Department for Education

Design and technology GCSE subject content: equality analysis

November 2015

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1. Introduction

This document assesses the equalities impact of new subject content for GCSE design and technology. Impact is assessed by reference to the protected characteristics of pupils or students. Section 149 of the Equality Act 2010 requires the Secretary of State, when exercising functions, to have due regard to the need:

- to eliminate unlawful discrimination, harassment and victimisation and other conduct prohibited by the Act
- to advance equality of opportunity between people who share a protected characteristic and those who do not and
- to foster good relations between people who share a protected characteristic and those who do not

The relevant protected characteristics are disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex and sexual orientation. Age is not a relevant protected characteristic in relation to schools.

Pupils with Special Educational Needs (SEN), pupils eligible for Free School Meals (FSM), pupils with English as an Additional Language (EAL), and looked after children are not groups covered specifically by the Equality Act (although pupils within those groups may otherwise share a protected characteristic), but have been included in this analysis wherever possible. This is because those groups can be over-represented among low attaining pupils and we are keen to ensure the difficulties they face are not unnecessarily compounded by qualification reforms. They have not been included as a proxy for those students with protected characteristics.

2. Engagement and involvement

The public consultation opened on 1 July 2015 and closed on 26 August. We received 382 responses from a range of stakeholders, including schools, subject groups and awarding organisations.

The department has led on developing content for design and technology, using expert drafters and working closely with Awarding Organisations, Ofqual and subject experts, to establish what changes were needed to make sure the new qualification is robust and rigorous. Subject experts included:

The Design and Technology Association (DATA); the Sir James Dyson Foundation; the Textiles Institute; the Design Council; the Royal Academy of Engineering; Higher Education Institutions; and design and technology teachers.

3. Description of the policy

The government is reforming GCSEs and A levels to ensure that they prepare students better for further and higher education, and employment. GCSEs are being reformed so that they set expectations which match those of the highest performing countries, with rigorous assessment that provides a reliable measure of students' achievement.

Reformed GCSEs will be respected qualifications in which students, employers and further and higher education institutions can have full confidence. They will provide students with more fulfilling and demanding courses of study. GCSEs will continue to be universal qualifications, entered by the same proportion of students as currently.

The new A levels will be linear qualifications that make sure students develop the knowledge and skills needed for progression to undergraduate study.

Reforms to these qualifications are already underway. GCSE subject content in English literature, English language and mathematics was published in November 2013, and the new qualifications are being taught from September 2015. GCSE subject content in ancient languages, geography, history, modern foreign languages, biology, chemistry and physics, which will be taught from September 2016, was published in April 2014. GCSE content in computer science, dance, music and physical education was published January 2015. These new qualifications will also be taught from September 2016.

At AS and A level, subject content in art and design, biology, business, chemistry, computer science, economics, English language, English literature, English language and literature, history, physics, psychology, and sociology was published in April 2014. These new qualifications are being taught from September 2015. AS and A level subject content in modern foreign languages, ancient languages, mathematics, further mathematics, geography, dance, music and physical education was published in January 2015. These new qualifications will be taught from September 2016.

Design and technology GCSE will be first taught from 2017. We are currently consulting on a further range of GCSE and A level subject content, also for first teaching in 2017.

GCSE and A level reforms are not being introduced in isolation. Reforms across the education system will benefit all pupils and lead to improvements in teaching so that pupil performance will rise to meet the new higher standard. Many policies, for example the introduction of the Pupil Premium, SEN reforms, and the expansion of the academies programme, have a particular focus on those pupils left behind currently. A summary of DfE's programmes to support teaching for pupils with SEN is set out at Annex A.

4. Evidence base

Our analysis of the potential impact of the proposed GCSE in design and technology has been informed by:

- meetings with employers, stakeholders, subject associations and awarding organisations.

- a review of relevant literature, as referenced throughout the equality impact assessment

- responses to our GCSE subject content consultation. DfE asked the following questions in the consultation on the GCSE and A level subjects under analysis here:

    - Do you think that the proposals have the potential to have a disproportionate impact, positive or negative, on specific students, in particular those with 'relevant protected characteristics'? (The relevant protected characteristics are disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex and sexual orientation.) Please provide evidence to support your response
    - How could any adverse impact be reduced and how could the subject content of the GCSE be altered to better advance equality of opportunity between persons who share a protected characteristic and those who do not share it? Please provide evidence to support your response

- Responses to the consultation which opened on 25 September 2014, and which included an earlier version of design and technology GCSE content. This consultation included the same questions as above

5. Evidence review

The following summary draws on evidence in relevant literature, responses to the public consultation on the GCSE content, and views expressed by stakeholders in face-to-face meetings in developing subject content.

