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Teacher training bursaries in England

An analysis of their impact on the quantity and quality of trainees

Andrew Noyes, Corinna Geppert, Joanna Mcintyre

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Executive summary

The challenge of recruiting sufficient numbers of high quality teacher trainees is common to many countries. In England, one of the strategies employed by government to incentivise entry to Initial Teacher Training (ITT) has been teacher bursaries. This unusual approach is set in the context of policy moves designed to establish education markets that will, it is hoped, increase competition, drive up quality and reduce inefficiency.

The re-landscaping of ITT has been underway for some time but was accelerated under the 2010 coalition government as part of a drive to improve quality and diversity in teacher education. The scale of bursary payments has changed since that time but the relationship between bursaries for teacher trainees, target numbers and recruitment remains unclear. Bursaries signal market value with some remaining high, some low and others fluctuating considerably over time. It is estimated that annual spend on the bursary programmes is somewhere between £167 and £292 million.

ITT bursaries are based on a flawed premise, namely that teacher quality can be predicted by degree outcome and that this is regardless of the relationship of the degree discipline to the subject taught[1]. Additionally there is no evidence to support the notion that bursaries are attracting and retaining more people to stay in the profession, especially in shortage subjects (Allen et al 2017).

Our primary recommendation is, therefore, that bursaries should be minimised or stopped and this resource be redistributed to evidence-informed strategies for supporting teachers to stay in the profession. This would be a more justifiable means of increasing teacher quality given the known relationship between years of service and teacher effectiveness. This would shift the emphasis from recruitment of applicants to better supporting early and ongoing professional development and retention.

The 2011 bursary system as set out by the then Secretary of State, Michael Gove, claimed a clear link between degree classification, the quality of subject knowledge and

[1] The training bursary level awarded is dependent on the subject in which a trainee wishes to teach and the grade of their highest academic qualification – not the subject of their academic qualification. For instance, a trainee with a first class degree in English will be eligible for a £26,000 training bursary if they are training to teach physics, and £15,000 if training to teach English. This does not change the process of selection or recruitment that the ITT provider would go through, including making judgements about the relevance of the degree to the subject of training. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/697803/Initial_Teacher_Training_bursaries_funding_manual_18-19.pdf

therefore bursary remuneration. Although the Department for Education (DfE) claimed some evidence for this link, international research casts doubt on the assumption that prior qualifications predict teacher quality and productivity. Moreover, a peculiar feature of England's degree classification system[2] further complicates this relationship[3]. In this report we consider whether the elision of degree outcome with quality has inadvertently created some unintended consequences.

As well as charting the changes in bursaries over time, particularly at secondary level, we make use of Higher Education Statistics Agency (HESA) data from England's 2015-16 ITT cohort to explore the relationship between one measure of academic quality – UCAS undergraduate entry tariff – and degree outcomes. These analyses lead us to a number of recommendations:

Recommendation 1: Research should be commissioned on the relationship between trainees' prior qualifications and characteristics and subsequent teacher productivity or quality.

For a particular annual cohort of trainees (2015-16), the degree classification bears little relationship to the initial tariff of students entering undergraduate study. This means, for example, that a student entering higher education with straight A grades at A-level and with a lower second class degree from an high entry tariff undergraduate programme would often have received a smaller bursary than, say, a student with C grades at A level and a first class degree from a new university. This is a thorny issue and deeply embedded in England's system of higher education but does illustrate the problem of how the potential quality of teachers should be assessed.

Recommendation 2: Independent research should be commissioned on the effectiveness of bursaries and other incentives to increase and diversify trainees

The analysis in this report highlights the weak relationships between levels of bursary payments and the meeting of recruitment targets. In some subjects there seems to be no effect where in others it appears to be elastic, to a greater or lesser extent. There is no current evidence on the numbers of trainees who would have started training with significantly lower bursary payments. Given that the ultimate goal is not simply to meet trainee targets but rather to ensure sufficient numbers of quality teachers in schools, such research should also consider relationships between ITT bursaries and early career retention.

[2] The allocation of first, 2i, 2ii etc. class degree refers to positions *within* a cohort in a single institution. An award of 2i is not necessarily comparable between institutions

[3] See for example, Hindmarsh (2018) https://www.hepi.ac.uk/2018/07/02/degree-standards-universities/

Recommendation 3: The within-subject differentiation of bursary payments should be abandoned for honours degrees[4]. Any differentiation of bursaries should be limited to between-subjects.

In recent years the **within-subject** variation of bursary payments has reduced. This might be because of a recognition that degree classification is a poor measure of teacher effectiveness, even though government and some HEIs have used it as a strong proxy for quality[5]. Some ITT providers have acted very cautiously in the face of audit and inspection regimes. **Between-subject** variation remains and this differentiation, although not without problems, is more defensible in trying to address between-subject variation in teacher supply.

Recommendation 4: A significant part of the bursary budget should be redirected to incentivise retention and to support professional induction and growth during the first five years.

Although the limited research to date shows that prior qualifications are not clear predictors of teachers' later effectiveness, there is good international evidence to show that teacher productivity increases over the first few years in the profession. Given limited public resources, a drive to improve teacher quality would therefore be better served by policies that strive to retain teachers in the profession for longer, even for an additional year or two.

A move to reprioritise budget would helpfully signal a longer time period for teachers' early development. Initial training and induction would be better thought of as a 3 to 5-year process with top-up development and retention payments building a more stable, quality profession. This would not only increase teacher quality but, by ameliorating the high attrition rates in the first five years, the required number of ITT starters would be reduced.

[4] Whilst this within subject variation has now largely gone, there is still an arbitrary cut off which does not take into account prior attainment and other quality indicators. Students with 3rd class honours degrees from high entry tariff institutions do not receive any bursary. Decisions about entry should take into account academic indicators as well as make use of professional assessments of the potential of trainees.

[5] Some HEIs have rejected applicants with a lower second-class degrees irrespective of prior attainment and context (e.g. straight As and a 2ii from a prestigious Mathematics department) due to the prevailing rhetoric and fear of losing out in the annual allocation of teacher training places that existed for some years. In the last few years, as the policy rhetoric has shifted, some of those same HEI have been chastised by the Schools Minister for turning away potentially good teachers. (Gibb, 2018, https://www.nationalcollege.org.uk/sites/default/files/sites/default/files/letter_from_minister_gibb_29th_january_2018.pdf)

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Introduction

Many European and Anglophone countries face challenges in the recruitment of new teachers, partly due to the unattractiveness of the profession. The uneven distribution of teachers across geographical areas and supply shortages in some subjects are common challenges (Eurydice, 2015, 2018; Sucher, Darling-Hammond & Carver-Thomas, 2016). The OECD's *Teachers Matter* report pointed out that in addition to the lack of attractiveness of teaching as a career, many countries have concerns about developing teachers' knowledge and skills; recruiting, selecting and employing teachers, and retaining effective teachers in schools (OECD, 2005).

In many OECD countries, a large proportion of the teacher workforce is over 50 years old. However, the OECD notes that the UK (and the US) has a relatively young workforce (2017, p. 394). This is, it is suggested, partly due to successful recruiting campaigns. For example, the Conservative and Liberal Democrat coalition government (2010-15) started the *Your Future: Their Future*[6] campaign, featuring interactive online films and recruitment events to get more high-quality teachers into England's classrooms. But the peculiar UK position might also have to do with the disproportionately high losses of more experienced senior teachers.

In April 2018, the *Tes* reported that England needs 47,000 extra secondary teachers by 2024 to cope with rising pupil numbers.[7] The shortage of teachers has also resulted in the government spending £10 million recruiting 600 foreign teachers to fill mathematics, physics and modern language teacher positions.[8] In Germany[9] and Austria[10] there is a parallel debate on making it easier for schools to recruit new teachers and provide financial incentives for students to start teacher training.

Further afield, New Zealand has launched a $9.5 million teacher supply package including a *Voluntary bonding scheme* (focusing on new teachers of science, technology, maths and te reo Māori nationwide); the *Auckland beginner teacher project*, the *Teacher Education Refresher (TER) course* (to help retain experienced teachers and attract back teachers), *Teach First NZ* (recruiting top graduates and professionals into schools where they teach while completing a postgraduate teaching

[6] https://www.gov.uk/government/news/your-future-their-future-new-teacher-recruitment-campaign
[7] https://www.tes.com/news/exclusive-england-needs-47000-extra-secondary-teachers?awc=7026_1533024335_fce5425fcc9bc91bc3221c2110b7eaef
[8] https://www.independent.co.uk/news/education/education-news/government-recruiting-600-foreign-teachers-fill-maths-science-languages-teaching-shortage-a7843116.html
[9] https://www.sueddeutsche.de/news/bildung/bildung---erfurt-bildungsministerium-will-offensiv-um-lehrer-werben-dpa.urn-newsml-dpa-com-20090101-180219-99-147698
[10] https://wien.orf.at/news/stories/2904821/

qualification) and a *recruitment fund*, which can be used by schools to attract or retain a teacher.[11]

In April 2017 *PR Week* reported that the Department for Education had doubled its campaign budgets to attract people into teaching.[12] Websites such as *Get into Teaching*[13] provide information on incentives to attract students to the teaching profession or to specific subjects. One of these incentives is training bursaries, but these are not available to all trainees on all routes and the system of financial support and initiatives is complex (Foster 2018). Bursaries are available for some subjects and, for postgraduate entrants, are predicated on degree classification though the eligibility criteria changes annually. The type of teacher preparation provision is also a factor with the key distinction being between fee-paying or salaried routes, though this simplifies what is an "ever more complex patchwork of provision" (Whiting et al, 2016). Indeed, the complexity of the teacher training landscape has come under criticism with the 'plethora of routes' available to the cohort in our study described as 'confusing' (Education Committee 2017, 11).

This report examines the financial incentives for entering Initial Teacher Training in England at a time when the country faces considerable challenges in the recruitment, retention and geographical distribution of high-quality teachers. The recent history of teacher training bursaries is examined and important questions about the kinds of people who have been incentivised by the policy are investigated.

The Department for Education (2018, p. 7) states that training bursaries:

> …provide a financial incentive for high quality graduates to enter and also complete ITT. Training bursaries are available for individuals training to teach in a range of subjects. Training bursary rates vary by course subject and degree classification of the trainee. The training bursary award is fixed for the duration of the trainee's ITT programme and is not affected by the length or mode of training being undertaken (Department for Education, 2018, p. 7).

These training bursaries replaced the "Golden Hello" scheme which was closed to trainees starting ITT in 2011/2012. In the new scheme, bursaries are available for those training to teach physics, chemistry, languages, computing, geography, biology, classics, English, design & technology, history, music, religious education and secondary and primary mathematics. Depending on the subject, students can receive tax-free bursaries of up to £26,000[14], which is significantly more than the salary for

[11] https://education.govt.nz/news/teacher-supply-package
[12] https://www.prweek.com/article/1430786/ dfe-doubles-campaign-budget-attract-people-teaching
[13] https://getintoteaching.education.gov.uk/
[14] A limited number of scholarships of £28,000 are available in some subjects.

newly qualified teachers (NQT) outside of London. It should be noted that larger bursaries cover the costs of the typical fee for a one-year programme (£9,250 which is the standard undergraduate fee) as well as providing significant additional cost-of-living expenses in an attempt to remove financial barriers to entering the teaching profession.

When contextualising this data within OECD countries, salaries for newly qualified teachers in England are below the OECD average. A newly qualified teacher in England might expect to earn a starting salary of £22,917, which after tax and National Insurance means take home pay is considerably lower that many of the tax-free bursaries currently on offer. In contrast, the salary at the top of the leadership pay scale and maximum qualifications exceeds the OECD average (OECD, 2017, p 365). This gap is unique within the Anglo-American area, with the US and Canada having minimum salaries above the average, but maximum salaries within the OECD average.

According to the National Audit Office report *Training New Teachers*, the government spent £620 million on bursaries from 2010/11 to 2014/15 and planned to spend £167 million each in 2015/16 and 2016/17 (National Audit Office, 2016, p. 34). In 2018, Minister of Schools, Nick Gibb, reported on the parliament's blog: "In the academic year 2016/17, the Government awarded 16,637 bursaries to post graduate trainee teachers at a cost of £191,022,000. In addition, 326 scholarships were awarded at a cost of £8,725,000."[15] The authors have estimated the scale of bursaries for 2018/19 (Table 1) based on the target numbers of the Teacher Supply Model (16,387 teachers needed in subjects that receive bursaries). This suggests that, depending on the degrees earned, between £250 and £262 million could be spent in 2018/19 for teacher trainees in secondary subjects alone.[16]

The Nuffield Foundation concluded in its 2016 report *The Longer-Term Costs and Benefits of Different Initial Teacher Training Routes* (Allen et al., 2016) that teacher bursaries represent a significant cost, while their effectiveness for recruiting and retaining high-quality teachers is questionable; four in ten trainee teachers are not in teaching five years after they finished their training. Against this backdrop, this current report describes how teacher bursaries have developed in recent years and the extent to which the recruitment of highly qualified teachers has been, and could be, achieved through this incentive scheme.

