Skills alignment and 'matching' – easy to specify, hard to deliver?

Ewart Keep
Oxford University

Skills policy has for too long laboured under the false paradigm that education providers are responsible for providing oven-ready skilled labour to the workplace, that qualifications are a proxy for skills, and that the role of business is to submit timely requisition forms to get employees with the skills they need. This simplistic yet compelling narrative sets impossible expectations for everyone. Employers can be blamed for not clearly articulating the skills they need in a timely manner, awarding bodies and those responsible for setting standards for failing to properly translate skill needs into standards and qualifications, and 'providers' (a term I find particularly unhelpful) for a failure to follow the 'recipe' given them by the qualifications and/or a failure to deliver the skills needed.
(Michael Davis, former head of UKCES, 2015: 67–8)

INTRODUCTION

This paper represents the latest in a line of papers and think pieces that the author has prepared on this topic – for the UK government, the UK Skills and Productivity Board, and the Scottish Government and Scottish Funding Council – since 2014. It seeks to explain why trying to bring skills supply into closer alignment with demand for skills from employers is a much more demanding task than might at first be imagined, and that simple notions of getting supply to 'match' demand may produce policy goals that cannot be delivered.

The objective of seeking a closer alignment between the outputs of the education and training (E&T) system and the labour and skill needs of the economy is one that it is hard to object to. Better skills alignment is a public policy goal in almost all developed and indeed developing economies. However, accepting the goal is very different from delivering it, and the purpose of this paper is to stimulate reflection on the barriers that may stand in the way of making further progress and also to identify avenues for future policy development.

Alignment can be thought of in two main ways:
1. Adjusting the pattern of course provision to bring the output of the skills supply system more closely in line with demands from employers in the labour market (over a variety of time frames)
2. Adjusting the curricula and pedagogy of courses to ensure that they match the needs of employers and the labour market (now and the future).

Most of the attention tends to be focused on 1, but in many ways 2 is at least as important in the longer term, and neither are always as straightforward as might be imagined. 'Matching' skills supply with skills demand (what used to be called 'manpower planning') often sounds easy but experience past and present [see Smith and Bartholomew, 1988; Sinclair, 2004; Davis, 2015], in the UK and elsewhere suggests that it often is not. Problems of mis-alignment and of perceived skills shortages have been with us for a long time (see, for example, the 1980 Finniston Report on the engineering profession). Looking back across the history of UK skills policy we can see that at a number of points

new institutional arrangements, such as when in the early 2000s the Learning and Skills Council (LSC) and its 47 Local Learning and Skills Councils (LLSCs), were expected to deliver a revolutionary improvement in the alignment between demand and supply. On the whole this intended outcome was not achieved (Keep, 2002; 2012) and problems remain across the UK nations. The long-standing nature of some of these problems points to the difficulty of tackling them effectively.

It is also worth bearing in mind when reading what follows that the period we are currently entering looks set to deliver high levels of uncertainty within the labour market, as a result for example of:
- Brexit and changes in the flows of migrant labour
- The age profile of certain sections of the workforce and occupations, particularly in the skilled trades where an ageing workforce is often a major problem
- The move to net zero and the requirements for green skills
- Wider technological change and digitalisation, which is liable to change occupational, job structures and skill requirements in ways that are difficult to forecast
- New forms of work and employment (e.g. platform working, self-employment and the gig economy)
- Hybrid forms of working in the aftermath of Covid

Against this backdrop of change and turbulence, improving skills alignment in either of the two ways outlined above will be more rather than less challenging than it was in the past.

This paper argues that it is important to understand why difficulties with securing better alignment occur, as without this, constructing policy responses that will succeed is hard. Having explored why alignment is not always easy to contrive, the paper poses a set of questions about what more stakeholders can do to take the alignment agenda forward.

WHY SKILL ALIGNMENT IS NOT EASY
Technical or 'political' process?
It is important at the outset to underline the fact that although most of the literature on skills mismatches and alignment frames the issue as a technical one, it is also possible to see that in forming technical judgements political decisions (in the broad sense of that term) are also sometimes being made. For instance, a recent Scottish Enterprise and Skills Board (ESB) paper on the future noted that employers in the textile industry were bemoaning the fact that there was an apparent surfeit of graduates in textiles design and too few young people wanting to take up factory floor operative positions. Perhaps, the paper suggested, young people needed to be encouraged to ignore degrees and enter entry level operative positions? At one level this might sound like an easy win, but there are potential ramifications for other aspects of policy – for example, social mobility and access to higher education, depending upon which potential students were re-directed away from study in HE towards destinations associated with a lower socio-economic status. It is also not clear just how simple or politically acceptable this goal would be to deliver.

