Introduction

Use of the features of the subject profile tool provide a perfect research tool for examining In-School Variation and the differences in performance within a school that should be the subject of school intervention. The significance of In-School Variation is that, in most schools, differences in the performance of students within a single school significantly outweighs the performance differences between schools.

The most reliable analysis of the Subject Profile will be when we are looking at Summer exam results. However, the trends seen in teacher-estimated grades are of interest if they are tracked through the year. By doing this, a school can put interventions in place and see if the trends they are seeing are affected by the interventions.

What is In-School Variation?

In-School Variation is the variation in provision as experienced by different groups of learners. Inherently, ISV is a school effect which can affect the outcomes to learning for students. ISV can have a positive or negative influence upon learning effectiveness.

A DfE study based on 2003 data reported that, in value-added terms, in-school variation during Key Stage 2 (KS2) appeared to be five times greater than between-school variation. During KS3 the ratio was 11 times, and for KS4 was 14 times greater.

Ref: NCSL Closing the Gap

Understanding the Subject Profile

- The figures in the Subject Profile are based on grades in the current series only
- Numbers are reported in POINTS. For 9-1 qualifications, 1 grade = 1 point
- For a more detailed explanation of how to navigate and understand the Subject Profile, please see the video tutorial which can be accessed via the Subject Profile page

1. Subject Progress Data – The Subject Comparative Difference

Use the subject box to familiarise yourself with the basic figures relating to the subject.

Subject		
Title	All	Group
Entries	45	22
Residual	-0.25	-0.16
Variance	0.88	0.92
% 9 to 7	20	22.73
% 9 to 5	55.56	59.09
APS	4.82	4.95

- **How many entries? Beware of the effect that individual pupil performances can have on the averages within a small group**

- **What is the subject's overall residual? Are students on average doing better or worse in this subject than their overall APS?**

- **What is the distribution figure for the subject? We will be exploring this in more detail later.**

This box shows both the figures for the overall cohort and for the selected group (where a filter has been applied). It will be worth returning to later when exploring group effects.

2. The Green Line: Cohort Attainment

The shape of the green line indicates the cohort's attainment profile based on their APS. For example, the cohort in the top picture have a large proportion of high-attaining students – the average grade represented by the green line is above 6 for the majority of students. The cohort on the bottom have some high attaining students but only around 1/3 have an APS above 6.

> **What do you notice about the attainment profile of your cohort?**
>
> **Is this in line with your impressions of the year group?**

> **The top chart on the left shows a large proportion of high-attaining students. The green line is above 6 for the majority of students.**
>
> **The bottom chart shows some high attaining students, but only around 1/3 have an APS above 6.**

3. The X Axis: Academic Range

How spread out are your students along the x axis? This distribution shows you the attainment profile of the students taking your subject within their year group. Clustering towards the left means that your students are high overall performers (high overall APS) and conversely clustering towards the right means that they are low overall performers.

- **What do you notice about the attainment profile of the students taking your subject? How do they fit within the year group?**

- **If you have groupings set by ability, how do these groups sit on the X axis and what does this tell you about their ability in your subject compared to their overall attainment?**

4. Distribution

Distribution is the 'spread' of dots from the average. The Distribution figure in the subject box (depending on the version of 4Matix that you are using, this may also be referred to as "Variance") gives the average figure for the students in your subject cohort – remember that you can also see the figures for filtered groups to compare their distribution to the overall figure for the group.

- **Look at the dots on the graph. Are your pupil dots generally close to the green line, i.e. do students perform similarly in your subject compared with their average?**

- Low distribution (around 0.6 grades) indicates a tight relationship between teaching and learning.

- High distribution (>1.0 grades), suggests a wider range of outcomes in response to the same teaching. 4

The explanation could lie in exemplary teaching that we can learn from, or an area where students are dropping away from the levels of attainment they can achieve in other subjects.

Looking at whether subject residual is + or - is the starting point for deciding which it might be, and then looking further into an explanation by examining the performance of 'micro-groupings' or individuals.