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[15] https://www.parliament.uk/written-questions-answers-statements/written-question/commons/2018-02-08/127630

[16] Estimation based on Department for Education (2018a). Initial teacher training (ITT Census r the academic year 2018 to 2019, England. https://www.gov.uk/government/statistics/initial-teacher-training-trainee-number-census-2018-to-2019; assuming that 95 percent of the students will receive at least an Upper Second-Class honours degree.

Table 1: Estimation of Bursaries for 2018/19

		Bursaries	Target n.	Estimated Bursaries based on target n.	Recruitment n.	Bursaries based on recruitment n.
Mathematics		£20,000	3,116	£59,204,000	2,195	£41,705,000
Biology		£26,000	1,188	£29,343,600	1,815	£44,830,500
English		£15,000	2,558	£36,451,500	2,815	£40,113,750
Physics		£26,000	1,219	£30,109,300	575	£14,202,500
Geography		£26,000	1,531	£37,815,700	1,300	£3,2110,000
Computer Sciences		£26,000	723	£17,858,100	530	£13,091,000
Chemistry		£26,000	1,053	£26,009,100	835	£20,624,500
Languages		£26,000	1,600	£39,520,000	1,450	£35,815,000
	First	2i				
History	£9,000	£4,000	1,180	£4,259,800	1,190	£10,174,500
Religious Education	£9,000	£4,000	643	£2,321,230	375	£3,206,250
Music	£9,000	£4,000	409	£1,554,200	295	£2,522,250
Design & Technology	£12,000	£9,000	1,167	£8,052,300	295	£3,363,000
				£292,498,830		£261,758,250

This report proceeds in two main sections. Firstly, the history of bursary payments by subject are presented. The focus is mainly on secondary level subject specialisms. Each subject is considered in turn together with analysis of the relationship between targets, recruitment to ITT and bursaries. The second section uses a national dataset provided by the Higher Education Statistics Agency (HESA) to consider questions around who is recruited into ITT programmes and what bursary payments they received. The key concern here is to compare this cohort on two possible measures of quality: 1) degree classification and 2) tariff on entry to undergraduate study.

Development of bursaries over time

Since the introduction of the current scheme, the size of the bursaries has changed[17] and the differences between subjects, and within subjects, has fluctuated. These variations in target recruitment numbers, and on variations in the bursaries that are designed to support the attainment of those targets, are driven by the Teacher Supply Model (TSM). In the first section of this report, each phase and subject is considered in turn to show how the TSM targets and bursaries have fluctuated over the last four years.[18]

The amount of bursaries is dependent on the undergraduate degree of the prospective trainee. A degree may be awarded with or without honours, with the class of an honours degree usually based on a weighted average mark of the assessed work a candidate has completed. The degree classifications are first class honours (1st), which is the highest honours classification and indicates high academic attainment; upper second class honours (2i), which is a minimum requirement for entry to many postgraduate courses in the UK; lower second class honours (2ii), third class honours (3rd) and an ordinary degree (pass).

Overall, about a quarter of students gained a first class degree in 2016/17, another half of the students an upper second class honours degree and a fifth a lower second class honours degree (see Figure 1).

[17] Data drawn from Department for Education (2014, 2015, 2016, 2017)
[18] The report deals with data from 2014/2015 till 2018/2019. Former reports on bursaries (2012/13 and 2013/14) have been withdrawn.

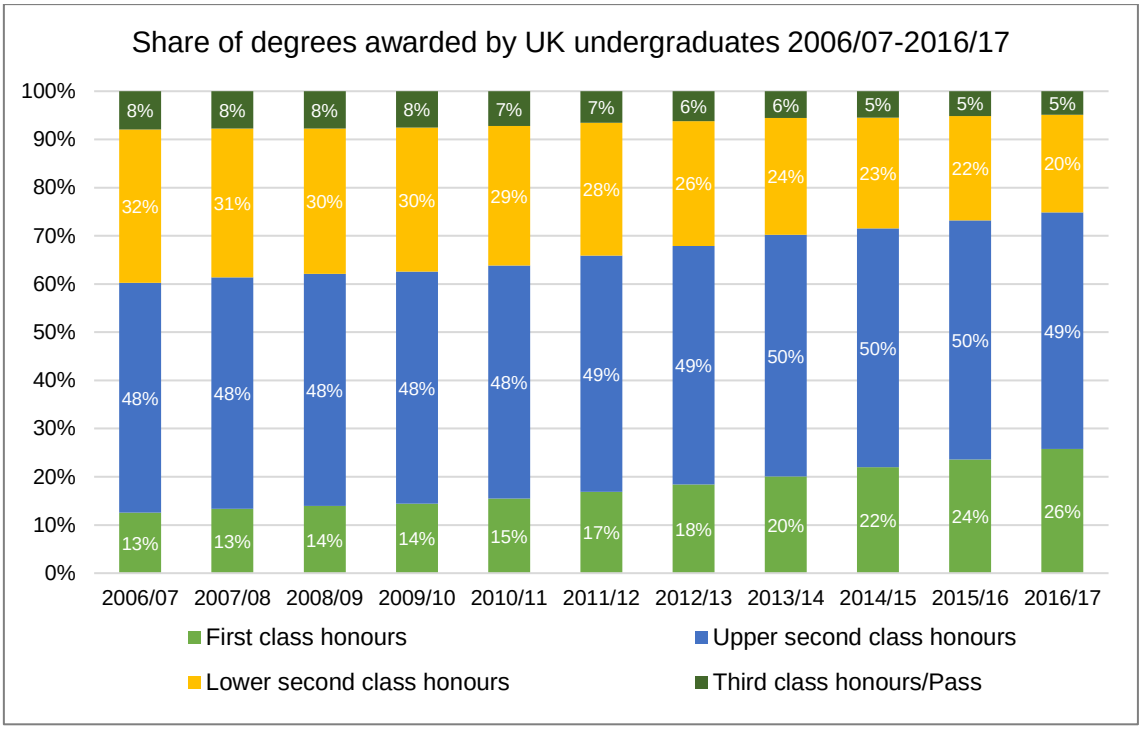

Figure 1: Share of degrees awarded by UK undergraduates 2006/07-2016/17 (https://www.hesa.ac.uk/data-and-analysis/students/chart-9)

A closer investigation of subjects reveals that there are considerable differences in the amount of bursaries received and the academic attainment level needed to receive bursaries. Bursaries for those training to become primary school teachers were introduced in 2016/17 for trainees with a first and a 2i. In 2017/18 only trainees with a first received bursaries. The bursaries are low at only £3,000. Target numbers for primary were not met in 2014/15, but in the following years the number of trainees starting were always above the target number.

The target numbers for religious education have never been met in the years since 2014/15. In 2015/16, government introduced bursaries of £9,000 for students with a first and £4,000 for students with a 2i. The number of students starting, however, remained stable with around 400 trainees each year.

Comparing target numbers and starters on design & technology ITT programmes reveal a large gap with only around half of places filled. In 2015/16 the bursaries for students with a first increased from £9,000 to £12,000 and for students with a 2i from £4,000 to £9,000. In 2015/16, even students with a 2ii received bursaries of £4,000. There was, however, no increase in bursaries in the following years, although the gap remained.

Target numbers of students starting music ITT courses have not been met since 2014/15. However, the bursaries for trainees with a first (£9,000) and students with a 2i (£4,000) remained stable over time.

Bursaries for students with a first and a 2i in computing were quite high in 2014/15 at £20,000. The incentives for students with a first increased the next year to £25,000 and remained stable until 2017/18. Bursaries for students with a 2i increased in 2017/18 to match the bursaries of students with a first degree. Students with a 2ii received £15,000 in 2014/15; bursaries for them increased steadily to match the bursaries of the other two subgroups in 2017/18. In 2018/19 there is only a small rise in bursaries by £1,000 up to £26,000 for all the three subgroups. Target numbers were always higher than the number of recruited persons. The increase of bursaries did not affect this gap in computer sciences.

In all of these subjects there does not seem to be compelling evidence that the bursaries are in any way influencing the supply of new trainees. At best the link is very elastic. In the next section secondary subjects that the DfE considers to be part of the English Baccalaureate will be described in more detail (i.e. English, mathematics, science, history, geography and modern languages).

Bursaries in Mathematics

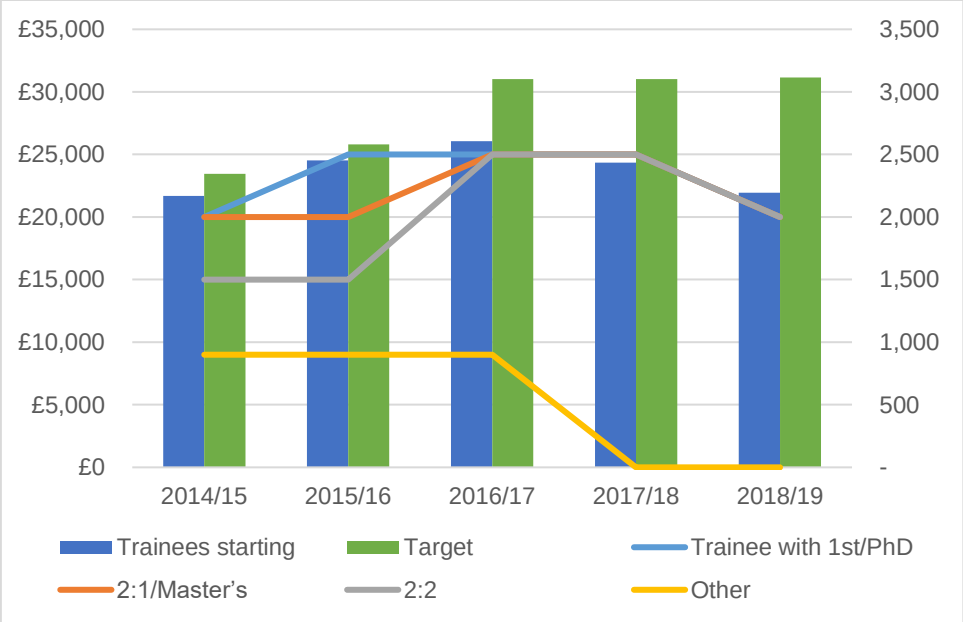

Figure 2: Development of bursaries in Mathematics

Mathematics and physics are the only subjects where all students, even those without a first, 2i or 2ii, received bursaries until 2017/18 and bursaries started at a high level. Students on a mathematics ITT programme with a degree lower than 2ii received almost the same bursary as those with firsts in biology, English, history or geography.

The bursary payment for students with a first increased in 2015/16 whilst others remained the same. The associated gap between the target number and starters decreased considerably though whether this can be explained by the bursary is a moot point.

In 2016/17 target numbers were met and it seems that this might be related to the increase in bursaries for students with a 2i and a 2ii. Students having a degree below 2ii were not awarded bursaries from 2017/18 and the number of trainees decreased again. The recruitment drop in 2017/18, despite the ongoing high level of bursary, is mirrored in the sciences so some other factors may be at play. It would be interesting to know whether the rises in 2016/17 'flushed out' those with lower degree classes who had not until then committed to teacher training.

There are additional incentives for students who train to be mathematics teachers though it is not known how clear these options are to applicants. In addition to bursaries, students with at least a 2i can apply for a scholarship from the Institute of

Mathematics and its Applications (IMA). Successful applicants will receive a tax-free scholarship of £22,000.[19]

The Independent (18.1.2016[20]) explained that because of the shortage of mathematics teachers, schools were offering potential teachers incentives, such as welcome bonuses, gym memberships and support with their housing. Schools were paying up to £44,000 for a newly qualified teacher.[21] This market influence is felt particularly strongly in mathematics where the influence of a number of policy priorities is increasing the demand for teachers (e.g. the agenda of maths-for-all-to-18 has seen the introduction of Core Maths and GCSE resits, both of which place addition staffing demands on schools and colleges).

