheless, another substitute source of skills could be migrant workers.

A third explanation is that there could have been a radical transformation of the training function over the last fifteen years, greatly improving its efficiency. This gain might have derived from new training technologies, or from better targeting of training at employers' own needs in relation to their business strategies. In this explanation, this is the age of lean training, increasingly rational from a private perspective. However, from a social perspective lean training may also entail greater narrowness and a lower social return to training, which would still be pessimistic when set against widely-held aspirations for the knowledge-economy.

A fourth possible explanation of falling training volumes, however, has more positive ramifications. Theories of workplace learning in recent decades stress the significance of learning through participation in workplace activities, through working in teams, and through involvement in 'communities of practice' (e.g. Guile, 2001; Felstead et al., 2005; Lam, 2002). The 'learning organisation' is both an ideal and a proposition about the prevailing trend of a knowledge economy. As learning and development practices evolve, it is possible that workplace learning could become less associated with training (Kessels, 2001). Thus, processes of learning may have become better embedded in organisations, at least in those that have adopted high-involvement working practices. A careful design of work organisation, incentives to facilitate employee involvement, and inter-firm mobility in technologically dynamic regions may be enabling new forms of skill formation through tacit knowledge-sharing that substitute for the typical forms of training reported in surveys. Some SES evidence is consistent with this fourth explanation: the proportion who strongly agreed that they

could "learn new skills through working with other members of my work group" rose from 52% to 60% between 2001 and 2012.

Yet, without discounting this last narrative -- whereby training may be being substituted in part by other forms of learning -- it is hard to reconcile the fact of the radical decline in the volume of worker training in Britain with the rhetoric of the knowledge economy. Further data-gathering would be needed to distinguish between the competing explanations. One would need at a minimum a data source that includes indicators of management strategy, alongside measures of the learning environment in jobs, personal characteristics including prior education or (better) the skills requirements of jobs, a good measure of training volume, and indicators of training quality. Unfortunately, none of the existing data sources include these together: the nearest is the SES, but this series does not include training consistently measured before 2006, and has no direct indicators of management strategy independent of the workers' experiences of them. The WERS matched employer-employee survey series provides, by contrast, a suitable vehicle for estimates of management practices, but has not enquired about skills strategies and learning environments. To study future changes it would be useful to be able to collect quantitative data of this kind. But to gain further insight into the puzzle of the recent declining training volume, alternative qualitative methods of business history, focusing on human resource practices, might prove to be the most viable way of understanding organisations' changing strategies.

6. Conclusion and Recommendations.

While empirically distinguishing between explanations is beyond the scope of this paper, the mere fact of the radical fall in training volumes is the most substantive finding from this study. One might therefore question why falling training volumes have hitherto not been studied.

One answer might be the view that it is participation in training that matters, rather than volume. Yet such a view is mistaken: while many studies of training's effects do not look at the impact of longer duration, those that do show that longer training matters (Blundell et al., 1996; Bartel, 1995). Equally, longer training courses are sure to cost more. A second answer could be that it has been more comfortable to focus on

participation. The UK's training participation rate, with its gentle inverted U-shaped path of evolution and its high standing by comparison with most countries in Europe, may have seemed of little concern. The UK's 'implementation' of Europe 2020 goals with respect to adult training has been seen as way ahead of the game (European Commission, 2011) because of the focus on the participation rate.

Another reason is the scarcity and difficulty of access to training volume data. The research for this paper entailed piecing together findings from a multiplicity of surveys and establishing whether there was a consistent picture. It has not been possible for analysts to look up training volume statistics on the National Statistics web pages.

In future, it ought to be possible to do this. Moreover, if workplace training is thought at all important for future prosperity, there needs to be an urgent improvement in the collection and presentation of statistics surrounding training volumes, and some progress in the measurement of training quality. Since the collection of improved training statistics would not be a simple matter, a collective effort could usefully be led by Government, drawing on a range of expertise from academics, businesses and unions. We conclude, therefore, with five recommendations for progress in the statistical understanding of training:

i. There should be an investment of collective effort to devise and present improved, regular training volume indicators, in support of public discourse and as an aid for training stakeholders across the UK.
ii. In parallel it should be considered how to generate suitable regular indicators of the quality of training. There may be a need to generate multiple indicators in order to build the fullest possible picture. It would also be of value to monitor trends in aspects of work organisation that are conducive to learning in workplaces.
iii. It is important to continue monitoring funding in a consistent way, that is, through repeat surveys of investment attached to the Employer Skills Surveys. To support any subsidy/taxation policy, there should also be improved data on the share of training funding by individuals, employers and government.