More generally, whichever body or set of bodies/agencies are deemed responsible for achieving better alignment will find themselves trying to square a triangle of competing and not always congruent demands and aspirations from:

- employers;
- individuals (who are potential learners/students);
- and from the state (e.g. in the form of participation and access targets),

and to be doing this at a range of levels – national, local, sectoral, occupational and course and provider institution (Keep, 2002). This mediation role will sometimes go beyond the technical and

will require judgements on a range of political issues and trade-offs between competing interests and goals.

What does supply/demand 'alignment' mean?
Simplistic versions of the first type of skills matching or alignment policy (matching educational output to meet employer demand) implicitly adopt the notion that the volume of supply of students with particular skills that are exiting the E&T system at any given time should be similar to the current number of job vacancies that exist for that skill at national and probably also local levels. This model has the appeal of simplicity, but it is extremely hard to contrive and is often not what employers actual desire.

In the first instance this is because few employers want a single applicant for their job opening, they normally prefer a field of candidates from which to choose. Furthermore, basic economic theory tells us that it is economically rational for firms to over-estimate their demand, particularly when the skills being created are being paid for by either the student or the taxpayer (rather than directly by firms), as a surfeit of skilled individuals will tend to reduce upward pressure on wages (Keep, 2012). Employers will also realise that in many instances not every student who has studied subject X will necessarily want to pursue occupation Y as a result (see below for further details) and therefore there exist strong reasons why in many instances employers will ask for more than they need.

As well as course choice, alignment also means course adjustment and re-design to accommodate new and changing skill and knowledge requirements. This aspect of the problem often gets forgotten in the sometimes-heated discussion about matching the volume of study with employer demand.

Different businesses have divergent needs
A second and very important challenge is that employers do not represent a homogeneous category. Firms' skill needs, and their recruitment and selection expectations and policies will vary by, for example, size, sector, production technology, ownership structure, country of origin, and competitive strategy. Moreover, people within the same firm may have widely divergent views about skill requirements and what they mean. Thus, the human resource managers' conceptualisation of skill needs may not match those of the CEO, or individual members of the senior management team, or those of the line managers into whose function/workplace new workers will be entering (Gleeson and Keep, 2004).

As a result, obtaining and then acting upon the views and needs of industry is not as straightforward a task as some imagine (Gleeson and Keep, 2004; Keep, 2012), as two UK government reviews of HE provision (the Wakeham Review of STEM (2016) and the Shadbolt Review of Computer Sciences (2016)) demonstrated. Put simply, different employers sometimes want very different learning outcomes from the same educational course. Thus the Shadbolt Review noted that:

> a clear challenge is that employers are often divided on where the problem lies. . .
> we found that employers disagree on what technical skills Computer Sciences students should be taught, although the balance of evidence points to support for HE providers teaching the fundamental principles of Computer Science, and encouraging and enabling students to learn and adapt to new technologies over their careers. This runs counter to an opposing school of thought that has been evident from some employers, that suggests that they want graduates with the skills that reflect the most up to date technological trends.
> (Shadbolt 2016: 5)

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The Review went on to observe that, 'in addition to variations across industrial sectors and types of role, the needs of start-ups and SMEs should be taken into account as much as the requirements of large organisations' (Shadbolt, 2016: 6), and it is certainly the case that in some sectors in England there have been complaints from smaller employers that the Trailblazer groups that have established the apprenticeship standards for their sector have been dominated by larger employers and that the apprenticeship design that has resulted has not met the needs of SMEs.

At a broader level, the gap in terms of work organisation, job design and skill requirements between leading and trailing edge firms can often be substantial, and we know that one of our problems in the UK is a 'long tail' of low performing firms whose ambitions for skills may fall below what the economy and society need in the longer term. This points to the importance of having relatively strong and capable sectoral bodies that can 'mediate' between competing demands and provide a mechanism for helping reconcile different needs and goals and achieving a broad consensus around specifying the 'skill quality' of demand.

