Education statistics briefing

This briefing accompanies Reform Scotland's education statistics spreadsheet

Scotland needs to establish an independent body, similar to the ONS, to oversee the collection and analysis of education data in Scotland

Education is, understandably, an emotive policy area within which there will always be disagreements. However, there should be a solid foundation of factual information that allows constructive discussion to take place. Unfortunately, no such foundation exists.

Our Commission on School Reform has commented that "we know less now about the performance of Scotland's schools than at any time since the 1950s".[1]

Without key information, how are we to properly assess the impact of different policies on educational outcomes?

In short, we cannot.

The Scottish Government has asked Professor Hayward to review assessment and certification arrangements in Secondary schools. Reform Scotland believes that in order for any review to be effective, it must learn from past experience and be able to review its own progress. To do this improvements must be made to data collection and analysis.

We cannot possibly consider creating a new assessment system when we have little idea of the impact of the last change to exams.

The Scottish Government should create an independent body, similar to the Office for National Statistics, to oversee the collection and analysis of educational data in Scotland and improve the evidence base for education policy.

Reform Scotland would urge the Scottish Government to adopt the following policies proposed by the Commission on School Reform to improve the quality of education data in Scotland:

- **An independent body similar to the Office for National Statistics should be established to oversee the collection and analysis of statistics and data on Scottish education.**
- **Scotland should re-join the international TIMSS and PIRLS studies and consider whether there are other useful options for improving our knowledge of how performance in Scotland compares with elsewhere.**

[1] CSR-Challenge-Paper-reliable-data-December-2019.pdf (cloudwaysapps.com)

- **Building on the experience of the now-defunct Scottish Survey of Literacy and Numeracy and its predecessors, a new sample survey of performance in key areas of the curriculum at several stages of primary and early secondary education should be reintroduced.**
- **Better use should be made of the existing good-quality standardised tests by introducing consistency into the way in which they are administered with a view to obtaining data which has much greater validity.**
- **Educational innovations should be systematically and independently evaluated with findings being widely shared.**

Background

In 2016 Reform Scotland first published research[2] highlighting the decline in the number of subjects pupils were able to study in fourth year. While seven or eight Standard Grades had been the norm, under the new exam system pupils were generally studying only about six National 4s or 5s, with some schools were offering as few as five. The variation in number was based purely on the school attended or the local authority, not on the pupil's ability.

In 2019 we re-examined the issue.[3] The variation across and within local authority areas had worsened, with fewer state schools allowing pupils to study eight subjects in S4. And while a minority of Scottish state schools still allow pupils to study more than six subjects, independent schools continue to enable pupils to sit eight or nine.

While the data, based on Freedom of Information requests to councils, confirmed the reduction in subject choice in S4, the information published by the SQA made it near impossible to draw any conclusions as to what impact this change has had in terms of overall attainment. The same is true when attempting to compare schools which reduced choice to those which had not. And while there may have been marginal improvements in some national outcomes, it was not clear what impact the independent sector had on those changes. In short, a major change had occurred in assessment and there was little if any analysis as to the impact.

Unfortunately, the lack of data and analysis around exams is only one example of data inadequacy. Other issues include:

- The decision to abandon the Scottish Survey of Literacy and Numeracy (SSLN) after the 2016 survey, which assessed performance in P4, P7 and S2.
- Despite the introduction of Scottish National Standardised Assessments, the findings of the assessments are not published and the data that is made publicly available by government consists of the judgments made by individual teachers, having taking into account the outcomes of the assessments among other factors.

[2] https://reformscotland.com/2016/05/national-4s-and-5s-unintended-consequences/
[3] National 4s & 5s: The accidental attainment gap - Reform Scotland

- The Scottish Government removed Scotland from the Third International Mathematics and Science Survey (TIMSS) and the Progress in International Reading Literacy Study (PIRLS). PISA is now the only international survey of how standards in Scottish education compare with other countries.

Subject-specific policies, such as 1+2 in terms of expanding language learning by the end of primary school and the Logan Review's highlighting of the importance of computing education, also require additional data to fully understand the impact of such initiatives, identify delivery problems, if they exist, and to measure successes.

The purpose of this briefing and accompanying data sets is not to answer these questions, but rather to highlight the gaps and provoke debate in order to improve the education data landscape. There are simply too many unknowns.

Our statistics

These statistics have been compiled using the SQA publications archive and Freedom of Information Requests and generally cover the period 2000 to 2019, 2019 being the last year unimpacted by the pandemic.