iv. Finally, especially for policy purposes it would be useful to have available more regular indicators of training mismatch, not least because training barriers are a prime potential focus for beneficial social interventions.

v. If it is hoped to understand and anticipate future changes in training volumes and quality, these data should also be collected alongside suitable surveys of management strategies and workplace learning environments in organisations.

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See van Wanrooy et al., (2013).

Table 1 Job-Related Training Trends in Britain By Data Source.

Data Source	Participation Rate [a]	Volume [b]	Funding	Total Training Quality [c]	Mismatch	Remarks
Individuals						
Skills and Employment Surveys (SES)	(1 year) **Small rise** between 2006 and 2012.	**Falls** by 32%, 2006-2012.	**No change** in funding share of employers, 2006-2012.	**Stable/ falls,** 2006-2012 (multiple indicators).	No evidence of worsening mismatch, 2006-2012	
Quarterly Labour Force Survey (QLFS)	(1, 4 or 13 weeks) **Rises** until early 2000s, **falls** thereafter.	**Falls** by 44%, 1997- 2009.	n.i.	n.i.	n.i.	More substantial falls after 2003, in Northern Ireland.
British Household Panel Survey (BHPS)	(~1 year) **Stable**,1998- 2005, then **falls** by 5 percentage points, 2005-2008	**Falls** by 26%, 1998/9-2007/8.	n.i.	**Stable**, 1998-2008 training certification	n.i.	
European Social Survey (ESS2)	(1 year) **Stable** 2004/5-2010/11.	n.i.	n.i	n.i.	n.i.	
European Working Conditions Survey (EWCS)	(1 year) **Stable,** 2005-2010.	n.i.	n.i	n.i.	n.i.	
Workplace Employment Relations Surveys (WERS)	(1 year) **Rises** by 5 percentage points over 2004 to 2011/12.	**Fall** in long-duration training more than balances rise in short-term training.	n.i.	**Small rise** in satisfaction with training.	n.i.	Employees only; excludes small workplaces (<5 people); matched survey delivers relatively low response rate for individuals, 19% in 2011.
NIACE Survey	("currently" and 3 year) **No long-term trend** in rate of current or 3-year	n.i.	n.i.	n.i.	Some info on barriers to learning,	Very broad concept of learning, not confined to work-related.

	participation in learning, 1996-2011.				but none on trends.	
National Adult Learner Survey (NALS)	(3 years) **Rises** by 6 percentage points 1997-2005, then **falls** by 11 percentage points, 2005-2010.	n.i.	n.i.	n.i.	n.i.	Severity of recent cut questionable; learning not confined to work-related.
Employers						
Employer Skills Surveys (ESS1)			Employers' real training investment per worker **falls** by 14.5%, 2005-2011. Down again in 2013.	**No change**, 2005-2013, in the proportion benefiting from certified training (12%).	n.i.	
Workplace Employment Relations Surveys (WERS)	(1 year) **Stability** in prevalence of off-the-job training establishments; 6% point **rise** in proportion of high-training establishments.	**Fall**, 2004-2011 in prevalence of establishments with average training times of 10 hours or more.	n.i.	n.i.	n.i.	Covers only non-managerial employees, in largest occupational group; participation depends on group; excludes small workplaces (<5 people).
Continuous Vocational Training Surveys (CVTS)	Small **rise** in company-level participation rate, 1999-2005, then large **fall** by 2010.	Ambiguous.	Expenditure on CVT courses per employee **falls** by 29.3%, 2005-2010.	n.i.	n.i.	The only company-level survey.

Notes: n.i. = no information.

a. Proportion of units participating in work-related training or education over a given period.

b. Total time engaged in training per worker (including both trainees and non-trainees).

c. The effectiveness with which the volume of training generates skills.