In total, 175 respondents to the public consultation answered the question about potential disproportionate impact on students with relevant protected characteristics (from 382 respondents to the overall consultation). 65 stated that it would have a disproportionate impact on those students with one or more protected characteristics. 96 said there would not be a disproportionate impact.14 respondents were not sure if it would have a disproportionate impact.

In the sections which follow, we have considered those concerns which have been raised by respondents to the consultation alongside other issues which we have identified through our own consideration of the relevant issues. In all cases our consideration of the issues has been informed by our previous work with stakeholders in developing subject content and the relevant literature.

In the September 2014 consultation, 10 respondents answered the equalities question. Six of the ten respondents were responding in relation to the ‘areas of interest’ section of the content, raising concerns that their restrictive nature would be likely to limit the number of girls who would study them. Since this consultation, the content has been changed and the ‘areas of interest’ have been removed, and therefore have not been considered in the following sections. The other responses to this consultation were in relation to assessment arrangements, which is outside the remit of the Department.

5.1 GCSE design and technology

Issue: Increased demand

The government consulted on reforming key stage 4 qualifications in 2012 and published its response and its equality impact assessment on decisions early in 2013. The response stated that: reformed GCSEs should remain universal qualifications, accessible, with good teaching, to the same proportion of students as currently sit GCSE exams at the end of key stage 4. It also stated that at the level of what is widely considered to be a pass (currently indicated by a grade C) there must be an increase in demand to reflect that of high-performing jurisdictions. At the top end, the new qualification should prepare students properly to progress to A levels or other study. This should be achieved through more challenging subject content and more rigorous assessment structures.

Design and technology GCSE subject content was developed in the context of these decisions.

Impact

There is no identified foreseen impact of changing to a single title on protected characteristics of: gender reassignment, pregnancy and maternity, religion or belief, sex or sexual orientation.

13 respondents raised the increased breadth of core knowledge within the subject content as a potential issue for SEN students. One respondent suggested that EAL students would be disadvantaged by the change.

Many of the respondents felt that the requirement to study a broad core, rather than a narrow specialism would mean lower-performing students would find it difficult to access the subject, and would be put off from doing so.

In relation to the concerns about GCSEs, DfE considered the evidence it had gathered during its September 2012 consultation on reforming key stage 4 qualifications, which indicated that a culture of high expectations is one of several consistent factors essential to high student attainment and good progress. The evidence suggested that, with the right teaching, all students will benefit from those higher expectations.

A discussion of this evidence can be found in the equality impact assessment we published in March 2013.[1] Our review of research indicated that the following factors are shown to have the greatest impact on preventing and responding to low student attainment:

- effective teaching
- a culture of high expectations
- understanding and meeting the needs of all students
- engaging and relevant curriculum
- initial assessments and on-going monitoring
- effective transition
- appropriate infrastructure and
- accountability at all levels

Andreas Schleicher, Deputy Director for Education and Skills at the OECD, has said that a common factor in high-performing systems is “the belief in the possibilities for all

[1] GCSE Reform Equality Analysis, DfE, March 2013

children to achieve" and there is evidence that suggests that, with the right teaching, students will benefit from those higher expectations[2].

The intention of reform is to ensure parity of quality and challenge across all subjects. We wish to ensure that students studying D&T GCSE will achieve a qualification whose value is recognised alongside other GCSEs and A levels, and which prepares them for further study or employment.

Conclusion

Our review of evidence indicates that a culture of high expectations is one of several consistent factors essential to high student attainment and good progress for all students, and particularly in responding to low student attainment. For this reason GCSE reform is specifically intended to raise the demand for all students, both more and less academically able. We feel the increased challenge is justified by the benefits we expect it to deliver in the form of higher attainment and better preparation for further study or employment.

We acknowledge that the increased demand may have a greater impact on some students who have protected characteristics which can make aspects of academic curricula more challenging, for example pupils with dyslexia or those from other national backgrounds for whom English is not their first language. However, we believe appropriate provision can, and should, be made to mitigate and support pupils with any additional challenge arising from increased demand in order to enable those pupils to benefit from greater equality of opportunity that will come from attaining higher standards. These provisions may take a number of forms including additional teacher support, extra time in exams and appropriate lesson differentiation, for example.

