

Department for Business, Energy and Industrial Strategy

Green Paper: Building Our Industrial Strategy

NFER Response

Overview

The NFER welcomes the Government's commitment to a comprehensive industrial strategy. We particularly welcome the pledge to address the structural and institutional changes necessary to address skills shortages in vital STEM subjects, the vow to tackle the wide regional variations in access to high-quality basic and vocational skills and the recognition of the importance of the needs of the half of young people who do not go to university.

Question Responses

3. Are the right central government and local institutions in place to deliver an effective industrial strategy? If not, how should they be reformed? Are the types of measures to strengthen local institutions set out here and below the right ones?

The consultation rightly highlights the regional gaps in skills and education levels across England. A place at a good school for all is the most effective way to address the shortfall in basic skills for children of school age. In line with other research (e.g. [The Annual Report of Her Majesty's Chief Inspector of Education, Children's Services and Skills 2015/16](#)), NFER analysis shows that whilst nationally the proportion of good schools in England is high, there is a very high degree of variability in the numbers of underperforming schools across regions ([Hillary, J., Bamford, S., Bernardinelli, D. and Gee, G. \(2017\). A Tale of Eight Regions. Part 2: Challenge and Support Across the Regional Schools Commissioner Areas. Slough: NFER](#))

Key to ensuring that schools play an effective role in the strategy is making sure that they are appropriately staffed. There are differences in the number of teachers entering and leaving the workforce between primary and secondary schools, with secondary schools disproportionately affected. While the number of qualified teachers (full-time equivalent) in English state primary schools has increased by 13 per cent since 2010, the number in secondary schools has declined by six per cent. The increase in primary teachers mirrors a similar increase in primary pupil numbers over the past six years. In secondary schools, pupil numbers are starting to increase, having fallen over the past decade. So the pressure is now on secondary teacher numbers to increase as well.

Within secondary, science teachers are a particular 'at risk' group. The recent (2016) Migration Advisory Committee review of teachers concluded that 'secondary school teachers in maths, physics and chemistry are presently included on the Shortage Occupation List (SOL). They found that teachers in maths and physics met our shortage and sensible methodological test but that there was not sufficient evidence of a shortage of chemistry teachers.' ([Migration Advisory Committee \(2016\). Partial review of the Shortage Occupation List: Review of](#)

[teachers](#)). NFER has also conducted research into intent to leave and found a specific and unusual trend for science teachers. Science teachers are significantly more likely to be considering leaving teaching than secondary non-EBacc subject teachers, after accounting for their relatively high level of engagement. This suggests that their levels of engagement are acting as a protective factor, but there are other underlying factors that affect the retention of science teachers over and above how engaged they are with teaching. This may be related to their specific skills being highly valued in the labour market outside of teaching ([Lynch, S., Worth, J., Bamford, S. and Wespieser, K. \(2016\). Engaging Teachers: NFER Analysis of Teacher Retention. Slough: NFER](#)).

There are also important regional differences in teacher turnover and retention. Department for Education (DfE) analysis shows that schools in areas with a high level of deprivation had slightly higher rates of school-to-school mobility and wastage. Within these higher deprived areas, those that were inland urban areas had the highest rate of leavers to other schools, and those that were coastal rural areas had the highest rate of teachers leaving the sector entirely. Urban schools in general recruited a higher number of newly qualified teachers (NQTs). Further research is needed to understand the underlying reasons for these differences ([Schools workforce in England 2010 to 2015: trends and geographical comparisons, DfE, 2016](#)).

8. How can we best support the next generation of research leaders and entrepreneurs?

NFER believes that it is vital to support high quality research organisations (whether HEIs or independent organisations) to continue to conduct research into all aspects of education, to ensure there is a sound evidence base on “what works”, and what is most cost effective, in securing the right skills to support the Industrial Strategy.

10. What more can we do to improve basic skills? How can we make a success of the new transition year? Should we change the way that those resitting basic qualifications study, to focus more on basic skills excellence?

To be successful the new transition year needs to ensure all stakeholders fully understand its purpose, be situated within a system of improved careers advice and guidance, and be supported by parents and teachers’.

Communicating the purpose of the transition year

Considerable effort needs to be made to ensure that all stakeholders fully understand the purpose of the transition year *before* its introduction. A positive narrative needs to be developed that presents the opportunity the transition year offers in order to prevent damage to young people’s self-confidence and resilience. Consideration should be given to the location of where young people will study during the transition year as this is not currently clear and it will be important to clarify this *before* the introduction as the possible perception that young people will have to spend another year *at school* could be damaging. Many young people will need to move on from school to an environment such as a further education college where they can be treated as adults but with appropriate levels of additional support where needed.