The *Maths and Physics Chairs Programme*, which was launched in 2014 through the *Researchers in School Programme*, is another incentive for people interested in teaching mathematics or physics. It aims to recruit postdoctoral researchers to train and teach in schools. “For the 2017 intake, Mathematics, Physics and Engineering subject specialists who train to be teachers in Maths or Physics in will be eligible for a salary of up to and benefits package worth up to £40,800 in the first year, rising in years two and three”.[22] The overall contribution to teacher supply in this area is, however, tiny. The programme has been expanded in 2018 to cover all EBacc subjects.

In October 2017, the Secretary of State for Education published the Government’s strategy to ensure high quality education after Brexit, which also included “early retention payments of £5,000 in the third and fifth year of a mathematics teacher’s career. Increased amounts of £7,500 will also be available to encourage the best maths teachers to teach in more challenging schools.”[23] Unfortunately, a drop in recruitment figures for 2018/19 suggest that this strategy might not be working.

Under the *Future Scholars Programme*, mathematics and science undergraduates will also be offered up to £15,000 in return for a commitment to teach for three years after graduating.

[19] https://getintoteaching.education.gov.uk/funding-and-salary/overview/funding-by-subject/funding-for-training-to-teach-maths
[20] https://www.independent.co.uk/news/education/what-does-a-maths-teacher-make-a6820146.html
[21] https://www.telegraph.co.uk/education/maths-reform/9168744/Make-Britain-Count-reward-maths-with-more-cash.html
[22] https://researchersinschools.org/about/maths-and-physics-chairs-programme/
[23] https://www.gov.uk/government/news/new-education-and-skills-measures-announced

Bursaries in Physics

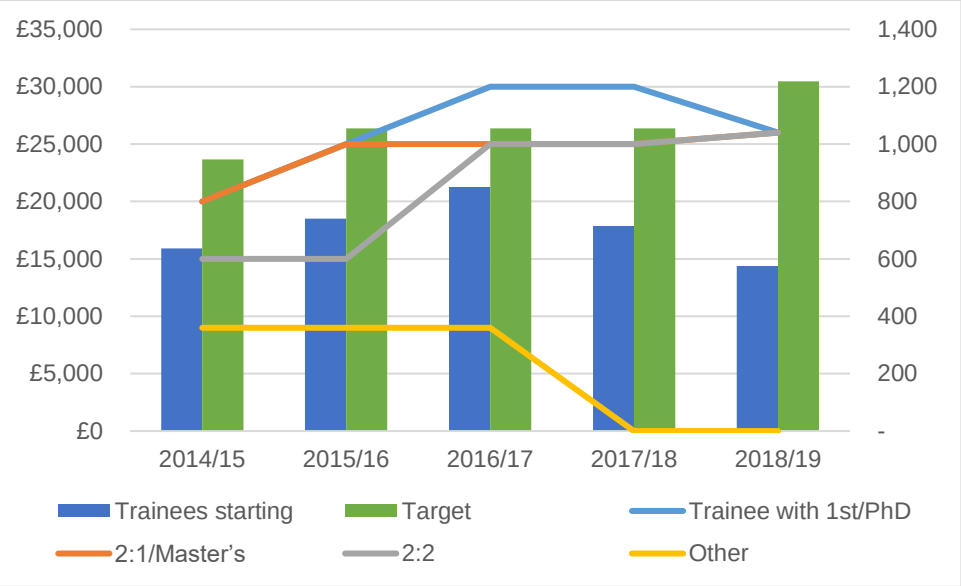

Figure 3: Development of bursaries in Physics

Bursaries in physics were highest in 2016/17 and 2017/18 for students with a first-class degree. Until 2016/17 even students with a degree lower than 2ii received a bursary of £9,000. In 2017/18, where this was not the case anymore, the number of trainees decreased and the target was not met with about 300 students missing. The number of starters has continued to fall in 2018/19.

In addition to bursaries, students with at least a 2i can apply for a scholarship from the Institute of Physics (IOP). There are a limited number of available scholarships and these, like those in other subjects, are oversee by the learned societies. Successful applicants will receive a tax-free scholarship of £28,000.[24] In 2015/16 teacher subject specialism training was launched, aiming at upskilling teachers who do not specialise in mathematics or physics.

Despite the high level of training bursaries the recruitment of physics teachers to ITT is a significant challenge. As in the case of mathematics, despite the high level of the bursaries there was a drop in recruitment to the most recent year. Whilst it is understandable that there might be concerns about whether this fragile level of recruitment would be maintained without the bursary system, it is also fair to say that the evidence of the link between bursary and recruitment to ITT is mixed at best.

[24] https://getintoteaching.education.gov.uk/funding-and-salary/overview/funding-by-subject/funding-for-training-to-teach-physics

Bursaries in Chemistry

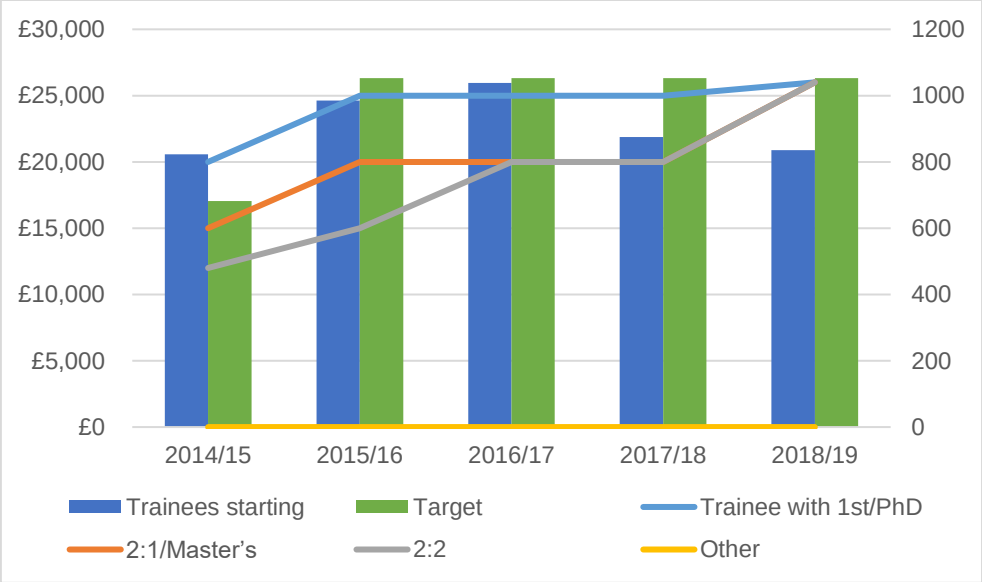

Figure 4: Development of bursaries in Chemistry

The number of trainees starting ITT chemistry in 2014/15 was bigger than the target number. As the forecast for the academic year 2015/16 suggested an increase of teachers needed, also the bursaries increased by £5,000.

In 2016/17 only the bursaries for trainees with a 2ii increased and were now the same as for students with a 2i. As a result, target numbers were almost met. Bursaries remained stable in 2017/18, producing again a gap between teacher trainees starting and the target number. This is the same effect noted in mathematics and physics but the increase in some bursaries has slowed the decline in new starters in 2018/19 compared to that see for mathematics and physics above.

In addition to bursaries, students with at least a 2ii can apply for a scholarship from the Royal Society of Chemistry (RSC). Successful applicants will receive a tax-free scholarship of £28,000.[25]

[25] https://getintoteaching.education.gov.uk/funding-and-salary/overview/funding-by-subject/funding-for-training-to-teach-chemistry

Bursaries in Biology

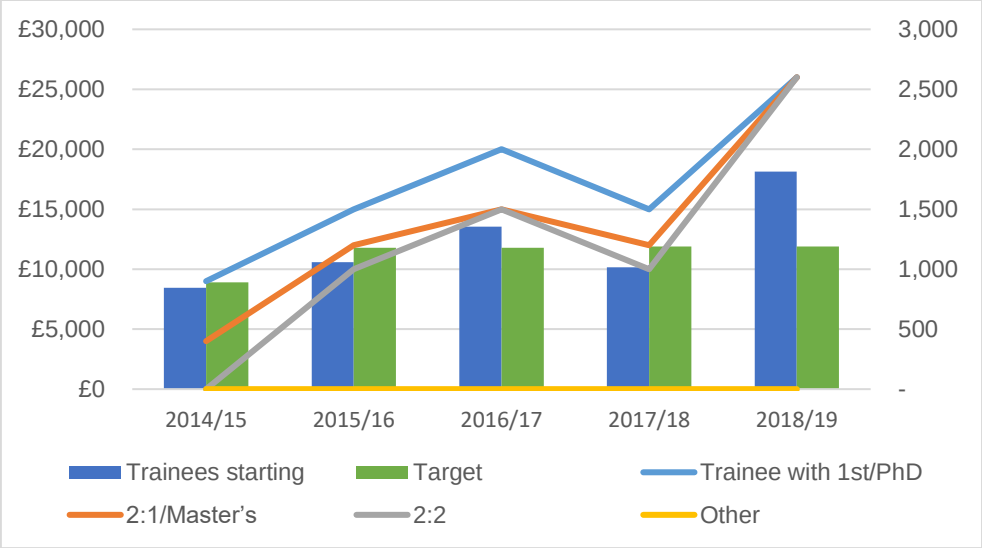

Figure 5: Development of bursaries in Biology

Bursaries for biology students increased steadily from 2014/15 until 2016/17 for trainees with a first and a 2i, while new bursaries were introduced in 2015/16 for trainees with a 2ii. As a result, the number of recruited teacher trainees exceeded the target number in 2016/17 (1,356 beginners vs. 1,178 target). This is an unusual example of where the bursary does appear to have some relationship to the recruitment pattern.

In 2017/18 the target number remained stable, however, bursaries decreased with an associated drop in the number recruited. That said, it might well be that some of the more general decline noted in the previous cases is also playing into this pattern here. In 2018/19 all trainees will receive bursaries of £26,000, which means that bursaries for trainees with a 2ii will increase by £16,000. Unusually, the result of this rise has been an excessive growth in starters with numbers exceeding the target by some way. It is not clear why the bursary payments needed to be any more that the level that appeared to work in the 2016/17 year.

One of the interesting features of biology (and chemistry) is that a number of applicants could choose either of these routes from previous degrees in biochemistry (for example). Such students can swing towards the best paying bursary knowing they will need to train to teach general science anyway.

Bursaries in English

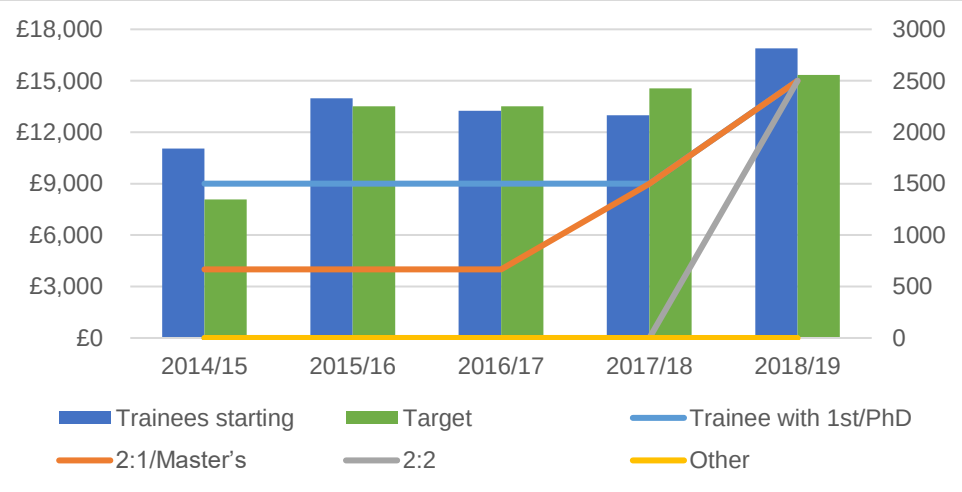

Figure 6: Development of bursaries in English

In 2014/15 and 2015/2016 the number of ITT trainees in English was higher than the target number. This changed in 2016/17 with targets not met. With a rising target number in 2017/18, bursaries for those holding a 2i were increased to match those with a 1st but this had no demonstrable impact on the total number of starting trainees in 2017/18.