5. Outliers: Individual Students

The highlighted pupil, Christian, is doing significantly less well in this subject than he is elsewhere. The chances are that you would be aware of this pupil and their difficulties but it's important to consider that, if they are meeting their targets, you may not have realised that something is affecting their outcomes in your subject that is not having the same effect in other subjects. This could be down to a SEND issue, a poor choice of option subjects or something as simple as the pupil being distracted by the person next to them on your seating plan. Individual outliers are always worthy of investigation and may reveal a pupil with potential for improved performance who may have fallen under the radar.
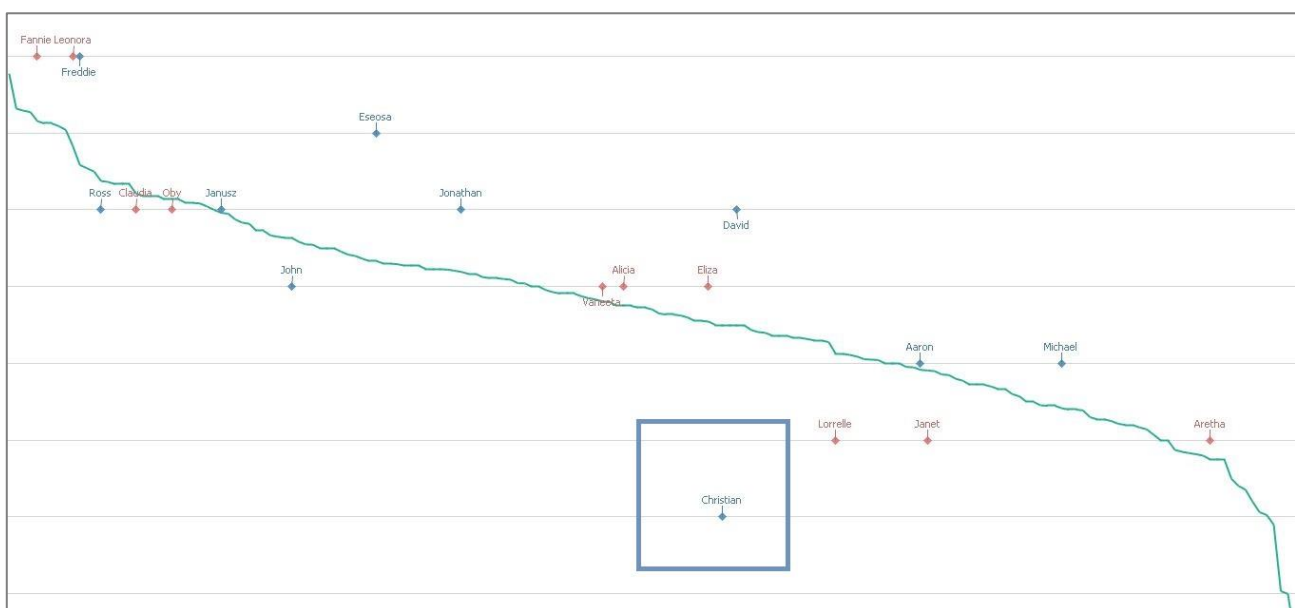
6. Looking for Patterns: Group Effects

Subject profiles are useful because we can form an initial hypothesis about the subject by looking at the pattern of dots for each subject.

- Where the dots are significantly clustered above the line it means that students are generally doing better in this subject than their average grade.