During this period Scotland had three types of exams sat predominantly in S4 – Standard Grades, Intermediates and Nationals. Each of these exams operated differently, enabled different progression to Higher and took in a different proportion of pupils in later years.

For example, under the Standard Grade system around 96% of candidates were in S4. Under the National 5s this falls to about 77% as a number of pupils sit National 5s in later years of school as well. This has an impact on the average number of entries as pupils in later years will likely be only sitting one or two National 5s. In addition, while we know the overall number of entries at Standard Grade, we don't know the breakdown by Credit, General and Foundation papers, which would in turn result in awards at different SCQF.

Although credit awards in the former would be comparable to passes in the latter, a General pass at Standard Grade would often allow for progression directly to a Higher course, whereas that progression from National 4 straight to Higher cannot be done.

As a result, comparisons beyond the reduction in subject choice are largely meaningless at this stage.

In addition to the changing exam system in S4, over the same period Scotland has used three versions of Highers, with four years operating two versions at once, and in 2015 three versions of Higher science exams were sat.

These caveats highlight just how difficult it is to consider exam data over this period. But it also emphasises how little we know of the impact caused by the last change to exams in Scotland.

In the absence of more detailed data published and analysed centrally, we do believe the available statistics highlight some interesting trends which merit further discussion and analysis if we are to fully understand the previous changes to Scotland's examination system - analysis which should be done before any future change.

Where we have looked at subject choice, we have not examined all subjects, but have focused on 17, which are ordered in each table by how many pupils sat each at Higher in 2019 (English being the most popular, German the least).

Contents:

The document contains the following datasets:

1	Compiled using SQA data archive	SGrade /Nat 5 entries & awards	This looks at the change in time in the average number of entries and awards for candidates sitting Standard Grades (for both Credit and Credit & General awards) and National 5s 2000-2019.
2		Subject choice at SG/Nat 5	This table looks at the change in subject choice at Standard Grades, Intermediate 2s and National 5s from 2000 - 2019
3		Change in Higher entries	This looks at the change in the average number of entries and awards for candidates sitting Highers, 2000-2019. For 2000-2002 both sets of Highers sat are included, similarly in 2015.
4		Subject choice at Higher	This table looks at the change in subject choice at Higher level, 2000-2019. To ensure comparing like with like, Highers, New Highers (2000), Revised science Highers (2012-15) and New Highers 2 (2015) are all included
5	FOI	Selected subject choice at Higher	The number of candidates, and as a percentage of the total number of candidates in S5 in a)state schools b) independent schools, achieved 1, 2 ,3, 4, or 5 Highers passes from subjects from a set list, 2002-2021
6		Avg SG/Nat 5s by sector	The average number of Standard Grades and National 5s sat between 2002 and 2021, broken down by state and independent sector
7		Higher Maths awards by sector	Number & proportion of Higher Maths awards at each grade 2002- 2021, broken down by state and independent sector
8		Number sitting three sciences in S4	Number of candidates and percentage of the total in S4,that achieved passes in Physics, Biology, and Chemistry broken down by state and independent sector, 2002-2021.
9	Scottish Government	Highest leaving attainment	Percentage and number of school leavers by highest SCQF Level achieved, 2009/10 to 2019/20

Points of interest:

S4 exams

As mentioned, the hugely different way that the three types of exam systems operate mean that it is impossible to offer any meaningful commentary. However, there are some points that can be noted with regard to the number of subjects being studied as well as comparisons between the state and independent sectors:

- There has been a huge drop in the number of pupils entered for eight subjects, from 38,467 sitting 8 Standard Grades in 2000 to 3,441 sitting 8 Nat 5s in 2019. (It is worth noting that as National 5s are also sat in S5 and S6, potentially some of this number could be pupils in later years.) The number sitting seven or eight has fallen from 53,957 to 12,351.
- There has been a drop in the number of pupils gaining seven or eight awards in S4, including only Credit awards where the figure has fallen from 13,808 to 8,970. (Again, the latter could include pupils not in S4). Including Credit and General the number gaining seven or eight awards has fallen from 38,052 to 8,970.
- The decline starts around 2005, so pre-dates the introduction of Curriculum for Excellence, but could be connected to the increase use of Intermediates at that time.
- Due to the different SCQF levels covered by different Standard Grade papers, it is difficult to accurately highlight trends in subject choice in S4 over the 20-year period. However, there are some trends that can be noted by looking at only at National 5 entries, introduced in 2014.
    - Physics: Entries for physics have gradually declined since 2014.
    - Social subjects: History and geography entries have gradually declined since 2014.
    - Languages: French and German have both seen a decline in entries while Spanish had gradually increased.
    - Art & Design: Entries have declined since 2014.
    - Computing: Entries have gradually declined.
- There is a big gap in attainment between the state and independent sectors. In 2019 the average number of National 5 entries per learner in S4 in the state sector was 5, with an average of 4.4 awards. For the independent sector it was 7, and 6.8 awards.
- Despite the decline in entries in S4, there has not been a decline in the number and percentage of state pupils achieving awards in three sciences. In fact, there has been a slight increase from 2.4% in 2002 to 3.6% in 2019. However, while in state schools the percentage of candidates taking 3 sciences has increased by just over 1%, in the independent sector over the same period the percentage increase has been 5 times higher at 6.4% - the proportion of pupils in the independent sector achieving awards in three sciences in S4 has increased from 18.1% to 24.5%.
- Since 2014, 14-15% of school leavers depart with National 4/SCQF 4 as their highest level of attainment, meaning that they have not sat an external exam.