Issue: Change from a suite of titles to a single title

The reformed D&T GCSE content has moved from a number of material-focused titles sitting beneath the D&T 'umbrella', to a single qualification, where students acquire knowledge of technical principles and design principles across a range of materials and apply that knowledge within a 'contextual challenge' for their design and make project.

We have examined this issue in relation to two points:

- That students are no longer able to pick a specialist, material-based, title
- That the subject content will, necessarily, be broader

[2] Ofsted (2009) Twelve outstanding secondary schools: Excelling against the odds, OECD (2010) PISA 2009 Results: What Makes A School Successful

Impact

There is no identified foreseen impact of changing to a single title on protected characteristics of: gender reassignment, pregnancy and maternity, religion or belief, or sexual orientation.

Sex

26 respondents in the consultation felt that the changes would impact negatively on girls, with the majority referencing the removal of a separate textiles qualification - historically more popular with girls - as evidence for this. Most of these respondents felt that textiles-related content had not been adequately represented in the draft, and that therefore girls would be disengaged from the subject. They also felt that this would mean students would be unable to progress further in textile-related education and careers.

However, 25 respondents felt the changes would have a positive impact on equality, with a greater focus on mathematical and scientific understanding opening up more progression routes (see below for more detail on this issue). Many respondents felt this would be an opportunity to break down gender barriers and encourage more girls to study content that has been seen as more traditionally 'male'.

As also described previously, girls currently outperform boys on all existing design and technology subjects, yet more boys than girls choose to enter GCSE examinations in these subjects. As Ofsted (2011, p.23)[3] highlight, "the need to tackle this difference is critical" and moving to a broader range of topics within one GCSE may go some way to mitigating this.

It is possible that boys and girls may be less interested in traditionally gendered areas of subject matter (see above on which topics girls/boys currently favour), but if these are overcome, the expansion of knowledge and possible resultant breaking down of gender boundaries is positive.

Special Educational Needs and EAL

Although not itself a protected characteristic, as set out previously, 13 respondents raised the changes to the subject as a potential issue for SEN students. This could encompass some students with disabilities. One respondent suggested that EAL students would be disadvantaged by the changes, which could encompass some students with the protected characteristic of race (which includes nationality).

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[3] Ofsted (2011). *Meeting technological challenges? Design and technology in schools 2007-10.*

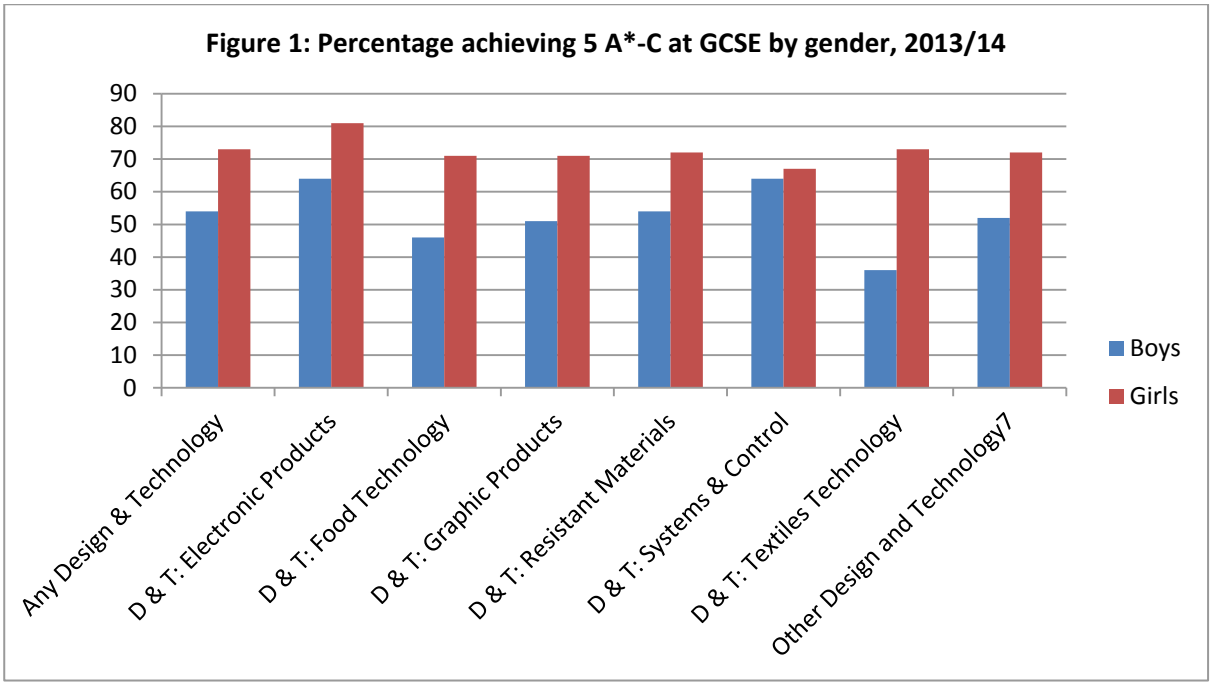
8 respondents felt the need to cover a wider range of core knowledge would impact on these students, as they would be expected to cover technical knowledge across a broader spectrum than previously and would struggle to access the content. Some respondents felt that SEN students would be discouraged from taking the subject at all, and would therefore, be more limited in their options at GCSE.