Careers advice and guidance

Current knowledge and awareness of the world of work, routes to progress to work and contemporary work practices needs to be enhanced amongst young people at key stages 3 and 4, their parents and subject teachers. A survey of parents of teenagers commissioned by the Edge Foundation shows that parents' knowledge of non-academic qualifications is increasing, but overall parents still know more about academic qualifications. In addition, there has been so much recent change to 14 to 19 educational routes, and a growing emphasis on the skills needed for the world of work, that many parents and teachers are not up to date with current and local education alternatives and employment opportunities ([McCrone, T. \(2014\). Changing Attitudes to Vocational Education \(NFER Thinks: What the Evidence Tells Us\). Slough: NFER](#)).

Our work on what constitutes effective careers guidance underlines the importance of young people and parents/carers having access to good information about the options available. High quality careers provision should include a focus on first laying the foundations with careers education before young people can benefit from subsequent careers information, advice and guidance and make informed decisions about courses and qualifications relevant to their chosen career pathways ([McCrone, T. \(2013\). Careers Guidance: If Not an Annual Careers Plan - Then What? \(NFER Thinks: What the Evidence Tells Us\). Slough: NFER](#)).

Schools, colleges and employers, including corporate, small and medium-sized enterprises and micro-businesses need to engage with each other to provide young people with information on academic and vocational routes to employment.

Parental and teachers' influence

Parents and teachers need a greater awareness and understanding of current vocational qualifications and routes to employment. Seventy per cent of young people turn to parents and 57 per cent to teachers for careers advice (Freshminds, 2014 cited in McCrone, T. (2014). Changing Attitudes to Vocational Education ([NFER Thinks: What the Evidence Tells Us](#)). Slough: NFER). The introduction of an integrated application system for vocational and academic qualifications similar to that currently used for university entrance would help support this.

All young people need to experience **work placements** so that they are more aware of the world of work, yet when secondary senior leaders were asked what proportion of their pupils had undertaken a work placement lasting two weeks or more nearly half (42 per cent) of respondents said no pupils experienced a work placement lasting two weeks or more' (NFER Teacher Voice Omnibus January 2017 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/584503/Teacher_Voice_Summer_2016_Report_Final.pdf).

Parental influence is also an important consideration. Research has shown that among parents who offer advice or help about career options, there is a strong tendency to use their own knowledge and experience (84 per cent) or the knowledge and experience of family members and friends (66 per cent), a potentially limiting factor in terms of social mobility (Omnibus survey of pupils and their parents/carers January 2017 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/584555/DfE_PC_Omnibus_Wave_1_Report_FINAL_January2017.pdf).

Content of the Transition year

As well as further study of basic skills, we suggest – based on our research examining the impact of school-based programmes that are in place to support students aged 14-16 who are at risk of temporary disconnection from learning ([McCrone, T. and Bamford, S. \(2016\). NEET Prevention: Keeping Students Engaged at Key Stage 4. Slough: NFER](#)) – inclusion of the following content within the transition year: one-to-one mentoring; group support such as sessions involving peer support; connecting basic skills to the world of work; flexibility in terms of the location of study and the programme of study and providing young people with a consistent, dedicated member of staff who has the time and resources to support them.

11. Do you agree with the different elements of the vision for the new technical education system set out here? Are there further lessons from other countries' systems?

Do you agree with the different elements of the vision for the new technical education system set out here?

An NFER review of technical education in 2015 found limited literature referring specifically to technical education, which is an under-researched area of education provision. Technical education is not generally defined as a separate entity as distinct from vocational education. The evidence highlights that the characteristics of vocational education include not only those associated with all learning (such as supportive teacher/learner relationships and having a culture of aspiration), but also the distinctive, additional features of meeting the diversity of vocational learners' needs and contextualisation of learning. Contextualisation, relevant also to technical education, includes the importance of relevance to the workplace sector, access to industry-standard facilities and resources, drawing on teachers' dual professionalism, teachers place in a community of practice, links with employers and the sequencing of experiences ([McCrone, T., O'Beirne, C., Sims, D. and Taylor, A. \(2015\). A Review of Technical Education. Slough: NFER](#)).

Are there further lessons from other countries' systems?