The levels were similar under the previous system, though external exams were sat at General and Foundation level for Standard Grade.

- Over one fifth of school leavers each year leave with National 5/SCQF5 as their highest level of attainment. The reduction in subject choice in S4, as well as any changes to this tier of exams, will therefore have a big impact on a significant minority of pupils.
- The Nationals examination system allows pupils to sit these exams in later years. For most of the subjects we looked at, 80%+ of candidates were in S4, with only 1-3% in S6. Maths was an exception to this. In 2019, 64% of pupils were in S4, 23% in S5 and 10% in S6.

Highers

- The number of entries and awards per learner at a Higher level has remained relatively stable since 2000. The proportion of Higher candidates in 5th and 6th year has also remained stable between 2000 and 2019.
- Since 2006 there has been a steady increase in the number of pupils gaining 5 awards.
- There has been an increase in the number of A grades per learner from 0.6 to 0.8.
- There has been a steady increase in the number and percentage of candidates getting 5 As from 1,258 (2.1%) in 2003[4] to 2,597 (4.1%) in 2019. The number gaining 4 As rose from 1,444 (2.4%) to 2,058 (3.2%).
- For most Highers, entries in each subject have remained relatively stable over the period, with minor fluctuations up or down, though certain subjects have seen bigger changes:
    - PE: In 2003 there were 4,095 entries for Higher PE, representing 6.9% of candidates. This has increased consistently over the period and by 2019 there were 9,896 entries representing 15.5% of candidates.
    - Science: There have been gradual on-going declines in entries in Physics (9,489 & 16% of candidates in 2003 to 8,327 and 13% of candidates in 2019) and Biology (8,920 & 15% of candidates to 7,686 & 12% of candidates). Though Chemistry remains stable (9,292 & 16% to 10,047 & 16%), Chemistry overtook Physics in 2005 as the more popular of the three sciences.
    - Business Management has gradually increased from 5,977 and 10% of candidates in 2003 to 8,322 and 13% in 2019.
    - Social sciences: History has increased, Modern Studies remained stable and Geography has declined in popularity.
    - Creative: Music and Drama have increased in popularity while Art & Design has seen a decline, though Art & Design had been relatively stable until 2015.

[4] 2003 was the first year in the period that only one version of Higher was sat. Between 2000 and 2002 both Highers and 'New' Highers were sat by candidates.

- Languages: German has declined gradually over the period, French began decline after 2016 and Spanish has increased, particularly after 2015.
- Computing: The Logan review highlighted the importance of education in developing the necessary skills for a Scottish technology ecosystem. It noted:

> "The more people we equip at school level with a basic level of competence in Computing Science, the more start-ups we'll eventually produce and the greater the pool of engineers we'll have available for those start-ups to hire from as they develop. In a country with a very small population such as ours, this point is of even greater importance.
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> "Against that starting point, our fundamental strategic error as a country is that we don't treat Computing Science in the same way as we do Mathematics or Physics. For that matter, we don't treat it with the same importance as History or Geography, for example, either."[5]

It is therefore worth noting the decline in Computing entries at both National 5 and Higher levels. Even just looking at the few years of only Nat 5s, there were 7,926 candidates (9.5% of all) in 2016 which had fallen to 6,344 (7.9%) by 2019. At Higher level candidates have fallen from 4,454 (6.5%) in 2016 to 3,228 (5.1%) in 2019.

[5] Scottish technology ecosystem: review - gov.scot (www.gov.scot)