As a result of the inertia above, in 2018/19 students with a 2ii will receive bursaries for the first time. All English trainees with first, 2i and 2ii degrees will receive £15,000 which is a significant shift for those with 2ii. This marked increase in bursaries has had the desired effect but it is impossible from the available data to know whether this is a sustainable trend or has merely encouraged recent graduates to now consider teaching under these more favourable conditions.

Bursaries in Modern Languages

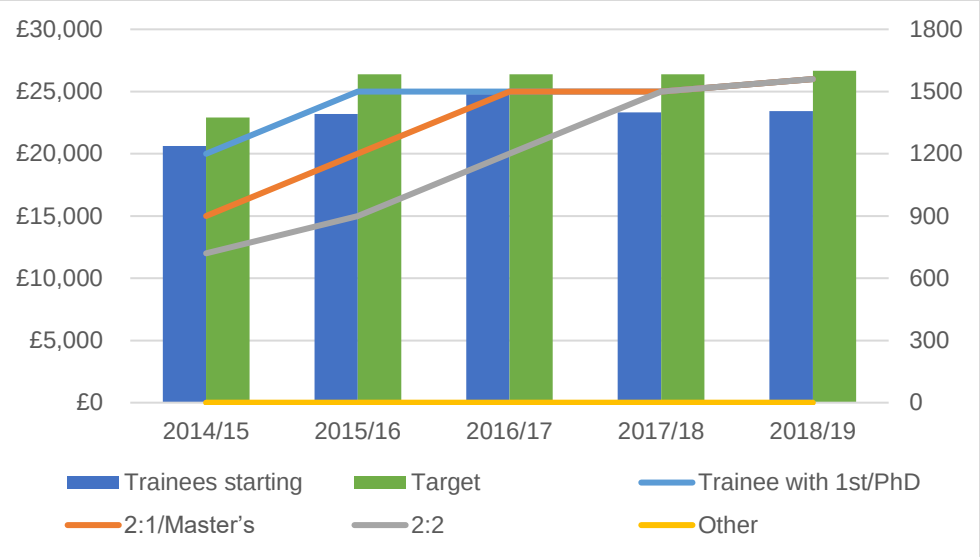

Figure 7: Development of bursaries in Modern Languages

For modern languages, bursaries for trainees with a first remain stable over time, while it seems as if the gap between students starting and the target number was meant to decrease by attracting students with a 2i or a 2ii. Bursaries for them increased over time, however, the number of trainees applying remained stable. Unlike in the case of Biology, there seems to be no effect of bursaries on recruitment in this subject area and Modern Languages have arguably suffered as a result of the UK decision to exit the EU.

There are additional funding sources for trainees in French, German or Spanish. Trainees with at least a 2i can apply for a scholarship from the British Council. Successful applicants will receive a tax free scholarship of £28,000.[26]

In addition to these incentives, government announced in October 2017 that a student loan reimbursement programme for science and modern language teachers in the early years of their career should benefit them with about £540.[27]

[26] https://getintoteaching.education.gov.uk/funding-and-salary/overview/funding-by-subject/funding-for-training-to-teach-languages
[27] https://www.gov.uk/government/news/new-education-and-skills-measures-announced

Bursaries in History

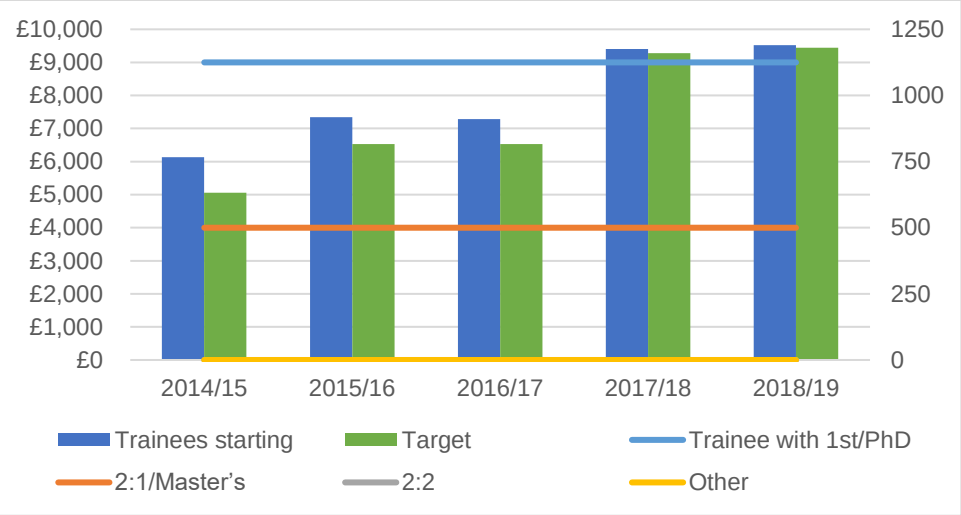

Figure 8: Development of bursaries in History

Bursaries for history students are relatively low, but remain stable over time. The target number has always been met in recent years. Although the target number for 2017/18 increased, there was no change in bursaries.

History is also the only secondary EBacc subject where there are still distinctive bursaries for students with a first and a 2i for 2018/19. Incentives seems to have no influence on the number of trainees starting ITT History anyway which raises the question of whether this is public money well spent.

Bursaries in Geography

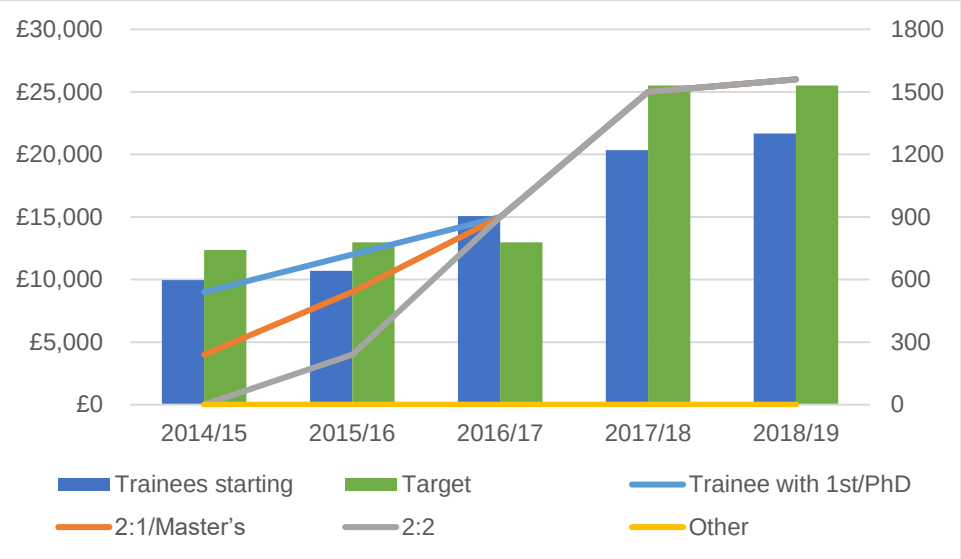

Figure 9: Development of bursaries in Geography

In 2014/15 only students with a first or a 2i degree on geography ITT programmes received bursaries. As the target number was not met, the bursaries increased in 2015/16. In addition, also students with a 2ii received bursaries. The increase had an effect in 2016/17, where bursaries were raised again (by £10,000) and all students with a 2ii, 2i or first class degree received the same bursary.

In biology, the reaction to exceeding the target number in 2016/17 was to decrease the bursary. In contrast, the doubling of geography's target warranted a bursary increase in 2017/18 and this seems to have had some effect, though not to the extent needed. The increased number of starters has been maintained in 2018/19, though still falls short of the required target.

In addition to bursaries, students with at least a 2i can apply for a scholarship from the Royal Geographical Society with IBG. Successful applicants will receive a tax-free scholarship of £28,000.[28]

[28] https://getintoteaching.education.gov.uk/funding-and-salary/overview/funding-by-subject/funding-for-training-to-teach-geography

Summary

The relationship between bursaries, targets and entry numbers is far from clear. The effectiveness with which bursaries can mediate gaps between, and changes in, target and recruitment numbers varies by subject and is more or less elastic. So, for example, in biology an increase or decrease in bursaries seems to be quite closely connected to the numbers of trainees applying for a study place (inelastic). The same can be shown for geography though the response to the stimulus of bursary change is more delayed (elastic). There seems to be, however, no clear relationship between the numbers of trainees starting, target numbers and bursaries for chemistry, English, modern languages, history, religious education or computer science.[29]

The analysis also reveals some interesting findings on the value of subjects. Bursaries for science subjects are generally higher reflecting the STEM agenda and the more challenging and competitive recruitment environment for maths and science graduates. Bursaries here are more likely to increase or decrease in response to changing recruitment and there are also additional funding sources such as scholarships available. Subjects like religious education, music or design & technology, however, have stable bursaries over time, although target numbers were never met.

There is a clear trend of reducing or losing the variation of bursary by undergraduate degree class. In 2018/19 students in almost all subjects (except history, religious education, music and design & technology) receive the same amount of bursaries, regardless of their undergraduate degree being a first class honours, upper second or lower second class honours degree. However, graduates with a 3rd class honours degree from high entry tariff institutions, even Oxbridge, would not be entitled to a bursary. This change was reflected in recent DfE correspondence with ITT providers in which the minister explained that degree classification is not a helpful differentiator of potential to be a quality teacher. This argument will be developed further in the following section.

[29] Data for 2018/19 recruitment are not available at the time of writing

A national cohort analysis (2015-16)

Having set out the trends in target and recruitment numbers, as well as the changing bursary offers, for the last four years, this next section analyses a Higher Education Statistics Agency (HESA) dataset that includes students on ITT course in the year 2015/16.

In recent years the routes into teaching have diversified with the main ones being:

- University-led routes leading to Postgraduate Certificate of Education (PGCE) and Qualified Teacher Status (QTS)
- School Direct routes vary; some offer QTS only whilst those working in collaboration with an HEI include the traditional award of a PGCE in addition to the mandatory QTS
- School Centred Initial Teacher Training (SCITT) is led by Teaching School lliances. They manage the full fee (unlike the previous two categories where fee income goes to the HEI partners initially). Some SCITTs partner with HEIs to offer postgraduate awards.
- Teach First is a national scheme that is quite different in philosophy to the above routes but includes a PGDE qualification.[30]
- Assessment Only routes involve no training but offer a way for non-qualified teachers with two years' experience and a degree to gain QTS.[31]
- Other routes make up a very small part of the landscape but include Troops to Teachers[32], Researchers in Schools[33], Future teaching scholars[34] as well as part-time and accelerated training[35].

The analysis in the following section focuses on secondary courses and the larger routes that comprise the majority of the ITT numbers.

[30] https://www.teachfirst.org.uk/
[31] https://getintoteaching.education.gov.uk/explore-my-options/teacher-training-routes/specialist-training-options/assessment-only
[32] https://www.ucas.com/postgraduate/teacher-training/train-teach-england/undergraduate-teacher-training-england/troops-teachers-non-graduate-programme
[33] https://researchersinschools.org/
[34] https://www.futureteachingscholars.com/
[35] https://www.ucas.com/undergraduate/what-and-where-study/distance-learning-and-part-time-study

What kind of data is included in the analysis?

The data set provided by HESA included students in a wide range of postgraduate subject areas. The largest group of students are those aiming for a Postgraduate Certificate in Education (PGCE) or Professional Graduate Diploma in Education (PGDE) (68 % of the sample) and the following analysis is based on this homogenous group of teacher trainees. Following a number of initial steps to clean the data, 20,666 students were retained. The next step further reduced this to students with an ITT specialism. This was not applicable for 71 students and another 2,488 did not study a subject as ITT specialism, which left 20,107 students in the data set.

The final decision in the data preparation process was to focus only on the secondary EBacc subjects of science, mathematics, English, languages, history and geography. Students in computer sciences were included due to growing policy interest in this area and there being high bursary payments. This reduced the data set to 6,820 students who studied for one of the above secondary subjects as an ITT specialist subject for getting a PGCE.[36] Table 2 sets out the sample size in more detail in comparison with target numbers and official DfE data on total recruited (across all ITT routes) in each subject.