Engaging children and young people sufficiently with STEM, and helping them do well at younger ages, are crucial pre-requisites for a successful post-16 system of technical and professional education. NFER analysis of the characteristics of countries that teach science found that high performing countries tend to teach science as a separate subject in primary education ([Burdett, N., Burge, B., Kathrecha, P. and Sargent, C. \(2015\). Exploring the Characteristics of Education Systems which are Successful in Science. Slough: NFER](#)). The analysis – based on data from the Trends in International Mathematics and Science Study (TIMSS) 2011, and from the TIMSS encyclopaedia – recommends raising the profile of science by separating it out more within the subject area 'the world around us', or possibly looking at the Dutch approach to science within the 'personal and world orientation' subject area. Policy makers would need to review the extent of curriculum changes, and the impact on teachers and any teacher specialisation required, before deciding whether separating out science more within the curriculum would be feasible.

12. How can we make the application process for further education colleges and apprenticeships clearer and simpler, drawing lessons from the higher education sector?

The introduction of an integrated application system for vocational and academic qualifications similar to that currently used for university entrance is likely to support greater awareness and understanding of current vocational qualifications and routes to employment but more evidence needs to be collected to support this.

13. What skills shortages do we have or expect to have, in particular sectors or local areas, and how can we link the skills needs of industry to skills provision by educational institutions in local areas?

What skills shortages do we have or expect to have, in particular sectors or local areas?

Skills shortages in STEM sectors are considered to represent a real threat to the UK's capacity for growth. From NFER's extensive body of research on STEM subjects since the Roberts Review in 2002, there are several consistent messages that emerge from the evidence on the most beneficial features of activities and interventions in schools that improve young people's engagement in STEM:

- Engage pupils at an early age and at key transition points
- Focus teaching on practical activities, set in real-life contexts and offer good quality enrichment and enhancement activities
- Link teaching to careers in STEM
- Make clear links across and between the STEM subjects
- Support teachers with professional development with a focus on practical activities and real-life and current examples ([Straw, S. and MacLeod, S. \(2013\). Improving Young People's Engagement with Science, Technology, Engineering and Mathematics \(STEM\) \(NFER Thinks: What the Evidence Tells Us. Slough: NFER\).](#))

How can we link the skills needs of industry to skills provision by educational institutions in local areas?

An existing approach that links the skills needs of industry to skills provision by educational institutions in local areas are university technical colleges (UTCs). NFER recommends that the strengths and weaknesses of this approach be reviewed with a view to informing future industrial strategy.

Forthcoming [NFER analysis of UTCs](#) reveals that the most effective and successful UTCs have a subject specialism very closely aligned with local area and the employer sponsors or at least one large well known employer in the local area (e.g. Silverstone UTC, JCB Academy, UTC Reading). Our analysis looks at the characteristics and outcomes of students who attend UTCs and finds that:

- UTCs are increasingly effective at attracting young people with average prior attainment who are similar to their peers who did not attend UTCs in regards to special educational needs (SEN), pupils eligible for free school meals (FSM) and young people high on the income deprivation affecting children index (IDACI).
- When compared with matched comparison schools, students at UTCs perform better in science at key stage 4 (which many UTCs specialise in) and equally well in maths.

- UTCs do not score highly on Attainment 8 compared to other schools. This is due, in part to their remit of combining both academic and technical education which results in them not offering students enough qualifications to fulfil the requirements of Attainment 8. Attainment 8 may not be the most appropriate outcome measure for UTCs.

Local commissioning of provision

In addition, **local commissioning of provision** needs to be more effective. Research by NFER for the Local Government Association (LGA) in 2013 found that whilst many councils in England (53 per cent) report that the commissioning process for local 16-19 education and training provision is effective, a majority believed that the Education Funding Agency (EFA) is restricted in the extent to which it is responsive to local need and that their council does not have sufficient influence over their EFA funding allocation and find it difficult to change the commissioning of local provision ([Kettlewell, K., Sims, D., O'Beirne, C. and Gee, G. \(2013\) Councils' Views on the Effectiveness of the 16–19 Commissioning Process \(LGA Research Report\). Slough: NFER](#)). Recommendations from the research include:

- The roles and responsibilities of all stakeholders in determining need and commissioning and delivering provision should be made very clear.
- Commissioners should take into account young people's views about what learning and training offers should be provided.
- There should be more transparency regarding the provision local providers are commissioned to deliver. This would enable councils to support providers to shape, promote and deliver the courses and programmes that have been commissioned.
- There should be greater flexibility in national funding rules to enable local discretion to meet local needs, particularly for young people who need support to help them engage in local provision. This is especially important for vulnerable groups and for effective commissioning of provision for young people outside the mainstream of sixth form and college courses (ibid).

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