Table 2 Effect of Personal Characteristics on the Trend in Training Volume

	(Model 1)	(Model 2)	(Model 3)
Yrs 08-10 *(Ref: 95-97)*	-0.426**	-0.398**	-0.942**
Male		-0.0734**	-0.0343**
Level 3 education		0.338**	0.393**
Age (ref. <=30):			
Age 31-50		-1.206**	-1.614**
Age over 50		-1.516**	-2.061**
Interaction variables:			
Yrs08-10xMale			-0.0772**
Yrs08-10x Level 3 education			-0.0981**
Yrs08-10xAge 31-50			0.821**
Yrs08-10xAge over 50			1.036**
Constant	1.128**	1.910**	2.175**
Observations	338,408	338,408	338,408
R-squared	0.002	0.017	0.019

Note: Dependent variable is training hours. OLS regression estimates. Level 3 education means prior education is to A-level equivalent at least. ** means significant at 1%.

Source: QLFS; persons in employment.

Table 3a Conditional Effect of Industry on the Trend in Training Volume

Yrs08-10 *(Ref: 95-97)*	-0.848**	
	Ref: Agriculture in 95-97	*Interactions of the trend with industry*
Mining	0.339	
Manufacturing	0.0342	0.0579
Electricity gas & water supply	0.395*	-0.154
Construction	-0.115	0.205
Wholesale, retail & motor trade	0.396**	-0.156
Hotels & restaurants	0.970**	-0.549**
Transport, storage & communication	-0.0535	0.0969
Financial intermediation	0.0510	0.0419
Real estate, renting & business activity	0.293**	-0.100
Public administration & defence	0.781**	-0.0882
Education	0.413**	-0.0119
Health & social work	0.878**	-0.156
Other community, social & personal	0.627**	-0.197
CONTROLS	YES	
Constant	1.729**	
Observations	338,408	
R-squared	0.022	

Note: The effects are conditional on the controls that are used in Table 2, with model 2 including interactions of the controls with the trend. ** means significant at 1%.
Source: QLFS; persons in employment.

Table 3b Conditional Effect of Region on the Trend in Training Volume

Yrs08-10 *(Ref: 95-97)*		-0.673**
REGION	Ref: Tyne & Wear in 95-95	*Interaction: trend with region*
Rest Of Northern Region	0.0243	-0.302
South Yorkshire	0.240	-0.472**
West Yorkshire	0.0170	-0.329*
Rest Of Yorks & Humberside	0.0444	-0.355*
East Midlands	-0.0480	-0.292*
East Anglia	-0.0291	-0.281
Inner London	0.255*	-0.546**
Outer London	-0.0545	-0.270
Rest Of South East	-0.00719	-0.265
South West	0.0175	-0.158
West Midlands (Met County)	-0.0301	-0.286
Rest Of West Midlands	-0.0354	-0.322*
Greater Manchester	-0.196	-0.0295
Merseyside	-0.00530	-0.237
Rest Of North West	-0.0461	-0.251
Wales	0.125	-0.289
Strathclyde	0.0533	-0.112
Rest Of Scotland	0.0267	-0.219
Northern Ireland	-0.156	-0.385*
CONTROLS		YES
Constant		2.174**
Observations		338,408
R-squared		0.019

Note: The effects are conditional on the controls that are used in Table 2. ** means significant at 1%.
Source: QLFS; persons in employment.

Table 3c Conditional Effect of Occupation on the Trend in Training Volume

Yrs08-10 *(Ref: 95-97)*		-0.835**
OCCUPATION MAJOR GROUP	Ref: Managers, Directors & Senior Officials in 95-97	*Interaction: trend with occupation*
Professional	0.524**	-0.138*
Associate Professional And Technical	0.698**	-0.277**
Admin And Secretarial	0.0322	-0.0240
Skilled Trades	0.0762	-0.0191
Caring, Leisure And Other Service	0.784**	-0.348**
Sales And Customer Service	0.590**	-0.298**
Process, Plant And Machine Operatives	-0.271**	0.159*
Elementary	0.121*	-0.0447
CONTROLS		YES
Constant		1.886**
Observations		338,408
R-squared		0.022