A zero-sum game?
We also need to acknowledge that in some instances firms, sectors and those who 'own' occupations (e.g. professional bodies) believe themselves to be locked in competition with one another in what has been called a 'war for talent'. Given that this war is usually defined as a form of zero-sum game competition over a finite pool of gifted/talented/desirable individuals, the most likely outcome is that some employers and sectors will be relative losers and others will be winners. The losers may not be happy about the resultant outcomes and finding the means to keep everyone happy can be hard, perhaps sometimes impossible. As a result, the 'skills system' will, in the eyes of some employers, be failing to meet their needs.

Not everyone will be 'employed'
It is also the case that about five million (or more than one in seven) of the UK's workforce are now self-employed (i.e. there are more people self-employed than there are in the whole of the public sector workforce). This kind of employment is particularly prevalent in some sectors (construction, media, creative) where project-based work and freelancers are often the norm. Therefore, when we think about employers, we need to remember that a significant proportion of workers are their own employer and that what they want matters. It also suggests that courses that cater to sectors/occupations where self-employment is important need to be help develop the skills, knowledge and attributes that can help people make a success of self-employment.

The temporal dimension and employers' ability to deliver timely LMI
The nature of educational process means that in many instances there are significant lead times involved in expanding provision in any given subject area. An undergraduate degree takes three or four years to complete, and new courses require design, approval and student recruitment to take place before any learning can start. It is also the case that changing the relative mix/scale of educational provision between subjects and levels is dependent upon ensuring that patterns of student course choice can be re-aligned and re-focused (see below).

The issue is that in the UK most employers do not undertake any long-term workforce planning (the NHS would be a partial exception) and therefore they are often unable to provide information on future skill needs sufficiently far in advance of the need becoming manifest for E&T providers to be able to respond effectively (Green et al, 2017; Wakeham Review, 2016: 4-5). In effect, what we often have is a spot (labour) market in which the lead times for some of the educational outputs in demand are relatively lengthy. This means that rapid responses may need to be focused (at least in the first instance) on those forms of provision that have shorter inherent lead times - Masters-level

provision and short courses. For example, in England, DfE are experimenting with short, intensive 12-week adult re-skilling bootcamps, and in Scotland the Flexible Workforce Development Fund (FWDF) offers opportunities for relatively swift responses to urgent training needs. In turn, this underscores the importance of developing a robust and serviceable micro-credential system to support adult re- and upskilling in the longer term.

Flows out of education into the labour market
Finally, most of the focus on skills alignment (in the UK and elsewhere) tends to alight upon initial forms of E&T provision and therefore young school, college and university leavers. However, this focus is problematic, because across the UK, <u>in any given year the total number of young labour market entrants from schools, colleges and universities is equal to between two to two and a half per cent of the existing workforce</u>. This means that if labour and/or skill shortages are extensive then even if instant re-alignment within the initial education system were possible it might not be able to fully meet demand in the short to medium-term. This underlines the importance of the point made above about the need to think carefully about the role of adult re and upskilling in meeting skill needs, not least because many job openings require experience and can only be filled from within the existing adult workforce.

THINKING ABOUT THE TALENT PIPELINE
With the above caveats in mind, what can we say about the process of student decision making and choice that underlies many of the concerns about how best to align skills supply with demand? The problems with flow through what is sometimes called the talent pipeline occur at three stages:

1. **Choice of subject/course needed to access a particular occupation/sector.**

Student choice is of critical importance, as running new courses that no one will want to pursue or expanding existing provision without sufficient student demand will waste scarce resources and achieve little. There are a number of issues that could be discussed under this heading, but for the sake of brevity, two of the most important will be considered here. First, choices made early on in individuals' educational journeys can often materially impact on the range of subsequent choices that they can make. In England, failing to choose science subjects at A level normally makes it very hard to subsequently access degree-level courses in subjects like Physics, Chemistry, Medicine, etc. In other words, in some instances early course/subject choice produces bottlenecks that can induce a degree of path dependency in terms of subsequent course and potentially occupational choice. This speaks to the need for high quality CIAG to be available relatively early on in an individual's learner journey.

Second, the fact needs to be borne in mind that some sectors, occupations and jobs are likely to be seen by some individuals as being less attractive than others, for reasons of pay, conditions, working hours, and social status. It is often unclear what education can do to change these perceptions of relative attractiveness, although some sectors and employers have expended considerable effort on industry/education liaison activities and promotional materials aimed at changing perceptions. How effective such interventions are is unknown, but some sectors and occupations have consistently and persistently proved less attractive than others (e.g. some hospitality and catering jobs), and the long-term solution may rest with improving pay and working conditions rather than anything that happens inside initial education and training.