Response

There is an existing gender imbalance in the choices that boys and girls make in the suite of titles currently in Design and Technology: girls are more likely to opt for Food Technology and Textiles Technology GCSEs whilst boys are more likely to opt for Graphic Products, Systems and Control, Electronic Products and Resistant Materials GCSEs (e.g. DfES, 2007) (as can be seen in Figure 1, below). Ofsted (2011) highlight that although more boys are taking GCSEs in design and technology subjects, girls outperform boys, the “need to mitigate this difference is critical”.

DfE have responded to concerns raised in the consultation by reviewing the draft and adding greater clarity on the range of material groups and knowledge that all students study in this subject. The design and make practical project that all students must undertake, and which is worth 50% of the final assessment, can be approached and developed using any material that students choose, set around a contextual challenge put forward by Awarding Organisations in their specifications. The aim of the contextual challenges is to allow students to apply the knowledge they have studied in a ‘real-world’ design context, without being constrained by a narrow range of material specific options.

Moving to a single GCSE in Design and Technology may go some way to mitigating the gender imbalance in terms of both performance and take-up and have a positive impact through exposing all pupils to a broad range of topics and breaking down stereotypes. Students will still be able to produce a final outcome that is entirely textile-based if they choose to do so. Additionally, students wishing to study food will be able to take the new food preparation and nutrition GCSE, which will be first taught in 2016.



Source: DfE (2015).

We have responded in detail to the issue of the effects of increasing demand earlier in this document. A greater breadth of knowledge is part of how we have increased demand in this subject, and may have a greater impact on some students (for example pupils with special educational needs such as dyslexia or EAL students). We believe however, that appropriate provision can, and should, be made to mitigate and support pupils with any additional challenge in order to enable those pupils to benefit from greater equality of opportunity that will come from attaining higher standards.

Conclusion

Overall, in relation to the gender barriers discussed previously, opening up opportunities to study a wider range of technical knowledge will, we hope, enable all students to have a better understanding of potential future study and career options. Students with special educational needs and EAL students should equally be able to benefit from this increased understanding.

Issue: Specified and more detailed maths and science content

The revised D&T content sets out in greater detail (in the form of annexes to the main content) the mathematical and scientific knowledge that all specifications must cover.

Impact

There is no identified foreseen impact of a more detailed maths and science content on protected characteristics of: gender reassignment, pregnancy and maternity, race, religion or belief, or sexual orientation.

Sex

Past research on maths performance highlighted a traditional performance gap in favour of boys (Mullis et al, 2004). However, internationally, in the past four decades the gender gap has narrowed or even reversed (Robinson and Lubinski, 2011). In England, there was very little gender difference in attainment at the highest grades (A*-C) in maths GCSE in 2014/15 (boys = 68%; girls = 70%) (DfE, 2015).

For science, in 2014/15, a greater proportion of girls achieved A*-C grades in any science GCSE than boys, 76% compared to 71% respectively (DfE, 2015). A more detailed focus on science content may therefore disadvantage boys.

A small number of respondents felt the increased scientific and mathematical content would be off-putting to girls seeking a ‘textiles’ based course.