Table 2: Number of students by secondary core subject at postgraduate level

	Freq.	Target numbers 2015/16	Recruited teacher trainees 2015/16	percentage covered in the sample
Biology	699	1,178	1,050	67 %
Chemistry	637	1,053	1,003	64 %
Physics	506	1,055	746	68 %
Mathematics	1,637	2,581	2,407	68 %
Computer Science[37]	360	723	509	71 %
English	1,238	2,253	2,329	53 %
Languages	902	1,583	1,313	69 %
History	500	816	925	54 %
Geography	341	778	647	53 %
Total	6,820	12,020	10,929	

Almost a quarter of students in the sample study mathematics as an ITT specialist subject, another 18 percent are training to teach English. In total, half of the students

[36] A more detailed explanation of the procedure is provided in the Appendix.
[37] Computer Science was included in the analysis as it is one of those subjects with very high bursaries and which are high on demand.

are in sciences or mathematics, a percentage, which is also reflected in the OECD study *Education at a Glance*, where the UK is (together with India) the leader when it comes to the percentage of students studying sciences, mathematics or statistics (15 % in the UK, 6 % OECD average[38]). Table 3 summarises the bursaries available in 2015/16.

Table 3: Bursaries by subject and undergraduate degree class 2015/16

	Trainee with 1st/PhD	2i/Master's	2ii	Other
Biology	£15,000	£12,000	£10,000	£0
Chemistry	£25,000	£20,000	£15,000	£0
Physics	£25,000	£25,000	£15,000	£9,000
Mathematics	£25,000	£20,000	£15,000	£9,000
Computer Science[39]	£25,000	£20,000	£15,000	£0
English	£9,000	£4,000	£0	£0
Languages	£25,000	£20,000	£15,000	£0
History	£9,000	£4,000	£0	£0
Geography	£12,000	£9,000	£4,000	£0

Table 4 gives an overview of the gender and ethnicity of students in this particular sample for each of the subjects. In total, 2,778 of the students are male (41 %) and most of the students are of White ethnic background (80 %). Another 11 percent have an Asian ethnic background and 4 percent a Black or any other ethnic background.

The proportion of males and females vary by subject, with physics and computer science having the highest proportion of males studying the subject as ITT specialism (almost 70 %). Students studying English are, on the other hand mostly female (76 %). An almost perfect gender balance exists in history.

The largest variation in terms of ethnicity can be found in computer sciences with 65 percent White students, 10 percent of students having Black ethnic backgrounds and 19 percent of students having Asian ethnic backgrounds, while (more than) 90 percent of students studying for modern languages, history or geography are of White ethnic origin. There are also relatively high percentages of students having Asian ethnic backgrounds in biology (13 %) and chemistry (19 %).

[38] http://www.compareyourcountry.org/education-at-a-glance

[39] Computer science was included in the analysis as it is one of those subjects with very high bursaries and which are high on demand.

Table 4: Number of students by secondary core subject, gender and ethnicity

	Male	female	White	Black	Asian	other
Biology	264 (38 %)	435 (62 %)	77 %	4 %	13 %	5 %
Chemistry	232 (36 %)	405 (64 %)	71 %	5 %	19 %	4 %
Physics	342 (68 %)	164 (32 %)	83 %	2 %	9 %	5 %
Mathematics	801 (49 %)	834 (51 %)	73 %	6 %	17 %	4 %
Computer Science	247 (69 %)	113 (31 %)	65 %	10 %	19 %	6 %
English	291 (24 %)	947 (76 %)	84 %	3 %	9 %	4 %
Languages	223 (25 %)	679 (75 %)	90 %	2 %	3 %	5 %
History	243 (49 %)	257 (51 %)	92 %	1 %	4 %	3 %
Geography	135 (40 %)	206 (60 %)	95 %	1 %	2 %	2 %
Total	2,778 (41 %)	4,040 (59 %)	80 %	4 %	11 %	4 %

Having considered some aspects of the sample in this analysis the next section turns to look at measure of educational quality.

Recent use of ‘quality’ in policy

Over the last few years there has been a shift in what constitutes ‘quality’ in recruitment to ITT programmes and this change can be seen reflected in the structure of the bursary system. The association of bursary with degree classification in the earlier part of the decade signals undergraduate outcomes as the primary measure of quality for recruiting teacher training providers.

In 2011, the then Secretary of State, Michael Gove, published *Training our next generation of outstanding teachers: an improvement strategy for discussion* (DfE 2011a). The document set out action in three main areas, the first of which was to “raise the bar for entry to initial training: attracting more of the highest achieving graduates” which was linked to the second aim to “refocus government investment in teacher training so that it is effective in attracting and retaining in teaching more of the best graduates, especially in shortage subjects” (ibid). The move to equate degree outcomes with quality was based on the DfE’s internal analysis:

> …there is strong evidence that good subject knowledge of teachers is an important factor in the success of pupils. Analysis also shows that degree class is a good predictor of whether a trainee will complete their course and achieve Qualified Teacher Status. Therefore, from September 2012, the Department for Education will fund only trainee teachers who hold a second-class degree or higher. (DfE 2011a, 5)

What is meant by ‘subject knowledge’ here is not stated, though there is little doubt that knowledge of various kinds is very important for teaching. Although this move to higher

standards was welcomed by many, the problem of using non-standardised degree classifications as a baseline marker of quality is problematic. The *Implementation Plan* published later that year (DfE 2011b) set out the plan for bursaries for high priority specialisms: those with a First class degree would receive a £20,000 bursary whilst those with lower second-class degree would get £12,000 in bursary payments.

It is well known in England that despite the apparent comparability of an upper second-degree award from different HEIs, the strong filtering that happens upon entry to university means that not all degree outcomes are equal. Entry standards upon entry to university might well be a good predictor of the potential academic quality of teachers entering the profession three or more years later (see page 24).

International evidence suggests that teacher qualifications and their undergraduate degrees are not necessarily related to their effectiveness as teachers. A longitudinal study in Los Angeles, California, focusing on three types of teacher licensure tests as part of the teacher certification process, showed large differences between teachers and districts. However, teacher test scores were unrelated to teacher success in the classroom. Similarly, student attainment had no association with classroom teachers' degrees (Buddin & Zamarro, 2009). A similar analysis for Washington by Goldhaber, Cowan and Theobald (2017) shows that it is more likely to observe an effect of teacher performance test scores on students' mathematics achievements, but only in some specifications.

Harris and Sass (2011) studied the effects of training on the productivity of teachers in promoting student attainment. They found that elementary and middle school teacher productivity increases with experience (informal on-the-job training) but found no consistent relationship between formal professional development training and teacher productivity. There seems to be also no evidence that teachers' undergraduate training or college entrance exam scores are related to productivity. Eckert (2013) focuses on the measurement of teacher qualifications such as the number of education courses and the length of student teaching, but found that these measurements are unrelated to personal or general teacher efficacy, or feelings of confidence – an important requirement for being a good teacher.

Yet the association of quality and raised standards with degree outcomes remained clear through Mr Gove's tenure:

> More than 7 out of 10 new teachers now have a first or upper-second class degree, the highest proportion ever recorded and an increase of 9 percentage points since 2010 to 2011. (Gove, 2013)

This line was maintained by ministers for a few years. In 2016, when the DfE used this measure of quality, along with other indicators, to decide whether HEIs should have a more sustainable 3-year allocation of ITE places, some who had taken a more nuanced view of potential quality were left relatively worse off. For example, an

admissions tutor who accepted a student with A*AA at A level, and a lower second class degree from a leading high entry tariff (HET) university, would effectively be increasing the risk of negative consequences on DfE allocations. This view of quality has certainly affected the behaviour of some HEIs and no doubt had an impact on the ITE landscape though the precise extent of this effect is not easy to determine. That said, the growing concerns about recruitment shortfall meant that this was the last time that DfE allocations were in place for the vast majority of subjects and routes; the overriding concern was moving from quality to quantity.

Over the last few years, ministerial discourse has changed with HEIs that limited entrance to only those with at least an upper second-class degree being chastised for turning away potentially good teachers. In 2018, the Minister for Schools, Nick Gibb, was challenging teacher training institutions on their recruitment policies following news that 50,000 teacher training applicants had been rejected in previous year[40]. In an overdue move, the DfE clearly acknowledged that entry to ITT programmes should be on the basis of potential to become a good teacher, rather than denying access to training programmes based on a spurious predictor of teacher quality.

Whilst a move to a more holistic judgement about the potential of teachers to be effective by the end of their training is welcome, rather than whether they meet some arbitrary quality criteria before the start of their professional training, the bursary system has embedded some of this thinking about quality, particularly in the earlier years of the present decade. The narrowing of within-subject bursary payments in recent years indicates some recognition that differentiation in this way is probably unhelpful. Far more important is to use this public funding for between-subject differentiation and to attract teachers into shortage areas; though this too is not straightforward. This section of the report examines this issue of quality predictors in more detail.

[40] https://www.tes.com/news/exclusive-teacher-trainers-ordered-rethink-entry-standards-maximise-recruitment

Achievement measures and their interrelationships

When it comes to entrance into higher education, prior attainment is the means by which academic potential is judged. In England this is normally A levels (80 % of the sample), along with a more general measure of entry tariff. Bursary payments in ITT are based on degree outcomes as the primary measure of potential teacher quality. This section shows how using these two measures (i.e. A Levels and degree award) result in two different profiles of quality within the ITT cohort. This is turn raises questions about who is getting incentivised to enter ITT.

AS (Advanced Subsidiary) and A level qualifications (The General Certificate of Education Advanced Level) are indicators of attainment prior to university and are important for applying for a university as most higher education courses require specific A levels or combinations of A levels (or alternative level 3 qualifications). A fifth of the students in the sample did not have any A level qualifications[41], another 2 percent did one. Most of the students (45 %) had three A level qualifications and more than a quarter had achieved four. Based on their A level grades, students were classified into low, average and high attainers. High attainers are defined in this analysis as students with mostly As and better (e.g. AAB or equivalent and better). Average attainers are students having mostly B or C grades (e.g. ABB to CCD); all other students are labelled as low attainers (e.g. CDD and lower). This division is use, in part, because it divides the sample into three similarly sized subgroups.

Table 5: A level qualifications

	Number of A level qualifications			3 groups of A level qualifications	
	Freq.	Valid Percent		Freq.	Valid Percent
0	1,155	22 %	low attainers[42]	1,506	29 %
1	84	2 %	average attainers	1,820	35 %
2	215	4 %	high attainers	1,887	36 %
3	2,355	45 %			
4	1,404	27 %			
Total valid	5,213		Total valid	5,213	
Missing data	1,607		Missing data	1,607	
Total	6,820		Total	6,820	

[41] They may have had a range of other qualifications with as the International Baccalaureate or BTEC

[42] This group includes students with A level qualifications below C grades and also students without A level qualifications. Interesting is that the group of low attainers did more qualifications in addition to A level qualifications than average attainers.

Not all students have A levels, so the UCAS Tariff points are used to measure "the relative value of all post-16 qualifications in the UK." Possible grades that can be achieved in qualifications are translated into a numerical score. This score is important when applying to universities and courses. Entry requirements for one of the top 25 UK universities in 2015 were for example between 437 tariff points (University of Nottingham) and 614 (University of Cambridge).[43]

Higher education institution and degree class

One possible way of distinguishing between ITT students is whether the institution they are studying at has a high entry tariff (HET)[44]. Whilst this approach is problematic, it does resonate with the intentions of ministers to use signals of quality – whether correct or not – as a basis for improving the teaching profession. Most of the students in the sample (69 %) did not attend a HET university at undergraduate level, nor do they during their postgraduate studies (67 %).

Table 6: Institution attended at undergraduate and postgraduate studies

	Undergraduate institution		Postgraduate institution	
	Freq.	Valid Percent	Freq.	Valid Percent
HET university	3,604	69 %	4,542	67 %
Other university	1,609	31 %	2,278	33 %
Total	5,213	100 %	6,820	100 %

Figure 10 shows the flow of students, with a quarter of ITT students who completed undergraduate degrees at a non-HET undergraduate institution moving to a HET university. Nearly half (45%) of those in the sample who completed their undergraduate studies at an HET institution move to a non-HET for their teacher training, although only 15 of the HET universities host postgraduate ITT programmes.

[43] www.thecompleteuniversityguide.co.uk; In 2018 the amount of points given for a specific qualification changed. For example, an A grade at A levels, which was worth 120 tariff points is now worth 48 points. This report focuses on the old system of tariff points.