2. **Occupational/sectoral choice after initial education and training is complete.**

Models of matching supply with demand often assume that there is a direct line of sight between choice of subject of study and a relatively well-defined set of job openings that can be accessed as a result of that course of study. As both the Wakeham and Shadbolt Reviews noted, the reality of modern-day labour markets, in part being shaped by extremely rapid technological change, is one of

occupational fluidity, complexity, and often very fragmented career pathways and choices. Thus, simple linear pathways from a particular academic discipline to specific categories of employment are often absent (the example of physics is used by Wakeham, 2016).

Moreover, in countries (like the UK nations) that do not possess a strong conceptualisation of occupation and associated occupational skills sets (see Brockmann et al. 2011; Fuller and Unwin 2013), studying for a qualification associated with a particular occupation does not mean that this will necessarily be the occupation that the individual enters. For example, research undertaken by the Centre on Skills, Knowledge and Organisational Performance (SKOPE) demonstrated that in the UK there is a significant 'leakage' (between university and subsequent employment destination) of engineering graduates and even those who studied for specialist masters in particular strands of engineering. Less than half of all graduates from particular engineering sub-disciplines (e.g. marine, automotive) go into the apparently corresponding industry and the figures are not much better at master's level (Dixon, 2015, 2017). Generally less than 50 per cent go into any kind of manufacturing. Similarly, in law and legal studies, many universities see as few as 20–30 per cent of their students go on to enter employment in the legal sector (Grey 2018).

This reality is reflected in work by the OECD (Montt, 2015) and by Arnold et al. (2018), which demonstrates that in labour markets like the UK or Canada, which lack extensive Licence to Practice (LtP) regulation, and where the hold that qualifications have on employers' recruitment and selection decisions is at best 'fuzzy', matching is a deeply problematic concept and expectation. Interestingly, Montt argues that trying to match student subject choice to subsequent employment is not worth pursuing; in part because it causes problems for student career changes that have significant social and economic costs (Montt, 2015). It is worth remembering that in 2016, 82 per cent of the graduate training schemes advertised by members of the Institute of Student Employers (the grouping that represents larger, UK blue chip graduate recruiters) were open to students from any discipline (Grey, 2018).

It is also the case that conventional economics suggests that (anticipated) wages are a rational resource allocation mechanism, as the most able/productive people will normally choose to enter those occupations and work for those employers who pay the highest wages, and wages are deemed by economists to be a good proxy for productivity. Thus, many economists would argue that the 'loss' of some of our brightest engineering graduates to investment banking is both a rational and beneficial (in the round) outcome. Leaving aside whether one accepts this argument, the problem for public policy makers is that the 'losers' (in this instance engineering employers) often do not see it like that and tend to complain that they are not getting their fair share of the brightest and best. It is not clear what the appropriate public policy response to this challenge is. Simply expanding engineering provision may make a limited difference if a significant proportion of engineering students continue to opt for careers in sectors other than engineering.

3. **Wastage/attrition once in employment.**

Following on from the above, simply because a labour market entrant makes an initial choice of occupation and employer, this does not always mean that they are 'locked in' to a career in that sector for the long-term. As discussed above, in a labour market where extensive licence to practice regulation is absent, individuals often have considerable freedom in terms of what jobs they can seek to access and in the UK labour market career choice following initial education is, at aggregate level, quite fluid. The Wolf Review noted:

> In the cohort born in 1991, 62% of employed young people changed sector
> in the one year interval between age 17/18 and 18/19. About 40% also
> changed their broad occupational level. Taking an 11-year period (1998-2008),

> an analysis of those in their 20s and early 30s who remained in employment
> throughout showed that the average such individual changed jobs 3.5 times,
> changed occupations 2.5 times and changed sector 1.8 times.
> (Wolf 2011: 37)

This suggests that obsessing about ensuring a close match between course studied and first or early job destinations after leaving initial education may be of limited utility.

A second consideration is that there are a number of professions and occupations where we know that labour shortages in part (sometimes a growing proportion) spring not from a shortage of individuals qualified to undertake the work, but from the fact that those that are qualified and have entered the workforce are now choosing to leave the occupation because individuals are concluding that the pay and/or working conditions and stress levels are unacceptable (e.g. HGV driving, nursing, social care, teaching, etc). In these circumstances, the E&T system finds itself in effect trying to fill a leaky bucket. Rather than boost the supply of people being readied to be 'poured' into the occupation, a more effective solution might be to mend the bucket so that it leaks a lot slower.