Many of the consultation responses were positive on the increased mathematical and scientific detail set out on the content, feeling that this would have the effect of improving perceptions of D&T as a rigorous subject, rooted in scientific and mathematical principles.

Special Educational Needs

Although not a protected characteristic, 13 respondents raised this as a potential issue as part of the consultation response. A small number of these respondents felt that with the increased level of scientific/mathematical knowledge requirements would impact on SEN students, and that they may be deterred from or struggle to complete the qualification.

Conclusion

As above, we acknowledge that the increased demand in scientific and mathematical knowledge may have a greater impact on some students who have characteristics, such as dyscalculia, which can make aspects of academic curricula more challenging. However, this has always been a risk given that these subjects have traditionally included mathematical content, although this has now been set out more clearly and in more depth. We believe appropriate provision can, and should, be made to mitigate and support pupils with any additional challenge arising from increased demand in order to enable those pupils to benefit from greater equality of opportunity that will come from attaining higher standards.

As information provided above sets out, the gap between boys and girls in relation to mathematical achievement has started to close. As girls still achieve higher grades in science-based subjects, there is some evidence to suggest boys may be at a disadvantage with increased scientific knowledge. However, the DfE has been clear throughout the reform process that raising demand in GCSEs is key to raising attainment and ensuring comparability internationally.

Overall, DfE believes that all pupils will benefit from the higher aspirations, attainment outcomes and strong reputation expected of reformed GCSEs. It is of no benefit to any student to pass a qualification that does not provide evidence – for employers or others – of their competence in key areas that are essential to progression.

6. Conclusion

We believe that overall the proposals for reformed design and technology GCSE subject content examined in this equality impact assessment will have a positive impact on equality of opportunity, by providing a respected qualification in which pupils, employers and further and higher education providers can have full confidence.

In examining the evidence and opinions we have collated, we believe the final changes proposed are objectively justified because they will have the effect of improving standards, employability and prospects for future learning in FE and HE. Where concerns have been identified about the potentially negative impact of content, we have responded to the concerns as set out above.

Increasing demand across all GCSEs including those, like design and technology, which have traditionally had a significant practical component, is intended to help achieve parity in the value to students of all qualifications and in the perception among employers and further/higher education institutions of the qualifications' worth. We are confident that where this presents challenges to students with protected characteristics, there are a number of appropriate and available forms of mitigation.

These include the provision of good quality teaching and support to students experiencing difficulties, such as those with special educational needs or English as an additional language. The quality of SEN teaching is central to ensuring pupils with SEN are given the best possible opportunities to achieve results in any of the GCSEs and A levels considered here. A summary of DfE's programmes to support good teaching for pupils with SEN is set out at Annex A.

Forms of mitigation also include the Pupil Premium, which is additional funding given to publicly funded schools in England to raise the attainment of disadvantaged pupils and close the gap between them and their peers. This funding is awarded per eligible pupil. It is not ring-fenced and can be used to help support pupils in whatever way their disadvantage impacts on their ability to access, engage with, or succeed in programmes of study.

Further forms of mitigation are already embedded in legislation or guidance, such as the JCQ's reasonable adjustments for candidates with disabilities or learning difficulties. Reasonable adjustments that are likely to be available will include extra time and in some situations exemptions are available where pupils are unable to participate in aspects of the course content. The availability of such an exemption in respect of a particular design and technology qualification offered by an awarding organisation will depend on how the practical element of that qualification has been designed. For example, if the 50% of the marks for the practical element of the qualification is divided between two discrete components – one encompassing design and the other manufacture – then an exemption from the manufacturing component will be available so long as it represents 40% or less of the available marks of the qualification. This is because Ofqual has specified, under

section 96(7) of the Equality Act 2010, that exemptions cannot be granted in respect of components which represent more than 40% of the available marks for a qualification. When designing their assessments awarding organisations will need to balance any considerations of the validity of the assessment with its accessibility to students.

Policy changes are not made in isolation – policies such as the pupil premium contribute to enabling more disadvantaged students to be properly prepared for GCSEs. The new primary National Curriculum for mathematics is focused on building firm foundations for all students, benchmarked against expectations in high-performing jurisdictions. The new curriculum places a greater emphasis on mental and written arithmetic, including teaching times tables early, written methods of calculation and applying mathematics to solve multi-step problems.