[44] Although problematic, we have assumed a general principle that the HET of 24 research intensive comprise this group (https://russellgroup.ac.uk/about/our-universities/). This is clearly not the case for every institution, discipline or student but is sufficient to illustrate a key point of our analysis. We are not suggesting that the quality of teachers produced in one kind of organisation is better that another. All of these institutions feature in the Sutton Trust 30 grouping of highly selective universities (where it was estimated that less than 10 per cent of places are attainable to pupils with 200 UCAS tariff points or less) (Sutton Trust 2011). www.suttontrust.com/wp-content/uploads/2011/07/sutton-trust-he-destination-report-final.pdf

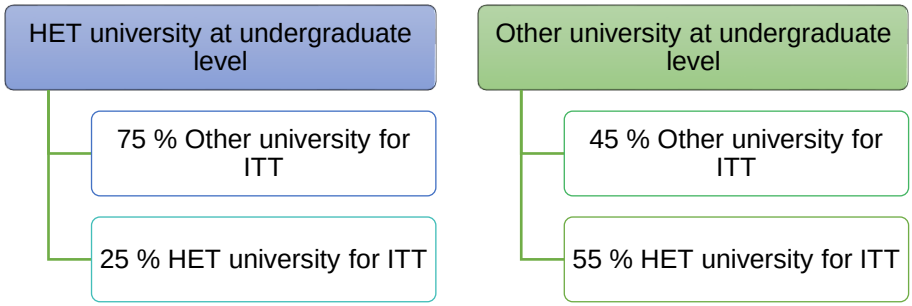

Figure 10: Flow of students

Degree classification

Figure 11 shows percentages for the sample of 6,820 students studying ITT specialism. More than half of the students in the sample achieved upper second-class Honours degrees, another fifth of the students received a first class degree. This is comparable with the share of degrees awarded by all UK undergraduates 2015/16 (see Fig. 1 above).

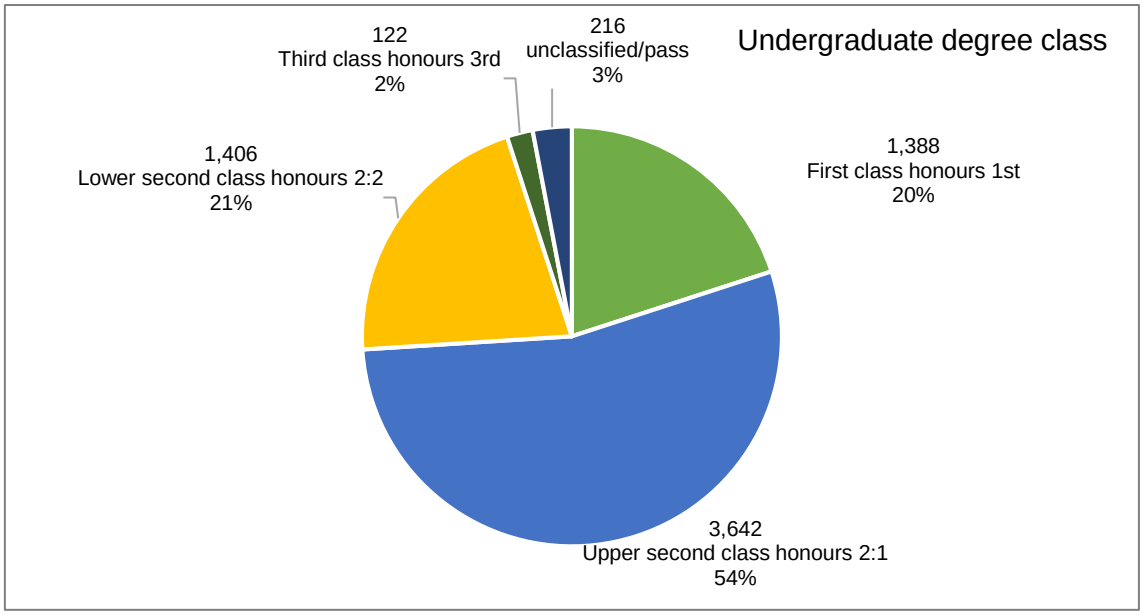

Figure 11: Undergraduate degree class

The degree classifications profiles for teacher trainees who obtained their undergraduate degrees in HET or non-HET institutions is broadly similar as shown in Table 7 with the majority of trainees having first studies outside of the HET.

Table 7: Undergraduate degree class by institution attended

	HET university		Other university	
	Freq.	Valid Percent	Freq.	Valid Percent
First	317	6 %	778	15 %
2i	964	19 %	1,937	37 %
2ii	260	5 %	764	15 %
3rd	35	1 %	52	1 %
pass	30	1 %	63	1 %

Of the whole sample, 15% achieved a first class honours degree at a non-HET university; around two and a half times the number with a first from a HET university. Over a third (37%) achieved a 2i at a non-HET university, around twice as many as those with a 2i from a HET. 20% of the students have a 2ii but three times as many are from non-HET than from HET universities.

Undergraduate degree class and A-levels

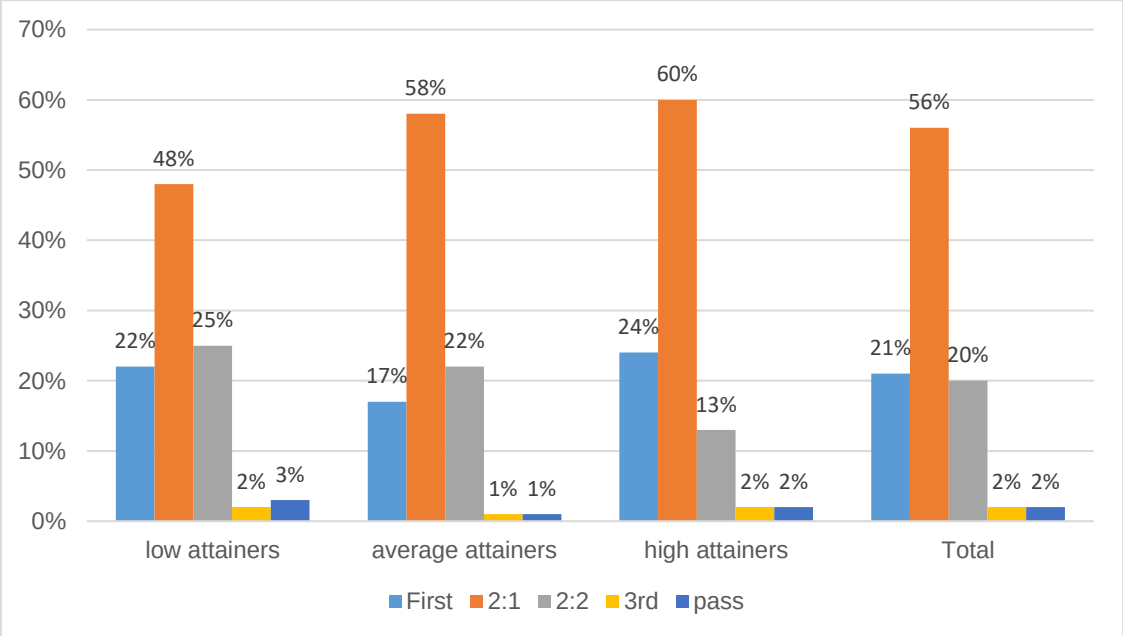

Figure 12: Undergraduate degree class by A level attainment

70 percent of low attainers as defined in the sample, received at least a 2i undergraduate degree. A quarter of them achieved a lower second class honour. 75 percent of students with average attainment at A level received at least a 2i undergraduate degree. Only 17 percent of them achieved a first class honours degree. 86 percent of students who were high attainers at A level received a least a 2i undergraduate degree and 24 percent were awarded with a first.

Although those with higher tariff upon entry to HE are slightly more likely to achieve first or 2i degrees, the differences are not what one might expect. The chart shows

broadly similar distributions of degree classifications for each of the three groups of HE entrants. What the dataset does not include is the profile of all undergraduates in each of these attainment groups. The majority of those receiving the highest bursaries did not attain high grades at A level and many of those in the cohort with the highest grades at A level are in receipt of bursaries at lower level than their lower attaining (at A level) peers.

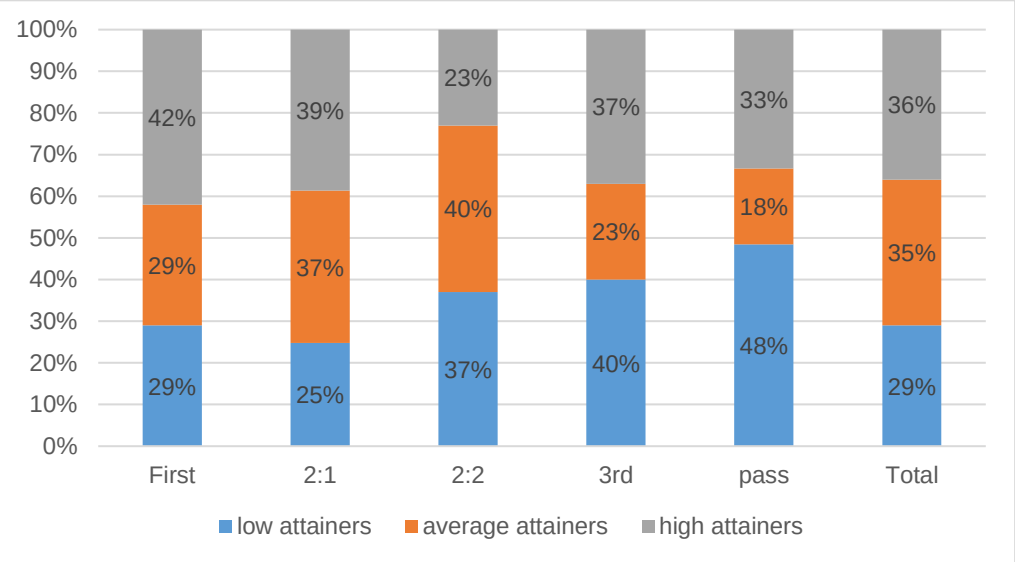

Figure 13: A level attainment by undergraduate degree class

Figure 13 illustrates this in another way. Of those who attained a first class degree, nearly 60% were from the middle and low attaining A level groups, and over a third of those with 3rd class degrees had the highest A level grades.

The main driver of this situation is that undergraduate degrees are not standardised across Higher Education Institutions (HEI). The following figures (14 & 15) combine A level attainment, the undergraduate degree class and the type of HEI the students attended at undergraduate level. It is important to remember that this is an analysis of our HESA sample.

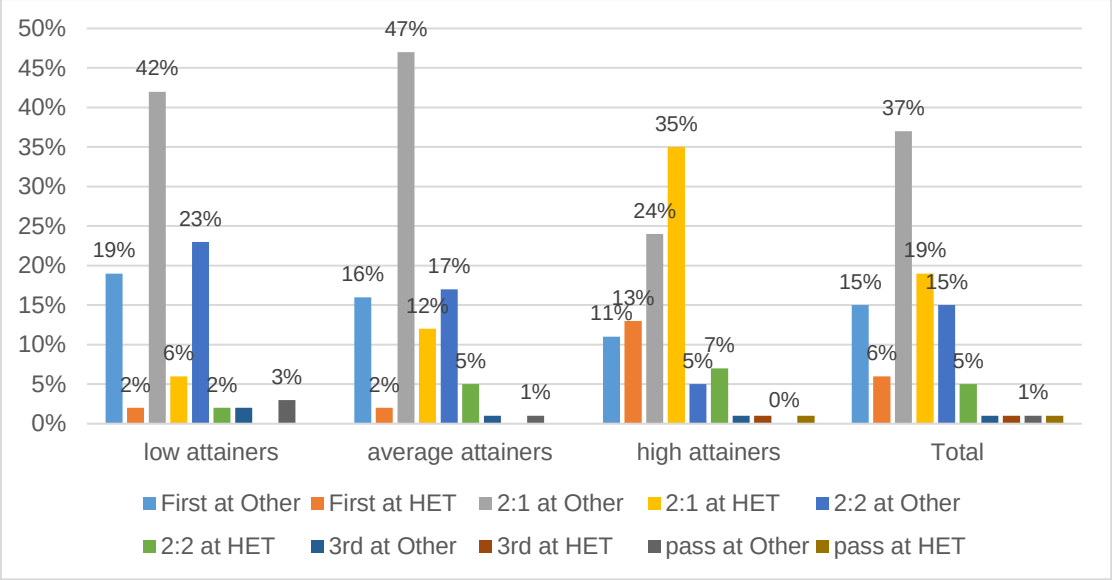

Figure 14: Undergraduate degree class by A level attainment and HE institution

High attainers at A levels are more likely to have studied at a HET university than non-HET. Middle and lower attaining A level students are much more likely to have studied outside of the HET. Figure 15 shows this data in a different way and there is a clear distinction between students in HET and non-HET universities.