- Where the dots are significantly clustered below the line it means that students are generally doing worse in this subject than their average grade.
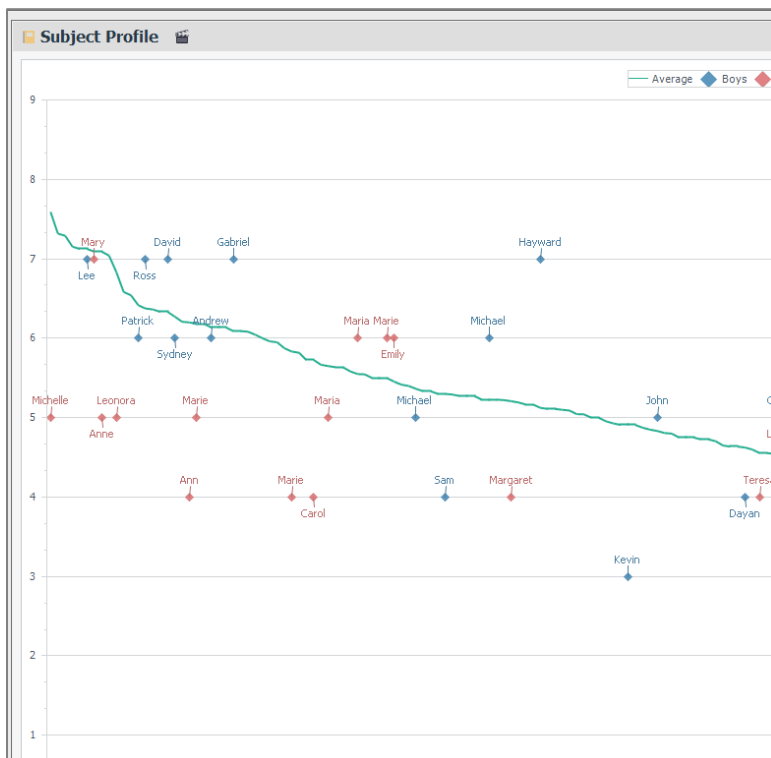
We can see if these affects are biased towards higher-attaining or lower-attaining students or if there are gender differences in how students perform in this subject.

Here we can clearly see that there is a group of higher-attaining girls who are doing less well in this subject than they are elsewhere. This is an issue worthy of further investigation.

7. Research Groups: Investigating In-School Variation

The Subject Profile tool is at its most useful when used with Research Groups.

If we can identify and highlight groups of students who have a different experience to other students, e.g. they attend a homework club, or they came from a particular primary school, or they had a Summer Birthday, we can observe this group across subjects using a Research Group.

Some examples of Research Groups being used by schools to investigate factors influencing students' performance:

Literacy Intervention Group	**St Michael's Primary**
Y9 Field Trip	**Resilience Workshop**
Persistent absentee	**No computer at home**
Parents do not attend Parents Evening	**Started Y9 or later**
Summer Born	**High non-verbal CAT score**
Breakfast Club	**Taught in portacabin classroom for Maths**

7. Research Groups: Investigating In-School Variation Cont./

In the Groups panel, choose Research Groups and click on the Residual heading to range the residual column from high to low, then from low to high; this indicates the order in which the research group are influencing students' performance in each subject.

Usually, the top three highest residual values will identify features of the subject or pupil support which have the largest effect in this subject.

Looking for group effects like this is a way to investigate In-School Variation using a research-based approach.

8. Further Questions to Explore

What group effects appear to be in evidence?

Are they evident across the year group? i.e. if you have several sets, do all sets show similar patterns? If you remove the group filter and look at all students taking the subject is the effect still evident?

Have similar group effects been noticed in this subject for other year groups?

Have similar group effects been noticed in this year group for other subjects?

What are suitable questions for us to explore in our school?

What things lie hidden in a school's data? In particular, what factors affect learners which may be unique to our school and are having a significant effect? Are we insufficiently curious that we will sit on our school's data and not seek to find out what it can reveal?

Wherever there is a group of students in a school that has had a different experience to other students, there is scope for checking to see if this experience has had a positive or negative affect upon their learning. We might find there is no effect, and this is evidence in itself.

If we know that taking students on a geography field trip in year 9 sensitised these students to doing well in geography, and that this effect showed up in their predicted grades in the subject during year 11, then this is something we would consider doing again.

It works for positive and negative influences. If we find that students have their main lesson on a Friday afternoon in an unpopular room, and this has a group effect on their performance, then we might wish to intervene with next year's group and make improvements to this room. The point here is that if an intervention is worth doing we should be able to see the evidence of it in order to justify doing it again.

From www.mikebostock.com