On the issue of sex, which has been raised as a key issue within the consultation, DfE believes it is important to ensure that GCSEs are accessible to all students, regardless of their sex. Working to break down gender imbalances is vital to ensure that both girls and boys have access to the same education and career opportunities. Equality is as much about equality of aspiration as it is about equality of opportunity. The changes to this subject will, we hope, enable all students to consider progression and career pathways they may previously not have considered or have been able to access.

The impact on the less academically able must also be considered alongside the impact on the less physically able, such as those students with certain physical disabilities and those managing pregnancy or physical impacts of gender reassignment. Where there may be reduced emphasis on practical performance, this can be seen as a positive impact on students for whom practical performance can be more challenging, thereby making these subjects more accessible and appealing for students with relevant protected characteristics.

As well as considering design and technology as an individual subject, we have also given consideration to any potential cumulative impact of the changes across subjects. As we are confident that any possible adverse impact identified in relation to this subject has appropriate means of mitigation, we have no reason to believe there will be any additional impact at the cumulative level.

Annex A: DfE programmes to support effective teaching for pupils with SEN

The quality of teaching is central to ensuring that pupils with SEN and Disabilities are given the best possible opportunity to achieve good results in their GCSE and A level studies. As well as reforming qualifications, DfE is committed to supporting the development of teachers' skills in meeting SEN.

Measures we have taken to support this include ensuring all initial teacher training (ITT) programmes train teachers to teach both mainstream and pupils with SEND. In order to be awarded qualified teacher status (QTS), trainees must satisfy the Teachers' Standards[4], which include a requirement that they have a clear understanding of the needs of all pupils, including those with SEN, and are able to use and evaluate distinctive teaching approaches to engage and support them. Teachers themselves tell us that the quality of training for SEN is improving.

The majority of new teachers rate this aspect of their training as good or very good and this proportion is consistently increasing: over eighty per cent of both primary and secondary trained teachers who responded to the latest NQT survey reported that their induction had supported them to teach pupils with special educational needs in their classes (DfE, Annual NQT Survey 2014).

Following Sir Andrew Carter's independent review of the quality and effectiveness of ITT courses, the Secretary of State appointed an independent working group made up of expert representatives from the sector to develop a framework of core ITT content. This includes considering Sir Andrew's recommendations around the SEND content of the proposed framework.

We have also funded 10 Teaching Schools and their ITT partnerships, to initiate, develop and implement innovative additions to their training programmes, to enhance the skills and knowledge of SEN for prospective teachers. The outcomes of these test and learn projects will be reported on at the end of next year.

We have developed specialist resources for initial teacher training through the National College for Teaching and Learning (NCTL) and advanced level online modules on areas including autism and speech and language needs, to enhance teachers' knowledge, understanding and skills

Between 2009 and 2014, we funded almost 11,000 new SENCOs to undertake the master's-level National Award for SEN Co-ordination.

We have also awarded contracts totalling more than £2.5m a year to a number of sector specialists, including the Autism Trust, Communications Trust, Dyslexia SpLD Trust and

[4] www.gov.uk/government/publications/teachers-standards

National Sensory Impairment Partnership (NatSIP) to support the implementation of the SEN reforms and provide information to schools and teachers.

The National Association for Special Educational Needs (Nasen) continues to run its SEND Gateway which was launched in May 2014. This is an online portal offering education professionals free, easy access to high quality information, resources and training for meeting the needs of children with SEN and disabilities. We are also funding Nasen (2015-16) to develop a free universal offer of SEN Continuing Professional Development (CPD) for teachers, including early years to post 16 which will meet the requirements of providing high quality teaching as described in the SEND Code of Practice. This will enable every teacher to access a package of online learning which takes an enquiry-based learning approach to effectively identifying and meeting the needs of children and young people with SEN.

The Department is also supporting the charity AfA3As to make the highly successful Achievement for All (AfA) approach available widely. It now provides whole-school support to around 2000 schools to improve outcomes for pupils with SEN and disabilities. We are also supporting them to provide leadership support to an additional 1200 schools and online support to around 10,000 schools to plan and manage the reforms as well as to close the gap for children and young people with SEN.

In 2014 and 2015 we provided £5.5m per year, to support a 10% increase in the number of training places for educational psychologists (132 per annum). This will increase to £6.1m per year, raising the number of training places further, to 150 in 2016 and again in 2017.

Department for Education

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