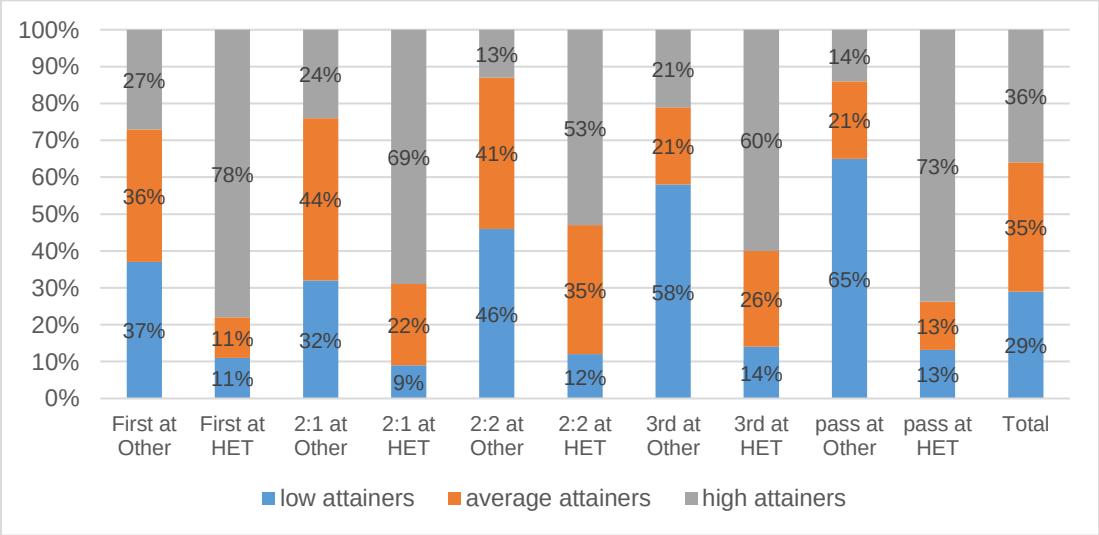

Figure 15: A level attainment by undergraduate degree class and HE institution

Students in HET universities are most likely to be high attainers already at A level stage. Only 11 percent of low attainers and average attainers in this sample were able to attain a first degree at a HET university, while 37 percent of low attainers and 36 percent of average attainers did so at a non-HET university. This is to be expected but

the analysis does highlight the problem of assuming degree outcomes as the primary measure of potential quality.

This analysis can also be on the basis of UCAS tariff points. Figure 16 shows once again that there is not a great deal of difference in tariff for those attaining the different degrees; degree outcome might not be a good differentiator of academic quality. This is largely due to the fact that tariff filters students into different cohorts in different types of universities. Then, within those cohorts there is a distribution of within-cohort grade outcomes.

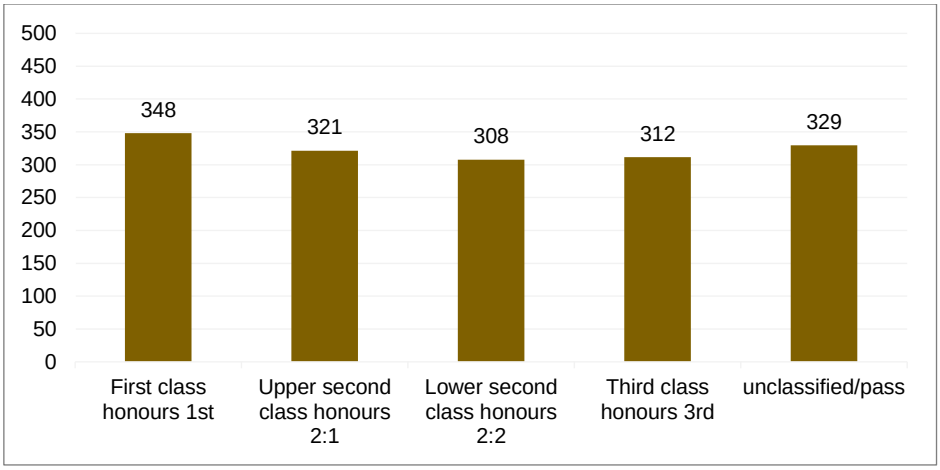

Figure 1616: Tariff points by undergraduate degree class

Summary

Bursaries for studying specific subjects are awarded on the basis of undergraduate degree class. However, due to the nature of the English higher education degree classification system, such a measure is a poor means by which to differentiate potential quality of ITT students. In fact, it might be over-rewarding lower-attaining A level students who happen to have been top of their class of undergraduates. Meanwhile, this cohort might be missing a tranche of high attaining A level students who, because someone must be, achieved lower degree classifications and were thereby disincentivised from starting an ITT course.

Subject related content

This section extends the previous analysis into the core subjects English, mathematics, science, modern languages, history and geography. In addition to these secondary core subjects, computer science is considered. As the bursaries vary by subject studied it is instructive to consider the distribution of degree classification and institution type amongst each subject cohort.

Achievements of students before entering university

A level achievements have a filtering function in access to university and Figure 17 shows the differences in A level achievements in the sample of secondary trainees by subject.

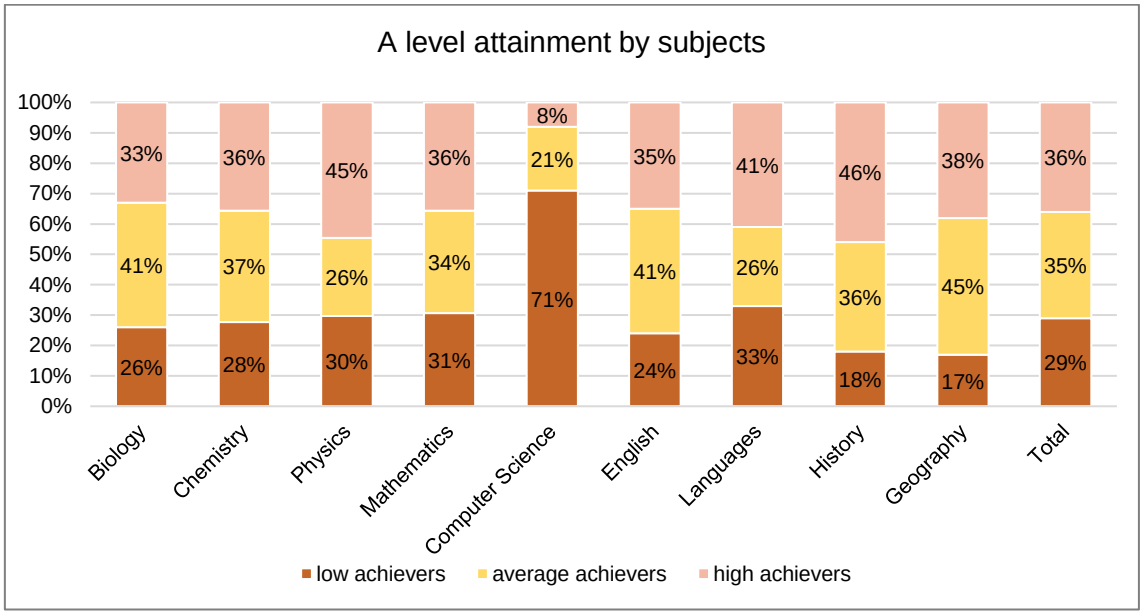

Figure 17: A level attainment by subjects

71 percent of students who study computer science were low attainers at A level and only 8 per cent of them belong to the group of high attainers. This group seems to be distinctive from the rest of the sample. However, it is not possible to tell what other qualifications they have aside from A level qualifications so this column should be treated with some caution. The lack of formal qualifications is not surprising as the relatively low formal qualification of teachers in computer science is already addressed by government. Initiatives such as the establishment of a National Centre for

Computing Education is aiming to upskill 8,000 computer science teachers by the end of the parliament.[45]

At the other extreme, for ITT students in physics, history and languages, over 40 per cent of students are high attainers at A level. These are the first indicators (besides demographics) that there are differences between students by subject.

The tariff points earned by students before entering university also suggest that there are differences. Students in physics have earned 428 points on average, followed by students studying a modern language (403 points) and history (398 points) ITT programme. Students in computer science have an average of 306 tariff points earned.

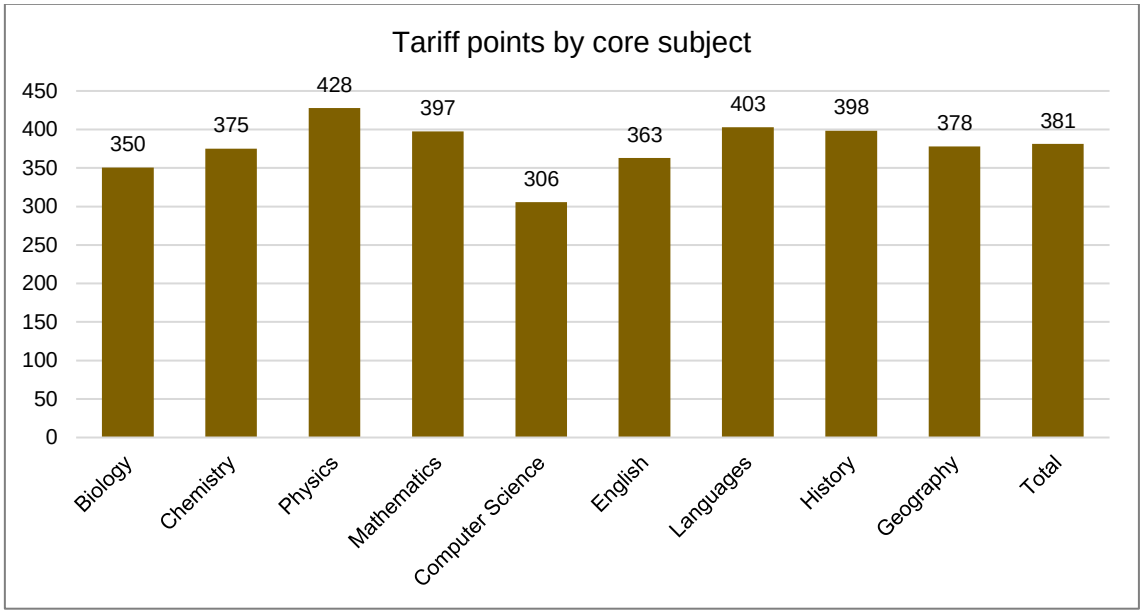

Figure 18: Tariff points by core subject

The previous section already highlighted the relationship between the possibilities of earning good degrees and the institution attended. Figure 19 gives information about the undergraduate degree achieved by students in different subjects.

[45] https://www.gov.uk/government/news/schools-minister-announces-boost-to-computer-science-teaching