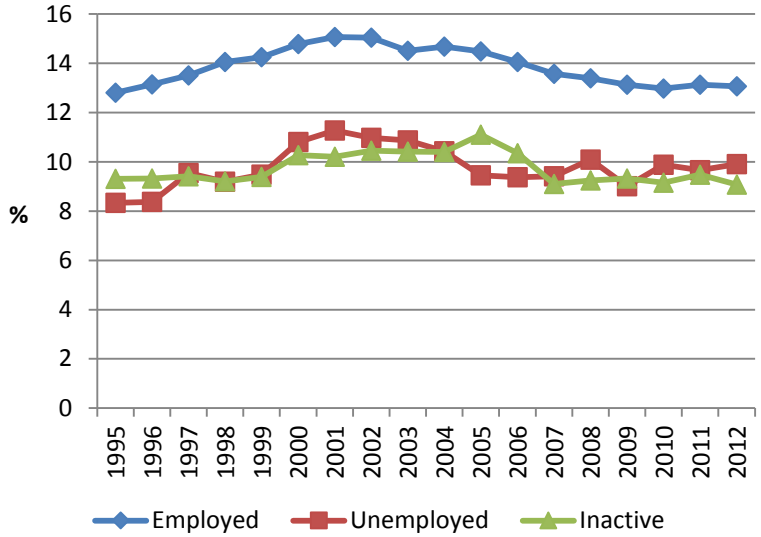
Note: The effects are conditional on the controls (including interactions) that are used in Table 2. ** means significant at 1%.
Source: QLFS; persons in employment.

Table 3d Conditional Effect of Occupation on the Trend in Training Volume

Yrs08-10 *(Ref: 95-97)*		-0.931**
		Interaction: trend with size
Large workplaces (>50 workers)	0.142**	-0.0138
CONTROLS		YES
Constant		2.113**
Observations		338,408
R-squared		0.019

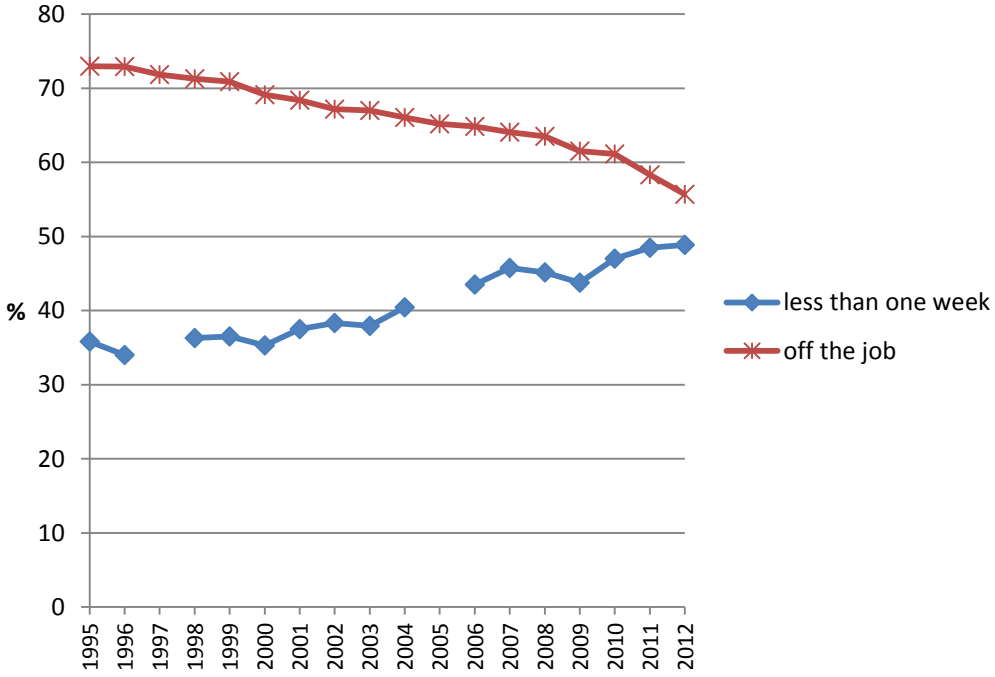
Note: The effects are conditional on the controls that are used in Table 2. ** means significant at 1%.
Source: QLFS; persons in employment.

Figure 1 Four-Week Training Participation Rate by Employment Status in the UK, 1995-2012



Source: QLFS. Age range 16-65.

Figure 2 Training Length[a] and Site[b] in the UK, 1995-2012.