This chimes with the findings from the Australian Skill Ecosystems projects (which the author of this paper was involved with in the mid- to late 2000s). The projects were run in several Australian states and were targeted at addressing persistent skills shortages in sectors such as dairy farming, construction, social care, etc. One of the main conclusions reached when these problems were researched and analysed as the first stage of a policy process was that much of what were being labelled as skills shortages were in fact simply the symptoms of poor people management practices and reliance on an unsustainable model of recruitment, selection and employment (see Eddington and Toner, 2012; and Buchanan, Anderson and Power, 2017).

AVENUES FOR PROGRESS
A choice of basic models for interaction between education and business
In the UK there exist two arguably incommensurable models for structuring education-business interactions. In the first, the employer is viewed as a customer (more or less demanding, but detached from the actual process of skill production) within a marketized, one-way street, relationship with a range of suppliers. This approach partially underpins current English policy and has found its latest expression in the Local Skills Improvement Plans (LSIPs), whereby local chambers of commerce will undertake a survey of skill needs and then communicate these to their local education providers. Providers will need to demonstrate that they have given due consideration to the priorities identified in the LSIP or face penalties from government. Colleges will be able to bid to a national fund to help them re-align their offer in support of skill needs identified in the LSIP. As they stand, LSIPs require nothing from employers beyond identifying a 'wish list'.

In the second model, the employer is seen as an integral partner or co-producer within the skill formation process or system (Samuel et al. 2018) and works alongside and within the E&T system to help develop some of the skills it needs (not least through high quality work experience, but also through expanding apprenticeship provision and increasing investment in adult training). The Wakeham Review made this point very clearly: 'greater collaboration between business and HE is vital to ensuring appropriately educated and skilled graduates. The implied partnership endows each partner with responsibilities that should be explicitly accepted. The importance of this partnership is not a new revelation' (2016: 1). It is the author of this paper's view that partnership and co-production will almost certainly get us a lot further than 'employer as detached customer' will.

Alignment in a fast-changing world

This choice of model will be particularly important as many commentators argue, as noted above, that we are entering a period of considerable change in the economy and labour market engendered by moves to Net Zero, by digitalisation and by adjustments attendant upon the impacts of Brexit. These forces for change are in turn driving the adoption of new business models, new organisational structures, employment and career patterns, and work organisation and job design. All of these will impact on the shape and level of demand for skills and knowledge. This leads to two challenges:

1. The first is to find adequate means to monitor and interpret the implications of altering patters of skill demand (from businesses, individuals and wider society).
2. The second is then to respond to that changing demand through changing patterns of provision, new courses and new and updated qualifications

If we do not get our response to the first challenge right, then we will almost certainly struggle to adequately address the second. For example, quite detailed and granular knowledge concerning the changing pattern of jobs and skill requirements in the workplace is needed in order to re-design courses and qualifications to reflect changing need within occupations and workplaces.

Pathways to progress
Making headway on the alignment issue arguably requires a number of understandings:

1. That detailed, timely and accurate information will be required as the bedrock for formulating plans for action. This covers skills foresight exercises, employers' assessments of skill needs, other conventional sources of LMI, analysis of online job advertisements and further particulars (see the work of Nesta on this), and workplace studies of changing work organisation and skill usage.
2. That alignment requires cooperation (and in many instances co-production) between a range of bodies, not least in relation to making sure qualifications are up to date.
3. Better alignment also requires close communication, cooperation and co-production between education and training providers and employers, and institutional mechanisms to facilitate this.
4. That alignment sometimes requires the mediation of competing demands and the allocation of scarce resources between those interests.
5. That the timescales involved in higher levels of initial E&T are relatively lengthy and that therefore 'agility' is not always going to be easy to deliver.
6. That changing the structure/shape of the provision offer at national and local levels is dependent upon changing the long-term structure of student demand and subject choice.

The current set of Tertiary Provision Pathfinders being undertaken in Scotland may offer a way forward in terms of providing a model for how college and university provision in a locality/region can be better aligned to employer need and also in terms of finding ways to influence patterns of student demand. The progress of the Welsh Government's Regional Skills Partnerships and the evolution of the LSIPs in England may also furnish pointers towards how a sectoral model can better shape local patterns of provision.

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