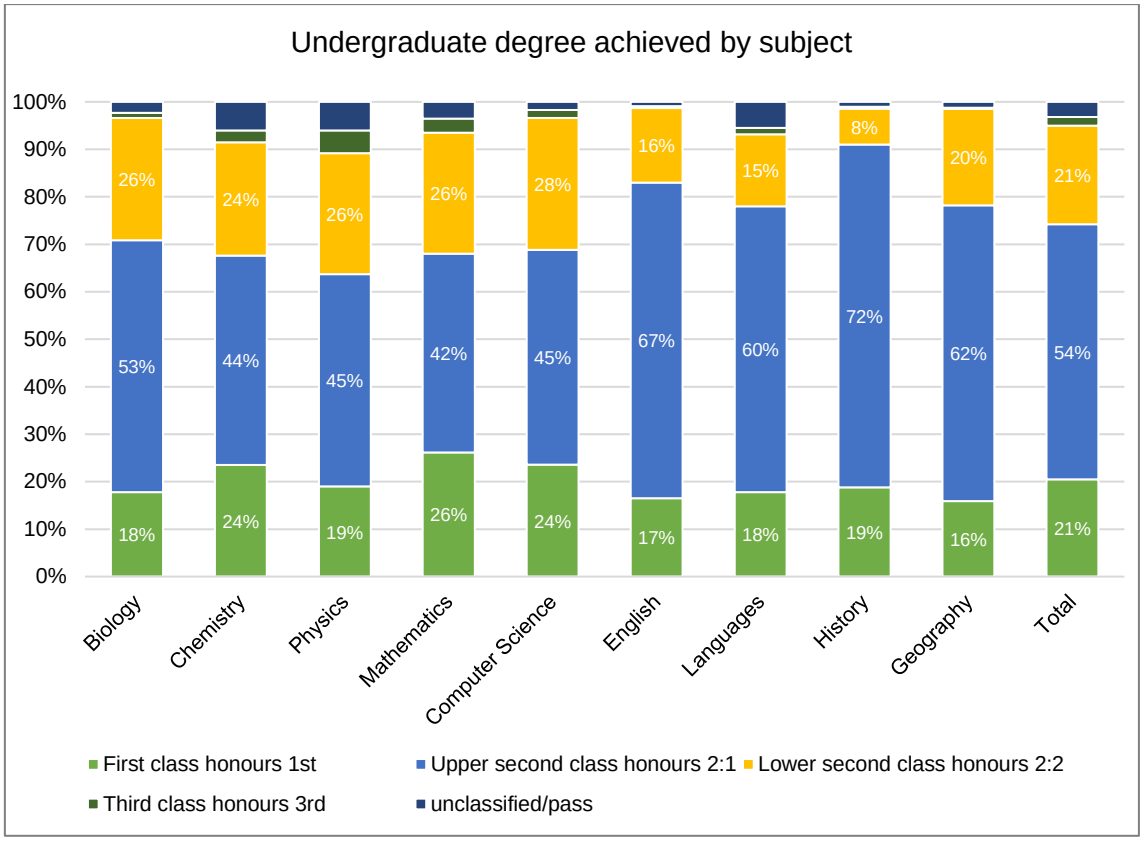

Figure 19: Undergraduate degree achieved by subject

The distribution of undergraduate degrees in the sample is 21% of first class degrees, 54% of upper second class degrees, 21% of lower second class degrees, 2% of thirds and 3% of passes. A very high percentage of students in history (91 %) achieved a First or a 2i at their undergraduate studies. Also the percentages for English (84 %), modern languages (78 %) and geography (78 %) are remarkably high. There are only 64 percent of students in physics with a first or upper second class honours degree, however, most of them have achieved it at a HET university

Summary

There are differences in attainment levels between students studying an ITT secondary core subject at postgraduate level. These differences already exist before entering university as A level achievements for prospective physics teachers are significantly higher than those of computer science students for example. The same is true for earned tariff points.

Conclusion

In times of accountability regimes and of highly competitive international and national assessments, many countries feel the need to improve their education system, their schools and, in particular, the quality of teachers and teaching. Initial Teacher Training is therefore an important area of government policy in contemporary society. It is important to get the best candidates and therefore the best teachers and yet many countries face significant challenges in recruiting sufficient number of high quality teachers particularly in some areas.

One approach to this problem, as piloted in England, has been to give bursaries to teacher trainees based on market need and undergraduate qualification. Bursaries appear to serve as an incentive for starting initial teacher training in some subjects though the relationship between bursary, target and recruitment is far from clear and varies by subject.

The competition for science undergraduates is high which, when combined with the ongoing strength of the STEM agenda, has resulted in continually high bursaries for mathematics and science. This reflects current values in government. However, the question remains if these bursaries really attract more students and students with the potential to become the best teachers. This analysis suggests that a bursary system based on the undergraduate degree outcome might, counterintuitively, not be that useful in supporting the goal of raising teaching quality.

The analysis suggests that bursaries based on undergraduate degree class might act as a ‘pull’ to those with high degree classifications and lower tariff and from lower ranking universities and a ‘push’ to high tariff student from high-ranking universities but with lower degree classifications. Most institutions award a broadly ‘normal’ distribution of degree grades so the early bursary policy is tending to bias the recruitment of ITT recruits to the upper part of the degree distribution, irrespective of prior attainment. This is an unintended consequence of the policy.

The analysis leads to the conclusion that not distinguishing between students by their undergraduate degree would be better and this has indeed been the direction of travel: students now receive the same amount of bursaries (except history, religious education, music and design & technology), regardless of their undergraduate degree being a first or second class honours degree.

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Appendix

This appendix provides an overview on the data reduction procedure in detail.

The whole data set includes students in subject areas allied to medicine, biology, agriculture, physical sciences, mathematics, computer sciences, social studies (which includes geography), business & administrative studies, languages, historical & philosophical studies, creative arts and design as well as education.

Three postgraduate subject areas are included in the data set. The following tables are referring to the postgraduate subject area 1. There are only 23 students in the subject area of biology who aim for a doctorate or Master's degree. In addition, 48 students in Mathematics aim for a Master's degree. All other students of interest anyway aim for a PGCE or PCDE, which is why the decision was made to include only students aiming for a PGCE/PGDE in the data set. This reduced the number of students to 20,666.

Table 8: General qualification aim of the course

		Subjects allied to Medicine	Biology	Agriculture and related subjects	Physical Sciences	Mathematics	Computer Sciences	Social Studies	Business & Administrative Studies	Mass Communication & Documentation	Languages	Historical and Philosophical Studies	Creative Arts and Design	Education
Doctorate degree that meets the criteria for a research-based higher degree	36		23											13
Master's degree obtained typically by a combination of coursework and thesis/dissertation	3,788	36	1			48			16				4	3,683
Masters in Teaching and Learning	41													41
Post-experience taught Master's degree	262													262
Diploma at level M	252													252
Certificate at level M	604													604
Professional taught qualification at level M other than Master's degree	170													170
Postgraduate Certificate in Education or Professional Graduate Diploma in Education	20,666		1,684	13	1,143	1,637	361	610	133	22	2,160	798	1,234	10,870
Post-registration education qualification at level M other than master degree for serving schoolteachers	1,547													1,547
Post-registration health and social care qualification at level M	22													22
Level 7 Diploma in Teaching in the Lifelong Learning Sector	70													70
Other taught qualification at level M	2,719	242				33								2,444
taught work at level M for provider credit	199							2						197
Total	30,376	278	1,708	13	1,143	1,718	361	612	149	22	2,160	798	1,238	20,175

The following table shows the teacher training routes to a teacher training qualification in the whole data set and by subject area. Most of the students are on initial or pre-service teacher training course leading to Qualified Teacher Status or to registration as a school teacher with the General Teaching Council for Scotland (12,841), on an inset course (8,567) or in a School Direct Programme (5,008).

Table 9: Training route to a teacher training qualification in the whole data set.

		Subjects allied to Medicine	Biology	Agriculture and related subjects	Physical Sciences	Mathematics	Computer Sciences	Social Studies	Business & Administrative Studies	Mass Communication & Documentation	Languages	Historical and Philosophical Studies	Creative Arts and Design	Education
Not a teacher training course	45													45
On initial or pre-service teacher training course leading to Qualified Teacher Status or to registration as a school teacher with the General Teaching Council for Scotland	12,841		1,249	13	895	1,242	269	459	114	14	1,538	521	849	5,678
On other initial teacher training course not leading to Qualified Teacher Status nor to registration as a school teacher with the General Teaching Council for Scotland	3,135	278												2,857
Inset course	8,567		1			81		2	16		6		4	8,463
NCTL funded flexible provision (ITT)	107		1		5	13		1					3	78
Other NCTL funded provision not elsewhere specified	392		23											369
School Direct Training Programme	5,008		434		243	382	92	139	19	8	616	277	382	2,415
Early Years Initial Teacher Training	281							11						270
Total	30,376	278	1,708	13	1,143	1,718	361	612	149	22	2,160	798	1,238	20,175

After reducing the data set to students aiming for a PGCE/PGDE, the distribution of the 20,666 students in teacher training routes shows as follows.

Table 10: Training route to a teacher training qualification in reduced data set

		Biological sciences	Agriculture & related subjects	Physical sciences	Mathematical sciences	Computer science	Engineering & technology	Social studies	Business and administrative studies	Mass communications & documentation	Languages	Historical & philosophical studies	Creative Arts & Design	Education
On initial or pre-service teacher training course leading to Qualified Teacher Status or to registration as a school teacher with the General Teaching Council for Scotland	12,841	1,249	13	895	1,242	269		459	114	14	1,538	521	849	5,678
On other initial teacher training course not leading to Qualified Teacher Status nor to registration as a school teacher with the General Teaching Council for Scotland	2,413													2,413
inset course	48													48
NCTL funded flexible provision (TT)	17	1		5	13			1			6		3	78
School Direct Training Programme	5,008	434		243	382	92	1	139	19	8	616	277	382	2,415
Early Years Initial Teacher Training	249							11						238
Total	20666	1684	13	1143	1637	361	1	610	133	22	2160	798	1234	10870

All students aiming for Qualified Teacher Status (QTS) and in a School Direct Training Programme are still included in the data set. The number of students not aiming for QTS reduced from 3,135 to 2,413 (students in Education). The number of students in inset courses reduced from 8,567 to only 48 students (students in Education).

The next question was whether the subject is studied as an ITT specialist subject. For this purpose, all three postgraduate subject areas were taken into account. The following table shows that for 71 students the question of ITT specialism was not applicable. 2,488 students study the subject not as an ITT specialist subject (11 of the in Social Studies). The rest studies at least one of a maximum of three subjects as an ITT specialist subject. This reduces the number of students in the sample to 20,107 students.

Table 11: ITT subject specialism in the reduced data set

		Biological sciences	Agriculture & related subjects	Physical sciences	Mathematical sciences	Computer science	Engineering & technology	Social studies	Business and administrative studies	Mass communications & documentation	Languages	Historical & philosophical studies	Creative Arts & Design	Education
not applicable	71													71
no subject specialism	2,488							11						2,477
One subject as ITT specialism	17,752	1,641	13	1,096	1,588	361	1	584	133	10	2,003	798	1,227	8,297
one subject as specialist subject and another with no ITT specialism	107	14		10				3	0	12	52		2	14
Two subjects as ITT specialism	227	14		37	49			12			99		5	11
Three subjects as ITT specialism	21	15									6			
	20,666	1,684	13	1,143	1,637	361	1	610	133	22	2,160	798	1,234	10,870

The final decision was made to focus only on the secondary core subjects *Physics, Chemistry, Biology, Mathematics, English, Languages, History* and *Geography*. Students in *Computer Sciences* were added because of the subject being a high demand subject and students receiving high bursaries.

There are diverse actual subjects in the different subject areas, which means that not all students studying in a subject area were included, but only those who study the actual subject. The selection was done based on the main subject.

Table 12: Subjects within the subject area

Biological sciences		Social Studies		Languages		Historical and Philosophical Studies	
C1 Biology	686	L1 Economics	38	Q3 English studies	1,238	V1 History by period	500
C6 Sport & exercise science	884	L2 Politics	73	Q6 Latin studies	36	V6 Theology & religious studies	298
C8 Psychology	101	L5 Social work	18	Q8 Classical studies	20		
C9 Others in biological sciences	13	L7 Human & social geography	341	R1 French studies	341		
		L9 Others in social studies	140	R2 German studies	57		
				R3 Italian studies	2		
				R4 Spanish studies	137		
				R9 Others in European languages, literature & related subjects	329		
Total	1,684	Total	610	Total	2,160	Total	798

- Biological sciences: Students doing Sport & Exercise Science as well as students in Psychology were excluded from the analysis, which left us with 699 students doing Biology as their main ITT specialist subject.
- Physical sciences: The subject area of physical sciences includes 637 students in Chemistry and 506 students in Physics who were kept in the final data set.
- Mathematics: All 1,637 students in Mathematics were kept in the data set
- Computer Science: From the original 361 students studying in the Computer Science subject area, one students is in Information Systems, which is why the person was excluded from the analysis.
- Social Studies: The subject area of social studies consists of students in economics, politics, and social work, human & social geography. Only the 641 students in Human and Social Geography were kept in the final data set.
- Languages: The subject area of Languages was separated into 1,238 students studying English and students studying modern languages. The 20 students doing Classical studies were excluded from the analysis
- Historical and Philosophical Studies: In this subject area students in theology & Religious studies were excluding, leaving 500 History students in the final data set.

The final sample numbers and percentages of students in different teacher training routes are shown in the following table:

Table 13: Final data set

	Freq.	On initial or pre-service teacher training course leading to Qualified Teacher Status or to registration as a school teacher with the General Teaching Council for Scotland	NCTL funded flexible provision (TT)	School Direct Training Programme
Biology	699	84 %	0 %	16 %
Chemistry	637	77 %	0 %	22 %
Physics	506	80 %	1 %	20 %
Mathematics	1,637	76 %	1 %	23 %
Computer Science	360	74 %	-	26 %
English	1,238	63 %	0 %	37 %
Languages	902	82 %	0 %	17 %
History	500	53 %	-	47 %
Geography	341	75 %	0 %	25 %
Total	6,820			