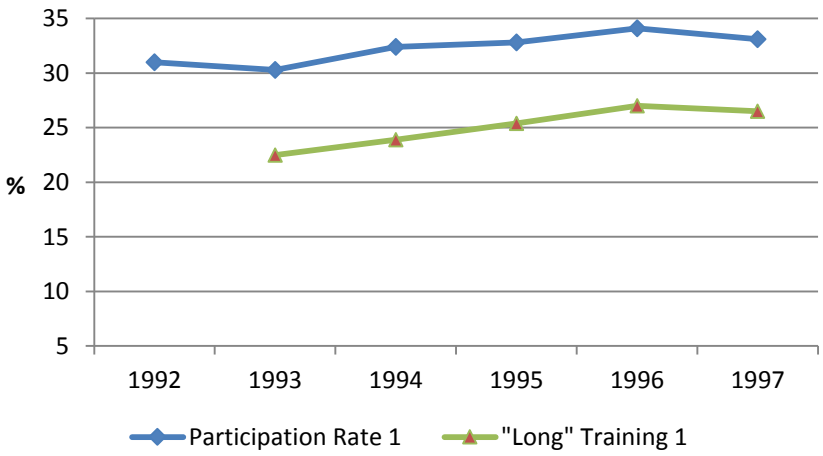
Source: QLFS (1st quarter). Persons in employment, age range 16-65.
a. Proportion of training episodes lasting less than one week.
b. Proportion undertaken partially or completely away from the job.
.

Figure 3 Training Volume Per Person in the UK, 1995-1998 & 2006-2010.
Hours training in previous week.

Source: QLFS, 2nd quarters. Persons in employment, age range 16-65.

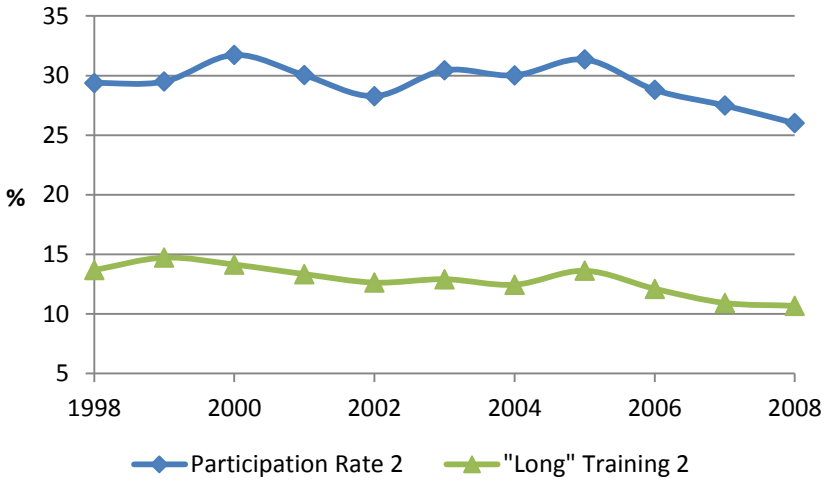
Figure 4. Annual Training Participation according to the British Household Panel Study.
Percent participation rate (since previous 1st September, approximately one year).

a) 1992-1997



"Long" training refers to participation in multiple training spells lasting in total more than 5 days in the year.

b) 1998-2008 (amended indicator)



"Long" training refers to participation in multiple training spells where the longest three lasted in total more than 5 days in the year.
Source: BHPS. All those in paid employment, over 16.

ENDNOTES

[1] We use the word "training" to refer to a wide variety of forms, including informal training, but we are aware that informal training will not always be well captured in survey data.
[2] Respondents need not have spent the whole day training to report some training in the day; hence, multiplying these averages by eight gives an upper bound for annual training hours. The very small proportion, 1.5%, who said they trained every day, were deemed to have had 225 days training.
[3] In these figures, the small proportion (0.1%) who reported more than 97 training hours, were coded as doing 97.
[4]Source: http://epp.eurostat.ec.europa.eu/portal/page/portal/education/data/database; consulted 20/8/2014. The quality of the UK CVTS data, especially for comparative purposes, has been questioned (CEDEFOP, 2010: 116).
[5] Calculated from Eurostat http://epp.eurostat.ec.europa.eu/portal/page/portal/education/data/database.